McMaster University Undergraduate Calendar 1989-1990

This Calendar covers the period from September 1989 to August 1990.

Arts and Science, Business, Engineering, Health Sciences, Humanities, Science and Social Sciences.

The University reserves the right to change information contained in this calendar, and, because of resource limitations, reserves the right to limit enrolment in or admission to any course or programme at any Level. The timetable which is published annually should be used to determine:

1. if a course is to be offered, and
2. the term in which a course is to be offered.

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Directory for Correspondence and Enquiries

Mailing Address: McMaster University
Hamilton, Ontario, L8S 4L8
Telephone: Area Code 416, Number 525-9140

The following is a list of University offices (with the appropriate postal code) and Administrative staff members that are most frequently called on. Other offices and services are described throughout the Calendar with their addresses and telephone numbers.

Admission to Undergraduate Studies
Associate Registrar (Liaison and Admissions): Ann McLaughlin
Admissions Officers: Edie Rochkin, Liz McCallum
Gilmour Hall, Room 120 L8S 4L8 extn. 4034, 4796

Health Sciences Admissions
Assistant Registrar (Health Sciences): Laurel Stuart
Health Sciences Centre, Room 1B7 L8S 4J9 extn. 2114

Student Liaison
Manager: Laurie Coffey
Liaison Officer: Jill Syvret
Gilmour Hall, Room 102 L8S 4L8 extn. 4787

Student Financial Aid
Director of Financial Aid and Scholarships: John Edwards
Hamilton Hall, Room 401 L8S 4K1 extn. 4319

Scholarships and Prizes
Academic Awards Officer: Olga Tynowski
Hamilton Hall, Room 401 L8S 4K1 extn. 4789

Transcripts and Records
Associate Registrar (Records): Jim Walker
Gilmour Hall, Room 108 L8S 4L8 extn. 4457

Examinations, Schedules and Reservations
Assistant Registrar (Schedules and Examinations): Stephen Siblock
Gilmour Hall, Room 107 L8S 4L8 extn. 4453

School of Graduate Studies
Gilmour Hall, Room 110 L8S 4L8 extn. 3679

Centre for Continuing Education
Commons Building, Room 116 L8S 4K1 extn. 4321

Arrangements for Disabled Persons
Co-ordinator for the Disabled: Tim Nolan
Gilmour Hall, Room 113B L8S 4L8 extn. 4339

Alumni Association
Alumni Memorial Building, Room 203 L8S 4K1 extn. 2604
Director of Alumni Advancement: Roger Trull
Chester New Hall, Room 111 L8S 4L9 extn. 3804

Dean of Student Affairs
Dean: Rudy Heinzl
Hamilton Hall, Room 312 L8S 4K1 extn. 4649

On-campus Housing (Residence)
Director of Residences: Ron Coyne
Admissions Co-ordinator: Susan Marks
Commons Building, Room 101 L8S 4K1 extn. 4223

Off-campus Housing
Wentworth House, Room 118 L8S 4K1 extn. 4086

Student Counselling Services
Director of Student Counselling Services: Dr. W. Wilkinson
Hamilton Hall, Room 302 L8S 4K1 extn. 4711

Employment Opportunities
Student Placement Office, Hamilton Hall,
Room 409 L8S 4K1 extn. 4253

Advice for Overseas Students
International Students' Advisor: Pat J. Fernando
Divinity College, Room 146 L8S 4K1 extn. 4748

Grievances
Secretary of the Senate: Joan Morris
Gilmour Hall, Room 104 L8S 4L8 extn. 4337

Ombudsman's Office
Ombudsman: Rick Russell
Hamilton Hall, Room 217 L8S 4K1 extn. 2003

For information and advice with respect to university regulations and services, and human rights procedures, see the *Student Services and Organizations* section of the Calendar.

Other Publications

UNDERGRADUATE STUDIES

Level I Handbook
Part-time Degree Studies Calendar
School of Social Work Booklet
McMaster Divinity College Calendar

The above publications are all available from the Office of the Registrar.

GRADUATE STUDIES

Calendar of the School of Graduate Studies, available from the School of Graduate Studies

Graduate Studies in Business (MBA and Ph.D. programmes), available from the Faculty of Business

Post-Graduate Medical Programme Calendar available from the Health Sciences Registry, in the Health Sciences Complex, Room 1B7.

Teaching departments that offer graduate studies also provide informational booklets about their programmes. These may be requested directly from the departments.

CERTIFICATE AND PROFESSIONAL STUDIES

Part-time Studies Calendar, which describes professional designations, certificate and correspondence programmes, available from the Centre for Continuing Education.

GENERAL INTEREST NON-CREDIT STUDIES

Brochures about non-credit programmes and special offerings are available from the Centre for Continuing Education

Using the Calendar

The information in this Calendar is arranged in the sequence most appropriate for use by a prospective or current student.

The first sections describe procedures and regulations that apply University-wide. These are *Sessional Dates, Application* and *Admission Procedures, Academic Regulations, Senate Policy Statements*, and *Financial Information*.

The next sections start with a summary of the various degree programmes offered by each Faculty, followed alphabetically by the sections the *Arts and Science Programme* and six Faculties: *Business, Engineering, Health Sciences, Humanities, Science* and *Social Sciences*. Each section describes specific Faculty regulations and the undergraduate degree programmes by department. The programme descriptions specify which courses and what academic standing is required in order to satisfy the University's requirements for awarding a Bachelor's degree.

After consulting the programmes, you will note that some courses are 'Required' and some are 'Electives'. To determine the prerequisite requirements you must meet in order to register for a specific course, you should then look at the section *Course Listings*. The course listing is presented alphabetically by subject and department.

At the back of the Calendar there are two sections of information about the University services, the libraries, residences, research laboratories, computing facilities, and student activities and organizations.

The next section *Undergraduate Academic Awards*, lists all the awards and scholarships offered to undergraduate students by McMaster University. The regulations governing these awards are also described.

Bursaries and loan funding is presented next under *Supplemenatary Student Financial Aid*.

To locate information about a specific subject, you should consult the *Index* at the back of the Calendar.

McMaster University

During 1987, McMaster University proudly celebrated one hundred years of active life in post secondary education, during which it grew to be one of the leading universities in Canada.

Named after Senator William McMaster, who bequeathed funds to endow a 'Christian school of learning', McMaster University grew out of educational work initiated by Baptists in central Canada as early as the 1830's. After its initial years in Toronto from 1887 to 1930, the University was moved to Hamilton and became non-denominational in 1957, although the historic Baptist connection continues through the separately incorporated McMaster Divinity College. Almost 12,000 full-time students attend McMaster University, 1,400 of whom are pursuing advanced degrees offered through the School of Graduate Studies. In addition, about 3,000 part-time students are registered in the Winter Session from September to April, and 2,500 in the Summer Session from May to August. The University also provides courses in centres located outside Hamilton, for which full credit is granted.

McMaster University is a medium-sized, full service university offering educational programmes through six Faculties. The extensive activity in research supported by over $40 million in grants and contracts means that there are first-class libraries and sophisticated facilities. Undergraduate teaching is conducted through the Faculties of Business, Engineering, Health Sciences, Humanities, Science, and Social Sciences, and the distinctive Arts and Science programme. The Schools of Physical Education and Athletics, and Social Work are part of the Faculty of Social Sciences.

The Faculty of Humanities offers programmes in Art, Art History, Classics (Greek, Latin and Classical Studies), Comparative Literature, Drama, English, French, History, Humanities, Modern Languages (German, Hispanic Studies, Italian, Russian), Modern Languages and Linguistics, Music, and Philosophy leading to B.A. degrees, as well as a Bachelor of Music degree. Students pursuing Honours degree programmes in Comparative Literature, French, German, Hispanic Studies, Italian or Linguistics may complete and receive credit for the third level of the programme in study at a university in a country whose language is being studied.

The Faculty of Social Sciences offers B.A. programmes in Anthropology, Economics, Geography, Gerontology, Labour Studies, Political Science, Psychology, Religious Studies and Sociology. The School of Social Work offers the combined B.A./B.S.W. degree, and the School of Physical Education and Athletics the B.P.E. degree.

Bachelor of Science programmes are available in the Faculty of Science at the B.Sc., B.Sc. Honours, and B.Sc. Major levels. Programmes are offered in Biochemistry, Biology, Chemistry, Computer Science, Geography, Geology, Health and Radiation Physics, Mathematics, Materials Science, Molecular Biology and Biotechnology, Physics, Psychology, and Statistics.

The Faculty of Health Sciences has gained an international reputation for its innovative educational programming, and offers through the School of Medicine the M.D. Programme, and through the School of Nursing offers the B.Sc.N. degree programme. The Bachelor of Health Sciences degree may be earned in Occupational Therapy or Physiotherapy.

The Faculty of Business offers the Honours B.Com., Honours B.Com. & Arts, and B.Com. degrees, which include work in the following areas: accounting, business policy, finance, management science and information systems, marketing and international business, and human resources and labour relations.

The Faculty of Engineering offers the Bachelor of Engineering programme in Ceramic Engineering, Chemical Engineering, Civil Engineering and Computer Systems, Civil Engineering and Engineering Mechanics, Computer Engineering, Electrical Engineering, Engineering Physics, Manufacturing Engineering, Materials Engineering, Mechanical Engineering and Metallurgical Engineering.

Students may register in the Faculty of Engineering to take the five-level Engineering and Management programme which is offered jointly by the Faculties of Business and Engineering.

Most of the 1000 members of the University faculty hold doctoral degrees in the areas of their specialization. Faculty members are expected to teach both graduate and undergraduate courses and may be involved in the academic counselling of students.

The diverse academic programmes of the University are supported by some fine, and even unique, facilities. The University Library is a member of the Association of Research Libraries and contains nearly 1.5 million volumes, and has subscriptions to over 14,000 periodical titles. The Library has an extensive special collections section which includes the Bertrand Russell Archives, 18th Century materials and major Canadian collections. Facilities for programmes in the Humanities include modern language laboratories, music rehearsal rooms, art studios, an art gallery and seminar rooms. The work of the Faculties of Science and Engineering is supported by sophisticated facilities which include a Nuclear Reactor and Van De Graaff Accelerator. Computing facilities include mainframes, terminal clusters, and microcomputers, and support academic and non-academic applications. The Faculty of Engineering has made special arrangements for students to lease-purchase microcomputers.

The recreation and intramural programmes offer more than 30 different sports in which over 5,000 students participate. The Intercollegiate Athletic Programme provides 17 sports for men and 15 for women. The athletic facilities include a 50-metre pool, a newly-surfaced 400 metre all-weather track as well as fully equipped laboratories for exercise, physiology and biomechanics.

The University is located on an attractive campus beside the Royal Botanical Gardens at the western end of Lake Ontario. The campus is reserved for pedestrian traffic. Residential accommodation on the campus is available for about 2,400 students and includes men's and women's residences as well as co-educational facilities.

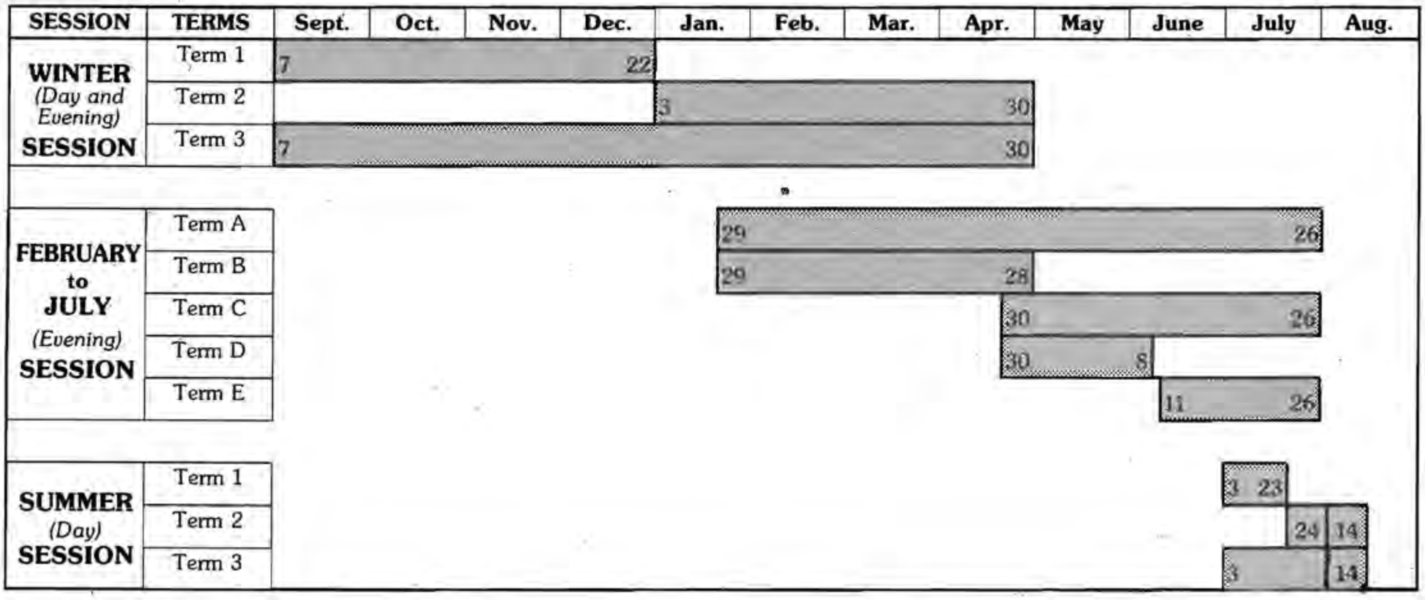
Access to downtown Hamilton and the activities that a major city has to offer is easy. As part of the extensive downtown redevelopment, new facilities, which support the cultural life of the city, have been constructed in recent years. These include an Art Gallery, a Convention Centre, Hamilton Place, an auditorium which seats over 2,400 persons and includes a studio theatre, and most recently a major arena, the Copps Colliseum. The public library includes teaching facilities, and a Downtown Information Centre operated jointly by McMaster University and Mohawk College.

Sessional Dates

For the purpose of teaching the academic year is divided into sessions as shown on the chart below.
The **Winter Session,** from September to April, is the session in which most undergraduate students register and classes are offered in both the day and the evening.
The **February to July (Evening) Session** offers courses at various times during the six-month period.
Summer (Day) Session starts at the beginning of July and ends in mid-August.
All **Application Deadlines** appear below the chart, as well as the dates for the **McMaster Test of Writing Competence.**

The 1989-90 Academic Year Divided by Session and Term

*The number in the bottom left corner of each block is the **start date** for that term.*
*The number in the bottom right corner of each block is the **end date** of that term, including the examination period.*



APPLICATION DEADLINES

(See also the section *Application Procedures)*

Winter Session – September Entry

Medicine	November 1
Nursing (other than Grade 13/OAC)	February 15
Social Work	March 1
Occupational Therapy/Physiotherapy	April 1
Labour Studies	April 15
Gerontology	April 15
Nursing (Grade 13/OAC)	May 1
All other undergraduate programmes	August 15

Winter Session – January Entry

All eligible programmes	November 30

February to July Session

February entry	January 10
May entry	April 15
June entry	May 31

Summer Day Session

All eligible programmes	May 31

McMASTER TEST OF WRITING COMPETENCE

The McMaster Test of Writing Competence will be held on the following dates (tentative).

Friday August 11 and Saturday August 12, 1989
Saturday September 9, 1989
Monday December 18, 1989
Wednesday April 11, 1990

CONVOCATIONS

Last day to file a Graduation Information Card for Autumn 1989 Convocation	Friday September 8
Autumn 1989 Convocation (all Faculties)	Friday November 10
Last day for changing Programme for Spring 1990 Convocations	Friday, February 9
Last day to file a Graduation Information Card for Spring 1990 Convocations	Thursday February 15
Health Sciences Convocation 1990	Friday, May 11.
Spring Convocations 1990	Thursday May 31 to Saturday June 2
Last day to file a Graduation Information Card for Autumn 1990 Convocation	Friday September 7
Autumn 1990 Convocation (all Faculties)	Friday November 9

WINTER SESSION 1989 – 1990 (DAY and EVENING)

The following schedule applies to both full- **and** part-time students.

	Term 1	Term 2	Term 3
Level I Early Registration	⟨—— Friday August 11 and Saturday August 12 ——⟩		
Registration (all Levels)	⟨—— Friday Sept. 1, Tuesday Sept. 5, Wednesday Sept. 6 ——⟩		
Classes begin	Thursday September 7	Wednesday January 3	Thursday September 7
Last day for registration and adding courses	Wednesday September 20	Friday January 12	Wednesday September 20
Last day to withdraw without failure by default	Friday October 13	Friday February 9	Friday February 9
Thanksgiving – no classes	Monday October 9	—	Monday October 9
Mid-term recess	—	Mon. Feb. 19 to Sat. Feb. 24	Mon. Feb. 19 to Sat. Feb. 24
Good Friday – No classes	—	Friday April 13	Friday April 13
Examination ban – no tests or examinations may be held during class time	Thurs. Nov. 30 to Fri. Dec. 8	Wed. April 4 to Wed. April 11	Wed. April 4 to Wed. April 11
Classes end	Wednesday December 6	Tuesday April 10	Tuesday April 10
Winter Session Examinations			
Mid-Session Tests (Level I Courses)	—	—	Sat. Dec. 9 to Fri. Dec. 22
Final Examinations	Sat. Dec. 9 to Fri. Dec. 22	Thur. Apr. 12 to Mon. Apr. 30	Thur. Apr. 12 to Mon. Apr. 30
Deferred Examinations			
Last day to confirm intent to write deferred exams from Winter Session 89/90	Friday February 9, 1990	Friday June 29, 1990	Friday June 29, 1990
Deferred exams from Winter Session 89/90	Thur. Apr. 12 to Mon. Apr. 30	Mon. July 23 to Thur. July 26	Mon. July 23 to Thur. July 26

FEBRUARY TO JULY (EVENING) SESSION 1990

	Term A 6-unit courses 1 night per week	Term B 3-unit courses 1 night per week	Term C 6-unit crs, 2 nights/wk. 3-unit crs, 1 night/wk.	Term D 3-unit courses 2 nights per week	Term E 3-unit courses 2 nights per week
Classes begin	Mon. Jan. 29	Mon. Jan. 29	Mon. April 30	Mon. April 30	Mon. June 11
Last day for registration and adding courses	Fri. Feb. 9	Fri. Feb 9	Fri. May 4	Wed. May 2	Wed. June 13
Last day to withdraw without failure by default	Fri. May 18	Fri. March 16	Fri. June 29	Fri. May 18	Fri. June 29
Mid-term recess	Mon. Feb. 19 to Sat. Feb. 24	Mon. Feb 19 to Sat. Feb. 24	—	—	—
Good Friday – no classes	Fri. April 13	Fri. April 13	—	—	—
Victoria Day – no classes	Mon. May 21	—	Mon. May 21	Mon. May 21	—
Canada Day (July 1) – no classes	Mon. July 2	—	Mon. July 2	—	Mon. July 2
Classes end	Fri. July 20	Fri. April 27	Fri. July 20	Fri. June 8	Fri. July 20
Examinations	Mon. July 23 to Thur. July 26	Fri. April 27 to Sat. April 28	Mon. July 23 to Thur. July 26	By instructor	Mon. July 23 to Thur. July 26
Last day to confirm intent to write deferred exams.	Thurs. Oct. 26	Fri. June 29	Thurs. Oct. 26	Thurs. Oct. 26	Thurs. Oct. 26
Deferred examinations	Fri. Dec. 7 to Thurs. Dec. 20	Mon. July 23 to Thur. July 26	Fri. Dec. 7 to Thurs. Dec. 20	Fri. Dec. 7 to Thurs. Dec. 20	Fri. Dec. 7 to Thurs. Dec. 20

SUMMER (DAY) SESSION 1990

	Term 1 3-unit courses 3 hours, daily	Term 2 3-unit courses 3 hours, daily	Term 3 6-unit courses 3 hours, daily
Classes begin	Tuesday July 3	Tuesday July 24	Tuesday July 3
Last day for registration and adding courses	Wednesday July 4	Wednesday July 25	Wednesday July 4
Last day to withdraw without failure by default	Monday July 9	Monday July 30	Monday July 30
Civic Holiday – no classes	—	Monday August 6	Monday August 6
Classes end	Monday July 23	Tuesday August 14	Tuesday August 14
Examinations	⟨—— Last day or as arranged by instructor ——⟩		
Last day to confirm intent to write deferred examinations	Friday October 26	Friday October 26	Friday October 26
Deferred examinations	Friday December 7 to Thursday December 20	Friday December 7 to Thursday December 20	Friday December 7 to Thursday December 20

Application Procedures

PROGRAMMES ENTERED IN LEVEL I

McMaster University has the following Level I programmes: Arts and Science I, Business I, Engineering I, Humanities I, Music I, Nursing I, Physical Education I, Natural Sciences I and Social Sciences I.

DEADLINES

A complete application comprises: an application form; all relevant transcripts; and any other documentation stipulated in the *Admission Requirements* section and the specific Faculty sections of this Calendar, or in letters from the appropriate Faculty or the Registrar's Office.

Most of the programmes have limited admission and may be full before the deadlines given below. *The University reserves the right, therefore, not to accept applications submitted after a programme is full and you are advised to* ***submit your application well in advance of the deadlines given on page 4, Sessional Dates.***

ENQUIRIES

The *Directory for Correspondence and Enquiries* on page 2 of this Calendar, provides a list of University offices and Administrative staff members to whom you may direct specific queries.

FORMER MCMASTER STUDENTS

If you have previously registered at McMaster, but did not attend last year, you should communicate with the Associate Dean (Studies) of the appropriate Faculty. *If you are intending to return to the Faculty of Business or Science, this communication is a requirement.* You may be required to write a letter in order to seek readmission, unless five years have passed since your last registration.

If five years have passed since you last registered at McMaster, you will be required to follow the current regulations and curriculum. You must obtain and complete an application form from the Admissions Office (Gilmour Hall, Room 120, telephone (416) 525-9140 extension 4796). Your application will be considered by the appropriate Faculty committee.

APPLICANTS WITH DISABILITIES

The University encourages disabled persons to apply for admission to its programmes. All students are expected to satisfy the normal requirements for courses and programmes (including final examinations), although the Associate Deans (Studies) may authorize special arrangements to assist students to complete assignments, tests and examinations. Some programmes may include requirements which cannot be met by some people. Nevertheless in selected programmes an adapted course of study may be prescribed by the Associate Dean (Studies) on behalf of the Faculty following discussion with the student. Although there are many obstacles to overcome, experience has shown that students with various disabilities have been able to complete a variety of programmes at McMaster.

Applicants with disabilities are encouraged to contact the Co-ordinator for the Disabled, (Office of the Registrar, Gilmour Hall Room 113B, telephone(416) 525-9140 extension 4339) who will discuss their programmes of study and other aspects of university life, and will identify the faculty advisers to whom they should speak. Information on sources of financial assistance is also available.

A student of McMaster who incurs a permanent or temporary disability while enrolled at McMaster should consult the Associate Dean (Studies) of his or her Faculty to consider whether or not special arrangements can be made to enable that student to continue the course of studies in which he or she is enrolled.

ACADEMIC COUNSELLING FOR THOSE OFFERED ADMISSION

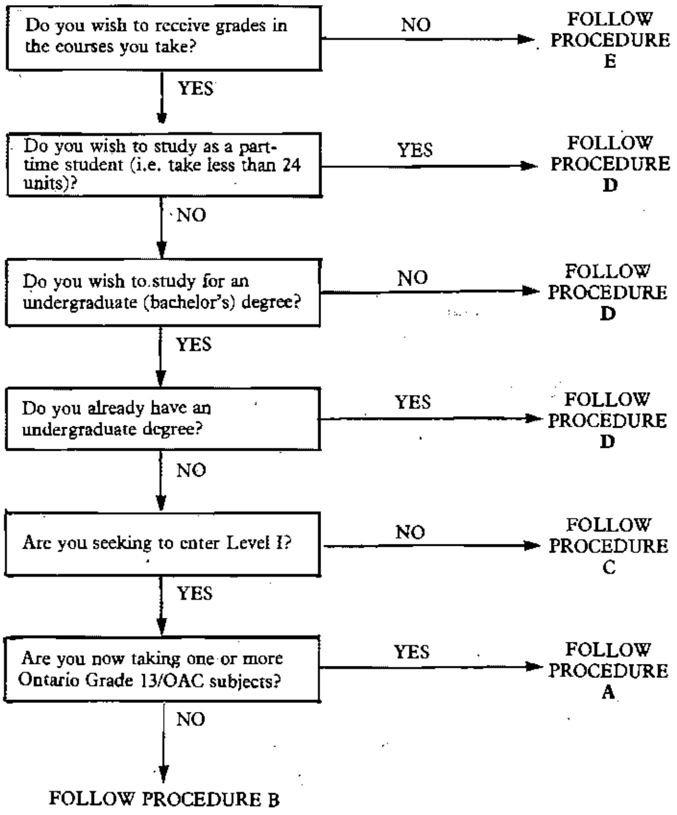
If you are offered **admission to Level I**, you will be asked to confirm that you have accepted the offer of admission and will attend the University. When we receive your acceptance of our offer, we shall send you a Registration Kit with information about the University, academic counselling and registration procedures.

Each Faculty also makes arrangements for students to visit the University and meet with a Faculty advisor to set up their programmes. Though attendance at the summer counselling and registration sessions is not compulsory, you are strongly advised to do so. If you cannot attend one of these sessions, counselling will be provided at the time of September registration.

If you are offered **admission above Level I**, you may contact the Office of the Associate Dean (Studies) of the Faculty offering the programme, or the Office of the Director of the programme, for academic counselling as soon as you are admitted.

APPLICATION PROCEDURES

The application procedures differ according to your current academic qualifications and your ultimate goals. You may determine the procedure you have to use by answering each of the questions below in sequence until you are directed to the procedure you must follow.


Do you wish to receive grades in the courses you take?
NO
FOLLOW PROCEDURE E
YES
Do you wish to study as a part-time student (i.e. take less than 24 units)?
YES
FOLLOW PROCEDURE D
NO
Do you wish to study for an undergraduate (bachelor's) degree?
NO
FOLLOW PROCEDURE D
YES
Do you already have an undergraduate degree?
YES
FOLLOW PROCEDURE D
NO
Are you seeking to enter Level I?
NO
FOLLOW PROCEDURE C
YES
Are you now taking one or more Ontario Grade 13/OAC subjects?
YES
FOLLOW PROCEDURE A
NO
FOLLOW PROCEDURE B

TELEPHONE NUMBERS

Locally, please call (416) 525-9140, extension 4796.
In Ontario, Quebec and Atlantic Canada, please call toll-free 1-800-263-2150.
In Western Canada, please call collect 0-416-525-9555.

PROCEDURE A:

This procedure applies to applicants who are now taking one or more **Ontario Academic Courses (OACs) or Ontario Grade 13** subjects in day school and wish to enter a **full-time** degree programme.

Application forms (**OUAC 101**) are available from your guidance office. You should choose one of the following programmes and complete the form:

PROGRAMME	**OUAC PROGRAMME CODE**
Arts and Science I (SpecialProgramme)	MX
Business I	MB
Engineering I	ME
Humanities I	MH
Music I	MM
Natural Sciences I	MS
Nursing I	MN
Physical Education I	MR
Social Sciences I	ML

Send the form and the application fee to the Application Centre. We acknowledge every application.

PROCEDURE B:

This procedure applies to applicants who wish to enter Level I of a **full-time degree** programme, **but** who are **not now** taking one or more **Ontario Academic Courses (OACs) or Ontario Grade 13 subjects** in day school.

It also applies to all **out-of-province** applicants who wish to enter Level I of a **full-time** degree programme.

Obtain an application form (**OUAC 105**) from the Admissions Office (Gilmour Hall, Room 120, or telephone. The numbers are given on page 6). You should choose one of the following programmes and complete the form:

PROGRAMME	**OUAC PROGRAMME CODE**
Arts and Science I (Special Programme)	MX
Business I	MB
Engineering I	ME
Humanities I	MH
Music I	MM
Natural Sciences I	MS
Nursing I	MN
Physical Education I	MR
Social Sciences I	ML

Send the form and the application fee to the Application Centre.

You should provide transcripts of marks and/or certificates from any secondary school or post-secondary institution you have attended.

Students who are attending, or have attended, secondary school in another province may have to obtain the transcript of secondary school marks from the Ministry or Department of Education for that province.

If you:

1. do not have the required Ontario Grade 13/OAC standing or its equivalent; and
2. will be 21 or older in the calendar year in which you plan to start your University courses; and
3. have not attended secondary school as a full-time student for at least two years,

you may qualify for entry as a **Special Student**. If so, write to the Admissions Office, Gilmour Hall, Room 120, or telephone. (The numbers are given on page 6.)

PROCEDURE C:

This procedure applies to applicants who seek to enter a **full-time** degree programme **above Level I**.

Obtain an application form (**OUAC 105**) from the Admissions Office, Gilmour Hall, Room 120, or telephone. (The numbers are given on page 6.)

You should choose one of the degree programmes listed in this calendar, and complete the form. Send the form and the application fee to the Application Centre.

PROCEDURE D:

This procedure applies to applicants who wish to enter as:

1. **part-time** students; or
2. **non-degree** students (Occasional, Continuing, or Post-Degree); or
3. students taking work for **credit at another university**; or
4. **second-degree** candidates.

All those listed, *except* Post-Degree applicants, must obtain a McMaster application form from the Admissions Office, Gilmour Hall, Room 120, or telephone. (The numbers are given on page 6.) You will be provided with more information on application procedures at that time.

Post-Degree applicants must obtain the appropriate application from the Graduate Studies Office, Gilmour Hall, Room 110.

PROCEDURE E:

This procedure applies to applicants who wish to register as **Listeners**. Listeners may attend classes, but do not write assignments or examinations. A Listener does not receive a grade for the course.

In order to register as a Listener, write, visit or telephone the Centre for Continuing Education, Commons Building, Room 116, (416) 525-9140, extension 4757.

PROGRAMMES ENTERED ABOVE LEVEL I

Medicine and **Nursing** (for holders of the Diploma R.N.): If you wish to apply to any of these programmes, refer to the *Faculty of Health Sciences* section of this Calendar. You should obtain the appropriate application form and make any enquiries at the Health Sciences Registry, McMaster University Medical Centre, Room 1B7, or telephone.(416) 525-9140, extension 2114.

Medicine commences after three years of undergraduate study.

Occupational Therapy and Physiotherapy: Entry is at Level IV for those who have completed a diploma programme at Mohawk College, or its equivalent. You should obtain an application form from the Admissions Office, Gilmour Hall, Room 120, or telephone. (The numbers are given in on page 6.)

Social Work: The level of entry for Social Work is Level II. Admission to the Combined B.A. and Social Work Programme is by selection of the applicants who have completed, or are completing, 30 units of work including Psychology 1A06 and Sociology 1A06 and normally with a University Average of at least 6.0.

Students, **enrolled at McMaster,** who are interested should apply directly to the School of Social Work prior to March 1.

Students wishing to apply for **transfer from another university** are required to complete a Two-Tier Application procedure. This is explained in the section *Faculty of Social Sciences, School of Social Work* in this calendar. Application must be made in sufficient time to guarantee further consideration beyond the March 1 deadline.

Admission Requirements

The University reserves the right to change any information contained in this section at any time without notice.

The University Senate has limited enrolment in most programmes so that admission is by selection. This means, therefore, that possession of the minimum admission requirements does not guarantee admission.

Admission from Ontario Secondary Schools

We know that experimental programmes are offered in some Ontario secondary schools and welcome applicants from these programmes. If you are such an applicant and do not meet exactly the subject requirements outlined below, you should write to the Associate Registrar (Liaison and Admissions) who will ensure that your application is carefully considered.

At the time of writing, Grade 13 courses are being phased out and being replaced by Ontario Academic Courses (OACs). During the transition period we shall treat the two sets of courses as equivalent. The requirements below are written in terms of OACs for which Grade 13 courses may generally be substituted.

EARLY ADMISSION FROM ONTARIO SECONDARY SCHOOLS

Early admission is granted annually in June on a date agreed upon by all Ontario universities. Early Admission is based on interim marks supplied by secondary schools in April and may be granted to an applicant who expects to acquire final standing later in the year.

If you are granted Early Admission, you must subsequently complete successfully six Ontario Academic Courses (OACs), or six Grade 13 subjects, including all required subjects. During the period OACs are being introduced, appropriate combinations of OAC credits and Grade 13 subjects, to total six, will be acceptable. In addition, you will be expected to meet the minimum average required for your programme. The University reserves the right to withdraw offers of admission to those applicants who do not meet the minimum average prescribed for the programme using the final marks. Final marks are reported to the University for students registered in OACs, but applicants may submit such marks directly to the Associate Registrar (Liaison and Admissions).

If you have final standing in each of the OACs required to enter the McMaster University programme you have chosen, you may be granted Final Admission.

ADMISSION FROM ONTARIO SECONDARY SCHOOLS

To be considered for admission you must satisfy not only the general requirements of the University, but also the subject requirements for the specific programme you wish to enter.

For an applicant from an Ontario secondary school there are *three* requirements:

1. the Ontario Secondary School Diploma or the Secondary School Honour Graduation Diploma with acceptable standing; and
2. a 'weighted average' in the OACs completed which is above the minimum specified by each programme; and
3. satisfactory completion of the subject requirements for the appropriate programme.

The 'weighted average' is computed as in the example below. (Credit values are assigned by the Ministry of Education; we have used fractional credits to demonstrate what a 'weighted average' is.)

Subject	Mark	Credits	Marks × Credits
Subject A	66	1.0	66
Subject B	70	1.0	70
Subject C	80	1.5	120
Subject D	56	0.5	28
Subject E	72	1.0	72
Subject F	60	1.0	60
Total		6.0	416

'Weighted average' = 416 ÷ 6 = 69.3%.

Grade 13 or OAC Music is acceptable as a credit and the mark obtained is included in the average for admission. Alternatively, the applicant may submit certificates from a recognized conservatory of music in Grade 4 theory, or in Grade 9 practical and Grade 3 theory. Marks supplied by *any* acceptable Conservatory of Music may be used to determine the average for admission.

Subject Requirements for Specific Level I Programmes

In view of the changes that are occurring in Ontario secondary school curricula, we shall in the interim accept Ontario Academic Courses (OACs) and Grade 13 courses equally. We shall treat graduates of four and five year programmes under the new curriculum equally.

ARTS AND SCIENCE I (Special programme)

Enrolment in the Arts and Science Programme is limited and admission is by selection. Candidates may be interviewed. Students applying from Ontario secondary schools must have:

1. One OAC English.
2. OAC Calculus.
3. Completion of additional OACs to total six credits with a weighted average of at least 75.0%. At least three of the additional OACs must be selected from among English, français, other languages, Algebra and Geometry, Finite Mathematics, Biology, Chemistry, Physics, Geography, History, and Music.

In recent years, all students offered admission to the Arts and Science Programme had a Grade 13 admission average of 80% or higher.

Candidates without these qualifications who nevertheless provide evidence of unusual promise will also be considered.

Students from colleges, other universities, and other provinces are invited to apply. Each case will be considered on its individual merit.

Students Presenting Grade 13 Courses

Grade 13 courses in Algebra and in Relations and Functions will be accepted in Group 3 above.

BUSINESS I

Enrolment in Business I is limited and admission is by selection. The specific percentage required for admission varies from year to year. The following are the minimum requirements for consideration.

1. One of OAC Calculus, OAC Finite Mathematics or OAC Algebra and Geometry. Calculus or OAC Finite Mathematics is preferred.
2. One OAC English.
3. At least three additional OACs selected from among English, français, other languages, Calculus, Algebra and Geometry, Biology, Chemistry, Physics, Geography, History, Music, Accounting and Economics.
4. Additional OACs to total six credits with a minimum overall average of 70.0%.

Although the stated minimum is 70.0%, in recent years an average in the mid-70's has been required for an offer of Early Admission in June.

Students Presenting Grade 13 Courses

Grade 13 courses in Algebra and in Relations and Functions may be used in Groups 1 and 3 above, but only one of the OAC Algebra and Geometry and Grade 13 Algebra may be used.

ENGINEERING I

Enrolment in Engineering I is limited and admission is by selection. The following are the minimum requirements.

Six OACs with an average of at least 75.0% must be presented, and these must include English, Calculus, Algebra and Geometry, Chemistry, and Physics with an average of at least 75.0% in these five subjects.

As a general policy, applicants from Ontario Colleges of Applied Arts and Technology who have achieved a first-class honours standing in the last two years of a three-year technology programme will be considered for admission to the second level of a relevant Engineering programme.

Students Presenting Grade 13 Courses.

1. An overall weighted average of at least 75.0% in the six credits offered including
2. A weighted average of at least 75.0% in the following five Grade 13 credits: Calculus, Algebra, Functions and Relations, Physics, and Chemistry.

Applicants presenting a **mixture** of Grade 13 subjects and OACs, may substitute Grade 13 courses in Calculus, Chemistry, and Physics for the OACs. An applicant presenting the OAC in Algebra and Geometry must also present English; a student presenting Grade 13 would have to present Algebra, and Relations and Functions. Other mixtures of Grade 13/OAC credits which satisfy the minimum requirements will also be considered on an individual basis.

HUMANITIES I

Admission to Humanities I is by selection and a minimum overall average of 70.0% on six OACs is required. Required:

1. One of: OAC English I, anglais I or II, or français I with a grade of at least 65.0%, and
2. 5 additional OACs.

The Faculty of Humanities strongly recommends that students select at least one OAC from Humanities subjects (Art, Drama, English, French, français, other languages, History and Music) in addition to Requirement 1. above.

Candidates without these qualifications who nevertheless provide evidence of equivalent promise will be considered.

For students entering McMaster in 1990, no more than two OACs in any one subject will be accepted.

Art 1F06: If you intend to take Art 1F06, you must present a *portfolio*, *by the end of April*, and be interviewed by the Department of Art and Art History. The portfolio should contain a variety of original works in different media including works derived from both first hand observation and the imagination. During the interview students *may* be asked to do some drawing as an additional means of demonstrating their skills and interests. Late applications *may* be considered if places are available in the class.

MUSIC I

The academic requirements are the same as for **Humanities I**. In addition, applicants to Music I or to the B.A. in Music must successfully complete a music audition/examination consisting of:

1. demonstration of technique (approximately Grade 9 level of the Royal Conservatory of Music, Toronto);
2. performance (approximately 20 minutes' duration) of two or three varied pieces of the candidate's choice (approximately Grade 9 level), including at least one from the 20th century;
3. ear test appropriate to the Grade 9 performance level;
4. written examination on rudiments of theory (Grade 2 level);
5. interview.

Those applying for Music I must make arrangements with the Department of Music for the audition.

NATURAL SCIENCES I

Admission to Natural Sciences I is by selection, and the specific percentage required for admission varies from year to year. Students with a weighted OAC average of 75.0% or better have a good chance of success in science programmes and will be given priority. The following are the minimum requirements for consideration, in 1988 and 1989.

1. OAC Calculus.
2. One of OAC Physics, OAC Algebra and Geometry.
3. One of OAC Biology, OAC Chemistry, OAC Algebra and Geometry.
4. A weighted average acceptable to the Faculty in Calculus and the two additional credits specified above. (In the last five years, an average of at least 70.0% has been required.)
5. Additional OACs to total six credits.

The Faculty of Science *strongly recommends* that students present at least one of OAC Biology, OAC Chemistry, or OAC Physics when meeting the above requirements.

Additional Mathematics: OAC Algebra and Geometry is also desirable.

Although an OAC English is not required for admission, a very large proportion of students entering Natural Sciences I have taken it. We strongly urge all prospective students to take OAC English I.

Students presenting Grade 13 Courses

Grade 13 courses in Algebra and in Relations and Functions may be used in Groups 2, 3, 4, or 5 above.

Please note that **changes commencing 1991** are being considered by the Faculty of Science.

NURSING I

Admission is by selection. Possession of the minimum requirements does not guarantee admission. Normally there are ten times as many applicants as there are places in the programmes. Only those applicants who offer high academic standing are selected. Required:

1. Year 4 Mathematics (Advanced level).
2. OAC Chemistry *and* OAC English.
3. OAC in *one of* Mathematics, Biology, Physics.
4. Additional OACs (within two years prior to application) to total six credits. At least two of the additional OACs must be selected from français, other languages, Calculus, Algebra and Geometry, Finite Mathematics, Biology, Physics, Geography, History and Music.

Health requirements for admission: Before registration, students must file information pertaining to their state of health and immunization with the University. Detailed instructions will be provided upon acceptance into the programme.

Deadlines: *OAC/Grade 13 applications* must be postmarked no later than **May 1** in the year in which study is to commence. *Non-OAC/Grade 13* applications (as described in the Section *Faculty of Health Sciences, School of Nursing*) must be postmarked no later than **February 15** in the year in which study is to commence.

Students presenting Grade 13 Courses

Grade 13 couses in Algebra and in Relations and Functions may be used in Groups 3 and 4 above.

PHYSICAL EDUCATION I

Admission to this programme is by selection; the minimum requirements will not guarantee admission. A minimum average of 70.0% (to be computed on the basis of the six highest marks achieved in OACs) will probably be required. Required:

1. One OAC English.
2. One of OAC Algebra and Geometry, OAC Calculus, OAC Finite Mathematics.
3. Additional OACs to total six credits.

It is strongly recommended that one of Biology, Chemistry, or Physics be included by potential applicants in their OACs.

Candidates without these qualifications who nevertheless provide evidence of equivalent promise will be considered.

Students presenting Grade 13 Courses

Grade 13 courses in Algebra and in Relations and Functions may be used in place of Algebra and Geometry in Group 2 above.

SOCIAL SCIENCES I

Admission to **Social Sciences I** is by selection and a minimum average of 70.0% (to be computed on the basis of the six highest marks achieved in OACs) will probably be required. Required:

1. One OAC English.
2. One of OAC Algebra and Geometry, OAC Calculus, OAC Finite Mathematics.
3. Additional OACs to total six credits.

Candidates without these qualifications who nevertheless provide evidence of equivalent promise will be considered.

Students presenting Grade 13 Courses

Grade 13 courses in Algebra and in Relations and Functions may be used in place of Algebra and Geometry in Group 2 above.

School of Social Work

Admission to the *School of Social Work* in Level II requires successful completion of any Level I programme, including Psychology 1A06 and Sociology 1A06. Criteria include an average of at least 6.0 at the end of Level I, and personal suitability. Applicants currently enrolled at McMaster University must make aplication *prior* to March 1 directly to the School of Social Work.

Applicants transferring from another university should consult *Two-tier Applications* in the section *Faculty of Social Sciences, School of Social Work.*

PROGRAMME TRANSFER AFTER ADMISSION

If you have been admitted to one programme and subsequently wish to transfer to another, you may be able to do so, provided you have met the subject requirements for the second programme and a place is available. If you wish to make such a transfer, consult the Admissions Office.

Admission With Other Qualifications

A. ADMISSION FROM ONTARIO COLLEGES OF APPLIED ARTS AND TECHNOLOGY

Applicants from Colleges of Applied Arts and Technology who have completed at least one year of work, are invited to apply for admission. Each case will be considered individually on its merits and the programme desired. Advanced credit will normally be given to well-qualified students who have completed at least two years of work.

In the granting of credit attention will be given to:

1. the applicant's performance in the college programme;
2. the duration of the previous programme;
3. the programme taken at the college and the programme to which entry is sought;
4. the applicant's secondary school record.

Normally the credit will be at least one Level for a well-qualified graduate of a three-year programme, and at least 12 units for an applicant who has completed two years and performed well, provided the college work is appropriate for the university programme to which entry is sought.

Credit beyond this may be given on an individual basis where the college and university programmes are in similar areas, and where the applicant's academic record and background warrant special consideration.

B. ADMISSION FROM RYERSON POLYTECHNICAL INSTITUTE

In determining admissibility and the possibility of advance credit, due consideration is given to the admission requirements of the Ryerson programme, its length of study and nature (i.e. certificate, diploma or degree), standing in the programme and studies desired at university level. Students with high standing after one or two years of study are invited to apply.

Every application is dealt with individually so that appropriate academic credit may be granted where warranted.

C. ADMISSION FROM REDEEMER COLLEGE

For admission to McMaster University a student must present, with an appropriate average, six Year 1 courses from Redeemer College which are appropriate for the McMaster programme. Redeemer College courses in the 110-119 series are treated as equivalent to OACs for purposes of admission. Students who wish advanced credit for work completed at Redeemer College must write an examination set by McMaster for each course in which credit is sought.

D. ADMISSION FROM OTHER CANADIAN PROVINCES

We welcome applications from students from other Canadian provinces. They must meet the following minimum requirements and present subjects appropriate for the programmes as described above under *Subject Requirements for Specific Level I Programmes*. For clarification, applicants are invited to contact the office of Student Liason.

Province	Qualifications Required
Alberta	Grade 12
British Columbia	Grade 12
Manitoba	Grade 12
New Brunswick	Grade 12
Newfoundland and Labrador	Year I Memorial University of Newfoundland
Northwest Territories	Grade 12
Nova Scotia	Grade 12
Prince Edward Island	Year I University of Prince Edward Island
Quebec	Year I CEGEP (General Course)
Saskatchewan	Grade 12

E. ADMISSION FROM OTHER COUNTRIES

We have, for convenience, indicated our admission requirements for applicants from selected countries.

Students from other countries should send official matriculation certificates well in advance of the session. The equivalent of first-class standing may be required for some limited enrolment programmes. Clear photocopies of certificates in a language other than English should be accompanied by notarized English translations. Clear photocopies of English language certificates must be notarized. Each applicant is considered on an individual basis. Applicants are strongly advised not to come to the University until they have been informed of their acceptance.

Applicants whose native language is not English and who have not resided in an English-speaking country for four years will be required to obtain standing satisfactory to the University in the Michigan English Language Assessment Battery (MELAB). The MELAB authorization form will be sent upon receipt of a formal application for admission. If the Test of English as a Foreign Language (TOEFL) has already been written, its results may be submitted in place of the MELAB results.

Applicants from **Great Britain and the West Indies** require:

1. five G.C.E. subjects at least two of which must be at the Advanced Level;
2. Advanced Level subjects appropriate for the programme desired, (refer above to *Subject Requirements for Specific Level 1 Programmes*);
3. an average of at least 'C' in the two Advanced Level subjects for non-limited enrolment programmes.

Applicants from **Hong Kong** require:

1. five subjects in the G.C.E. or University of Hong Kong Matriculation, at least two of which must be at the Advanced Level;
2. Advanced Level subjects appropriate for the programme desired, (refer above to *Subject Requirements for Specific Level 1 Programmes*);
3. an average of at least 'C' in the two Advanced Level subjects for non-limited enrolment programmes.
4. standing satisfactory to McMaster University in the Michigan English Language Assessment Battery (MELAB). Details of the test will be sent upon receipt of a formal application for admission.

Applicants from the **United States of America** should be students with high standing from Grade 12 of an accredited high school in the U.S.A. Normally high standing will have been demonstrated by 'A' standing, or scores of 600 or better in CEEB achievement examinations, or appropriate scores in the CLEP examinations. Students who do not meet these requirements may qualify for admission by completing one year of college-level work with standing acceptable to the University.

F. SPECIAL STUDENTS (MATURE STUDENTS)

Applicants who have attended university are **not** admissible as special students.

Full-time Study: If you do not meet the normal admission requirements described above in *Admission from Ontario Secondary Schools*, you may be admitted *on university probation* to full-time study provided you satisfy all of the following three conditions:

1. you are at least 21 years old or will be in the calendar year in which you propose to start; and
2. you have not attended secondary school on a full-time basis for at least two years; and
3. you obtain a satisfactory standing on a scholastic aptitude test (held in May, June, August and January) and are considered qualified by the appropriate Faculty Admissions Committee.

The writing of the test will be waived for those who have satisfactorily completed a certificate programme or professional designation at McMaster University or the equivalent (see *K. Graduates of McMaster Certificate Programmes* below). Information concerning the deadline for final application and other details may be obtained from the Associate Registrar (Liaison and Admissions).

A student who has been admitted in this manner may, nevertheless, choose to study on a part-time basis; he or she would be *on university probation* and follow the normal academic regulations.

Part-time Study: If you do not meet the normal admission requirements described above in *Admission from Ontario Secondary Schools*, you may be considered for admission as a part-time student *on university probation*, provided you are at least 21 years old (or will be in the calendar year in which you propose to start university study) and you have not attended secondary school on a full-time basis for at least two years. Admission is not automatic, but is at the discretion of the Faculty to which you are seeking admission.

If you are admitted, you may register as a *Special Student* to take one course at a time. Normally, these first courses will be Level I courses.

After you have taken 12 to 14 units, your performance will be reviewed.

1. If you have a weighted average of at least 4.0 and a grade of at least D− in each course, you *may* transfer to the Level I programme of the Faculty in which you are registered.
2. If you have a weighted average of less than 2.5, you *may not* continue *without* permission of your Faculty.
3. If you meet neither of the above conditions, you may take further courses as a *Special Student* and your record will be reviewed after you have taken at least 24 units in total.

At the second review:

1. If you have a weighted average in all the work taken of at least 4.0, you may transfer to the Level I programme of the Faculty in which you are registered.
2. If your weighted average is less than 4.0, you will be required to withdraw.

After you have met the above conditions to clear probation, you may continue your studies on either a full-time or part-time basis.

G. STUDENTS TRANSFERRING FROM OTHER UNIVERSITIES

If you wish to transfer to McMaster University, you will normally obtain credit only for courses in which you have achieved at least a 'C' (third-class honour) standing. Assessment of courses for transfer credit is subject to the guidelines of the individual Faculties.

A student transferring to McMaster University must satisfy the Residence Requirements set out in *Academic Regulations*. The University will not accord to students transferring to McMaster privileges which would not be granted by their own universities. Grades obtained in courses taken at another university will *not* be included in the various McMaster averages, and, therefore, cannot be used to raise standing.

For students transferring from a non-Canadian university, if your native language is not English and you have not resided in an English-speaking country for four years, you must obtain standing satisfactory to the University in the Michigan English Language Assessment Battery (MELAB). The MELAB authorization form will be sent upon receipt of a formal application for admission. If the Test of English as a Foreign Language (TOEFL) has already been written, its results may be submitted in place of the MELAB results.

H. GRADUATES APPLYING FOR A SECOND BACHELOR'S DEGREE

Admission is by selection.

If you have a first degree you may apply to take a second degree in the same discipline or in another discipline. The requirements are set out in the *Academic Regulations*. Application forms are obtainable from the Associate Registrar (Liaison and Admissions).

If you wish to enter a Second Bachelor's Degree in a subject area from the Faculty of Science, you should note the additional regulations for such a programme in the section *Faculty of Science, Second Bachelor's Degree Programmes*.

Graduates of other universities must supply an official up-to-date transcript with the completed application.

I. CONTINUING AND POST-DEGREE STUDENTS:

(Graduates not proceeding to a second degree or an advanced degree)

A **Continuing Student** is a university graduate who is not proceeding to an advanced degree, but wishes to take one or more undergraduate classes.

Continuing students who wish to take courses *other than* Commerce and Engineering need only to apply formally through Admissions in the first instance. In subsequent sessions they need only to submit a Registration form.

Continuing students who wish to take *Commerce* or *Engineering* courses must re-apply for each session on an application form obtainable from the Associate Registrar (Liaison and Admissions).

Applicants will be expected to have at least a 'C' (third-class standing) average, with no failures, in the work of their final year (or the equivalent, in the case of a degree taken in part-time studies), and academic records which are satisfactory to the Department and the Associate Dean (Studies) of the appropriate Faculty.

Acceptance as a Continuing Student carries no implications with respect to acceptance in the School of Graduate Studies. Students who plan to proceed to a graduate degree should apply *directly* to the Dean of Graduate Studies.

A **Post-Degree Student** is a university graduate or a person with professional qualifications who is not proceeding to an advanced degree but wishes to take one or more graduate courses.

Such students must apply to the appropriate departments and have their admissions and registrations approved by the School of Graduate Studies for each session in which they wish to take courses. These students will be registered and pay fees as undergraduates.

Acceptance as a Post-Degree Student carries no implications with respect to admission to advanced degrees, *and* even if such admission is granted subsequently, credit towards the advanced degree will not normally be granted for the work previously taken.

J. OCCASIONAL STUDENTS:

(Non-graduates attending undergraduate classes for other than degree credit)

Occasional students are those who:

1. do not hold a University degree; and
2. wish to take undergraduate courses; and
3. are or will be at least 21 in the calendar year in which they plan to take university courses.

An Occasional Student may take up to 12 units of work in courses at the discretion of the Dean of Studies and instructor(s) concerned in the period September 1 to August 31.

The status of an Occasional Student is reviewed after the completion of five courses, and a decision may be made at that time by the student as to whether he or she wishes to enter a degree programme or to continue as an Occasional student.

K. GRADUATES OF McMASTER CERTIFICATE PROGRAMMES

Students who have completed certificate programmes may be granted advanced credit up to maxima specified by Undergraduate Council. Such credit will normally be applied against elective courses and Faculties will take into account the subject matter of both the certificate and degree programmes.

L. ENRICHMENT PROGRAMME

High school students with first-class standing may be allowed to enrol in courses which do not duplicate the material available to them in their own high schools. Degree credit for successfully completed courses will not be granted until after students have been admitted to and have registered at McMaster University.

Applicants must provide letters of recommendation from their Principal as well as one other teacher who knows their abilities, aptitudes and interests.

Interested students are invited to contact the Office of Admissions for information regarding available courses and application procedures.

M. STUDENTS STUDYING IN CANADA ON STUDENT AUTHORIZATION (VISA)

In limited enrolment programmes up to 5% of places available in Level I may be filled by Visa students.

N. ADVANCED CREDIT

As noted in sections (A),(B),(C), and (G) above, advanced credit may be granted to applicants who have completed work at another university or college, *subject to the applicant having met the minimum requirements prescribed*. Advanced credit serves to shorten the degree programme.

In special situations, where a student has acquired the knowledge at another kind of institution or in a different manner such that the qualifications are difficult to assess, the University may require an examination of the student. In such a case, the Associate Dean (Studies) of the Faculty will request the appropriate academic department to assess the feasibility of such an examination. When such an examination is deemed feasible, the department involved will be responsible for deciding the appropriate method of evaluation and for administering the examination, which may consist of a variety of possible modes of evaluation, both written and oral. The examinations must be arranged by the last date for registration in the student's initial term at the University and may not be repeated. Any credit granted as the result of such an examination will be shown on the transcript in the normal manner used for advanced credit.

Academic Regulations

The regulations which follow are the general regulations of the University. You should read both these general regulations and the Faculty regulations which may be more stringent and appear in the Faculty sections of this Calendar.

Since the Academic Regulations are continually reviewed, we reserve the right to change the regulations in this section of the Calendar. This University also reserves the right to cancel the academic privileges of a student at any time should the student's scholastic record or conduct warrant so doing.

Honours and three-level degree programmes are offered in the Faculties of Humanities, Science, and Social Sciences and in the Arts and Science Programme. Major programmes are offered in the Faculties of Science and Social Sciences. The general regulations governing these programmes appear in this section of the Calendar. The regulations governing programmes in Business, Engineering, Engineering and Management, Medicine, Nursing, Occupational Therapy and Physiotherapy, Social Work, and Physical Education appear in the appropriate Faculty sections. In the event there is a conflict between the programme regulations for these eight programmes and the general regulations in this chapter, *the programme regulations take precedence.*

The following regulations cover the ordinary cases. Faculties are authorized to use discretion in special situations by taking into account past practice, the spirit of the regulations, and circumstances which, in the opinion of the Faculty, are deserving of unusual treatment. Students who have irregular cases should consult the appropriate Associate Dean (Studies).

General Regulations

RESIDENCE REQUIREMENTS

While most students will complete all their undergraduate work at McMaster University, the minimum requirements set out below apply to students who take part of their work at other institutions.

In order to obtain a four- or five-level (Honours, Major, etc.) first undergraduate degree, you must complete at least two of the levels (approximately 60 units of work) beyond Level I, including the final level, at McMaster.

In order to obtain a three-level, first undergraduate degree, you may satisfy the residence requirements either;

1. by completing the final level and at least one other level (a minimum of approximately 60 units of work) at McMaster University, or
2. by completing the final level (approximately 30 units of work) at McMaster University, including at least 18 units of Area courses.

The work used to satisfy the residence requirements must be completed at McMaster University; work taken at another university on a Letter of Permission will not count toward the minimum residence requirements. The appropriate Dean of Studies may relax these requirements in special cases, and may take into account high academic standing and place of residence, among other considerations.

All the work for a second bachelor's degree must be completed at McMaster University.

REGISTRATION

The purpose of registration is to record officially your selection of programme and courses. This is done before or at the beginning of each session, and information on how to register will be sent to eligible students. Counselling is available to assist you in course selection and in some programmes is compulsory.

Selection of Courses: Before you select the courses you wish to take, please read the requirements for your programme in the appropriate Faculty sections of this Calendar. First select the courses required for your programme and then electives; ensure that you have completed the courses which are listed as *prerequisites* and have completed or chosen courses that are listed as *corequisites*. If you fail to meet the programme requirements, you will not be eligible to graduate, and, if you have not passed the prerequisite courses, you will not be able to take the course selected.

Approval of Programmes: You are responsible for the completeness and accuracy of your registration. If you try to register in a programme or courses for which you are not qualified, your registration may not be accepted and you may not receive credit in selected courses. Your programme and course selection must be approved by the Associate Dean (Studies) of your Faculty. Similarly, you must obtain approval from the Associate Dean (Studies) for any change, including the dropping of courses. You should note that in order to qualify for most scholarships, you must register for the full load prescribed for your programme and level.

***Extra* Work:** If you wish to take more than the normal number of units prescribed for a Level, you may do so only with the permission of the Associate Dean (Studies) of your Faculty. Normally, a University Average of at least 7.0 in the immediately preceding review period will be required if extra work is to be permitted. Additional academic fees will be assessed where the extra work is approved to clear an academic deficiency.

Sequence of Courses: Courses must be taken in the sequence specified in the programmes of the University which are set out by Faculty. For programmes described by Level, this means that, when registering in a Level, you must have completed the preceding Level, or be registered in any remaining courses for that Level. At the discretion of your Faculty, substitutions may be approved, especially for part-time students, when a required Area course is not available.

Repetition of Courses: To repeat a course for which credit has been obtained, you need approval of your Associate Dean (Studies). There is no limit on the number of repetitions of a failed course. The grades for all attempts appear on the transcript and enter into the computation of the various averages; however, only one successful attempt will enter into the computation of credit earned towards your degree.

Limit on Level I Courses: After you have completed Level I, you may obtain credit in no more than 12 additional units of courses beginning with the digit 1 in a three-level degree programme, and no more than 18 additional units of courses beginning with the digit 1 in a four-level degree programme, except where special permission has been obtained from the Associate Dean (Studies). This means that in most Faculties credit may be obtained in no more than 42 units of Level I courses in a three-level programme, and in no more than 48 units in a four-level programme.

Letters of Permission: If you wish to attend another university to take courses which will carry credit towards a McMaster degree, you must obtain permission ahead of time. To do this you must seek a *Letter of Permission* from your Associate Dean (Studies) and pay the appropriate fee. If your Associate Dean (Studies) grants you this privilege, you should take note of any conditions that might apply, including the requirement of a grade of at least C− for transfer credit. Courses taken at another university cannot be used to satisfy the minimum residence requirements, and probably will delay graduation if permission has been granted to take the last courses for the degree at another institution.

You should note that the grades obtained in courses taken at another university will *not* be included in the various McMaster averages, and, therefore, cannot be used to raise standing.

Auditing Courses: A student who does not wish to have credit for a course may, with the approval of the Chairman of the Department and the Associate Dean, *audit* the course. The student must satisfy the prerequisite for the course, but will not complete assignments nor write the final examinations.

Cancellation of a Course: If you cancel a course during the change of registration period, it will not show on your record. After that the course will show on your record. The grade will be recorded as *CAN* (cancelled) if the course is cancelled up to and including the last date for withdrawing from the course shown in the *Sessional Dates.*

After the last date for withdrawing you will remain registered in the course whether or not you attend, you will receive no refund of fees, and you will be assigned a grade based on the work submitted.

The various dates appear in the *Sessional Dates* at the beginning of this Calendar and **are rigidly adhered to**.

Withdrawal from the University: If you wish to withdraw from the University, you must consult the appropriate Associate Dean (Studies). Your identity card must be surrendered to the Associate Dean (Studies). Fees are not refunded unless this procedure is followed.

Your record in the courses being taken will be handled as outlined in the section above *Cancellation of a Course*.

Readmission: If you are seeking readmission to the University following withdrawal or poor academic performance, you must do so in writing. You should pay attention to any special requirements of the Faculty you wish to re-enter, including the deadline for applications. These requirements are specified in the Faculty sections of the Calendar.

In considering applications for readmission, the University may take into account both the secondary and post-secondary educational achievement of the applicant, and may require oral or written tests of the applicant, or other evidence which in the judgement of the appropriate Faculty is relevant. The Faculty may specify conditions which must be met in granting readmission.

Transfer of Credit between Faculties: Transfer of credit between Faculties is handled by the Associate Deans (Studies). Full credit may not be given at the time of transfer between Faculties and additional courses may need to be taken.

MCMASTER TEST OF WRITING COMPETENCE

This regulation is currently under review.

All students entering baccalaurate degree programmes must write a test of writing competence which is held in August, September, December, and April. New students who present an interim or final mark of at least 80.0% in an Ontario Grade 13 or OAC English course, and students entering the Occupational Therapy and Physiotherapy programme, are exempt.

Those who *fail or do not take* the test will have the following notation on their records and transcripts: *This student has not passed the McMaster Test of Writing Competence*. This will be removed after the test is passed.

Those who *do not attempt* the test will *not be allowed to register* in or after the September following their initial registrations.

The Faculties of Engineering, Humanities, and Social Sciences have additional requirements which are noted in their Faculty sections of this Calendar.

EXAMINATIONS

The section *Sessional Dates* should be consulted for the dates of the final examinations in all terms and sessions. Mid-session tests for full-year Winter Session Level I courses are held in December.

Mid-session tests in December for Level I courses and final examinations for two and three-unit courses normally are of two hours duration. Final examinations for courses of four or more units normally are of three hours duration.

No examinations or tests may be held in the final week of the terms of the Winter Session except for those specifically approved by the Undergraduate Council. The specific dates appear in the *Sessional Dates*.

Tests and examinations organized by the Office of the Registrar may be scheduled in the morning, afternoon, or evening, Monday through Saturday. You should arrange to be available throughout the examination periods since, until the final examination timetable is published, you cannot know when during the examination period your examination may be scheduled. Cases in which examinations can be rescheduled are described at the end of this section.

If you miss an examination for medical reasons you must submit a medical certificate from Student Health Services or from a doctor to the Office of the Registrar. The certificate must define both the disability and the period of absence, and must be submitted by the end of the examination period.

If you miss an examination for any reason other than illness, you must report immediately to the Examination Section of the Office of the Registrar.

Deferred Examinations: A deferred examination privilege may be granted by your Faculty Reviewing Committee if you fail to write a final examination for a certifiable medical or compassionate reason, provided that you have submitted the certificate by the end of the examination period. Deferred examinations are conducted in the examination period which follows the period for which the privilege is granted (e.g. in April for an examination missed in December.) Specific dates and deadlines appear in the *Sessional Dates*.

A decision to grant a deferred examination privilege will be reported on your grade report. You must confirm your intent to write a deferred examination by submitting an application to the Office of the Registrar. Specific deadline dates appear in the *Sessional Dates*.

Examination Regulations: These regulations apply to all examinations conducted by the Office of the Registrar. Variations may occur for instructor-conducted examinations. Students who do not observe these regulations will be required to withdraw from examinations. Special circumstances must be reported immediately to the Examination Section of the Office of the Registrar.

McMaster student photo identification cards are required at all examinations. Students who seat themselves at an examination without photo I.D. cards will be required to withdraw from the examination. Students who arrive without photo I.D. cards will be required (before being seated) to obtain a substitute card and pay the appropriate fee; no extension of the examination will be permitted to compensate for any delay encountered.

It is the responsibility of students to be present on the day and hour when an examination is scheduled. If you fail to appear at the scheduled time, you will be considered to have defaulted the examination.

Punctuality is essential and no extra time will be allowed to those arriving late. No candidate will be admitted to an examination room more than 30 minutes after the start of any session.

The University makes every effort to ensure that examinations are complete when students receive them. However, it is the **student's responsibility** to ensure that the examination is complete, and to draw attention to any discrepancies in the paper.

No candidate may leave the room to withdraw from an examination during the first 45 minutes of any session. Candidates must leave the room immediately after handing in their examination materials.

A student who becomes ill during an examination may be excused by a Presider but must file a doctor's certificate with the Office of the Registrar.

No conversation or any form of communication between candidates is permitted in the examination room. No books, papers or instruments may be taken into any examination room unless specifically prescribed on the examination paper. No examination books or supplies are to be removed from the examination room. Smoking is not permitted in any examination room. Handbags must be left beneath the chairs, not on the desks. The University can assume no responsibility for lost articles.

Rescheduling Examinations: Special examination arrangements will be made if you have a conflict with religious obligations. Your request with appropriate documentation from a minister or equivalent must be submitted to the Examinations Section of the Office of the Registrar at least ten working days before the scheduled examination date.

If you are a part-time student and your employer requires you to be away from the Hamilton area when you are to write an examination, you may seek special arrangements for writing your examination. Your application must be supported by a letter of explanation from an executive of your company.

Examinations are not rescheduled for purposes of travel.

Other regulations related to the conduct of, and special arrangements for, examinations appear on the examination timetable and the examination booklets.

GRADING SYSTEM

The grade for a course is normally determined by combining the grades obtained on classwork, assignments, tests, and examinations. The method for determining the final grade is to be given in the course outline. Unless otherwise specified in a course outline, course results determined on a percentage scale will be converted to an official letter grade as indicated in the equivalent percentage scale which follows. The results of all courses attempted will appear on your transcript as letter grades.

Since September 1982, the grading scale has been as follows:

Grade	Points	Equivalent Percentages	Standing
A+	12	90 - 100	
A	11	85 - 89	first class
A−	10	80 - 84	
B+	9	77 - 79	
B	8	73 - 76	second class
B−	7	70 - 72	
C+	6	67 - 69	
C	5	63 - 66	third class
C−	4	60 - 62	
D+	3	57 - 59	
D	2	53 - 56	pass
D−	1	50 - 52	
F	0	0 - 49	failure

Before submitting a failing grade, the instructor reassesses whatever examples of the student's work are available.

For the purpose of satisfying prerequisite requirements a grade of at least D− is required unless otherwise stated.

You retain credit for all courses with grades of D− or better, except in those programmes for which a higher grade is specified in the programme regulations.

Weighted averages are calculated using the grade points and units for a course as shown in the example below:

Grade	Points		Units		
A−	10	×	6	=	60
C+	6	×	3	=	18
B	8	×	6	=	48
D+	3	×	6	=	18
B−	7	×	6	=	42
B+	9	×	3	=	27
Total			30		213

AVERAGE = 213 ÷ 30 = 7.1

Terminology

This glossary of terminology is arranged in alphabetic sequence.

Area Courses ('A' courses) are those courses in which the grades are used in computing the Cumulative Area Average (CAA) and the Graduation Average (GA). These courses are listed in the programme requirements.

Course Numbers (e.g. 1A03) can be deciphered as follows: the initial digit indicates the Level of the course; the letter(s) in the middle identifies the specific courses within the Level; and the final digit defines the number of units of credit associated with the course.

Cumulative Area Average (CAA) is computed as shown in the example below, using the best 80% of the grades obtained in the Area courses prescribed for the programme beyond Level I, provided that at least 12 units of Area courses have been attempted since the CAA was computed.

For students re-admitted to the University after obtaining a University Average of less than 2.0, the CAA will be computed from the time of re-admission.

In Combined Honours programmes consisting of two separate components two Cumulative Area Averages will be computed on the best 80% of the grades in each component; in other Combined Honours programmes a single average will be computed.

The grades in the following example are ranked in descending sequence. Since the student has taken 27 units, the average will be computed on the basis of the best 21.6 units (80% of 27 = 21.6). Thus, only 0.6 units of the course in which the student obtained the D+ have been included.

Grade	Points	(Units)	CAA Units		
A−	10	(6)	× 6.0	=	60.0
B	8	(6)	× 6.0	=	48.0
B−	7	(6)	× 6.0	=	42.0
C+	6	(3)	× 3.0	=	18.0
D+	3	(6)	× 0.6	=	1.8
Total		(27) × 80%	= 21.6		169.8

CAA = 169.8 ÷ 21.6 = 7.9

Elective Courses ('E' courses) are those courses which are not required courses, and which a student has free choice in selecting. These courses form part of the total number of units required for the degree programme.

Extra Courses are those courses taken by a student which are over and above the total number of units required for the degree programme. The grades obtained in such courses will not be included in the computation of the various averages.

Graduation Average is used to determine the standing of a student at the time of graduation. In the case of the three-level degree programmes it is computed on at least 24 units of Area courses, and in the case of Honours and Major programmes on at least 36 units of Area courses. For Combined Honours programmes created from two distinct components, two Graduation Averages will be computed using at least 24 units in each component; in other Combined Honours programmes a single average will be computed.

For three-Level programmes the computation will be based on Level II and III Area courses, (i.e. courses with a first digit of 2 or 3) and for Major and Honours programmes on Level III and IV Area courses (i.e. courses with a first digit of 3 or 4). Where a student has taken more than the minimum number of Area courses specified for the programme, the Graduation Average will be computed on the best 80% of the appropriate Area courses, or the minimum, whichever number of units is greater.

In the example below of a three-level degree programme the total number of appropriate Area course units with a course number beginning with 2 or 3 actually taken was 42 and the required number was 24, so that the average will be computed on the basis of the best 33.6 units (80% of 42 = 33.6). If the student had taken 24-30 units of appropriate Area courses, the Graduation Average would be calculated on 24 units.

Grade	Points	(Units)	GA Units		
A	11	(6)	× 6.0	=	66.0
A−	10	(6)	× 6.0	=	60.0
B+	9	(3)	× 3.0	=	27.0
B	8	(6)	× 6.0	=	48.0
B	8	(3)	× 3.0	=	24.0
B	8	(6)	× 6.0	=	48.0
B−	7	(3)	× 3.0	=	21.0
B−	7	(3)	× 0.6	=	4.2
C+	6	(6)	× 0.0	=	0.0
Total		(42) × 80%	= 33.6		298.2

GA = 298.2 ÷ 33.6 = 8.9

Graduation Standing is assigned on the basis of the Graduation Average calculated as above. First-class standing is given to those with averages of 9.5 or higher, second-class for averages of 7.0 to 9.4, and third-class for averages of 4.0 to 6.9.

Level is used in two ways:

1. to describe how far through a programme a student has progressed. A student entering the University with the normal admission requirements will register in Level I and normally take 30 units of courses beginning with the digit 1; upon completion of Level I the student will progress to Level II, etc. The number of units required to complete a level is specified for each programme in the Faculty section of this calendar.
2. to indicate at what stage in a programme a student normally takes a given course. Level I courses (beginning with the digit 1) normally are taken by students registered in Level I, Level II courses by students registered in Level II, etc. The level designation is only a guideline, however, in that the academic regulations and curriculum requirements may provide for deviations from this guideline.

Programme Probation may be assigned to students who do not meet the normal promotion requirements on the Cumulative Area Average for a programme, which appear under the programme regulations. A student may be on Programme Probation only once.

Required Courses ('R' courses) are those courses which are specifically designated for inclusion in a programme.

Reviewing Period is the time between two reviews for a student. Students records are reviewed in May, July, and August each year for those who

1. have attempted at least 18 units of work since the last review, or
2. may be eligible to graduate at the next Convocation, or
3. were admitted under the part-time mature student provision and have attempted the first 12 units of work which constitute their probationary period.

Units define the amount of credit associated with a course and are used in the computation of averages. A unit is roughly equivalent to one lecture-hour per week for one term or two hours of laboratories or seminars per week for one term. Most courses are of 3 or 6 units credit. Normally 30 or more units or work are specified for a Level; approximately 90 units or more constitute the work for a three-level degree and 120 units or more for a four-level degree.

University Average is computed on the grades obtained in all courses since the last review of student standing.

University Probation may be assigned to students who fail to obtain a University Average of 2.5 which is required for continuance at the University but do obtain a University Average of at least 2.0. A student may be on University Probation only once, except with the special permission of the Faculty in which he or she is registered.

Programme Requirements and Academic Standing

Students entering McMaster University register in one of the following Level I programmes: Arts and Science I, Business I, Engineering I, Humanities I, Music I, Natural Science I, Nursing I, Physical Education I, or Social Sciences I. The admission requirements for specific programmes beyond Level I (e.g. Honours History) appear in the appropriate Faculty sections of the Calendar and prescribe the required standard of performance in appropriate Level I courses.

ACADEMIC STANDING

Academic standing is reviewed in May, July, and August each year for students who

1. have completed at least 18 units of work since the last review, or
2. may be eligible to graduate at the next Convocation, or
3. were admitted under the part-time mature student provision and have attempted the first 12 units of work which constitute their probationary period.

In the review of academic standing, three sets of decisions are made:

1. whether a student may continue at the University for which the University Average, calculated on at least 18 units, is used;
2. whether a student may continue in a programme for which the Cumulative Area Average, calculated on at least 12 units of area work, is used; and
3. whether a student may graduate and the classification of the degree, for which the Graduation Average is used.

REQUIREMENTS FOR LEVEL I

If you enter the University without advanced standing being granted, you must attempt a full load of Level I work before proceeding to the work of higher Levels. Admission to the programmes beyond Level I is based on the performance in Level I, and you must meet the normal requirements prescribed in the following section, *Minimum Requirements for Continuance at the University*, in order to continue at the University.

If you meet the requirements for continuance at the University after completing the Level I work, but fail to meet the admission requirements of any programme, you may continue at the University for one additional reviewing period. You will be registered as Irregular on Programme Probation.

If you again fail to qualify for admission to a programme, you may *not continue without special* permission.

If you are repeating Level I voluntarily, your registration status will be *Clear Admission*.

In the case of part-time students, the Associate Dean (Studies) has the discretion to permit students to take some of the work in the higher Levels prior to having attempted the full load of Level I. Decisions will be made on an individual basis according to the special circumstances that apply in the particular case.

MINIMUM REQUIREMENTS FOR CONTINUANCE AT THE UNIVERSITY

You may continue at the University if you obtain a University Average of at least 2.5, subject to meeting any special requirements of your programme. If you fail to meet the requirement of a 2.5 average, you may continue on University Probation for one reviewing period, provided that you have a University Average of at least 2.0. You may be on University Probation only once.

If your University Average is less than 2.0 you may not continue without permission and must seek re-admission. The decision will be made by the appropriate Faculty Reviewing Committee, and, if you are permitted to continue, you will be placed on probation for one reviewing period.

If you fail to obtain a University Average of 2.5 on a second occasion, you will be required to withdraw from the University for a period of at least 12 months. If there are special circumstances which apply, the Faculty Reviewing Committee may waive the requirement of withdrawal for 12 months.

In the event that you are eligible to continue at the University, but are ineligible to continue in any programme because the programme requirements have not been met, you require the permission of your Faculty to reregister. If permitted to reregister, you will be on programme probation and may register as Irregular for one reviewing period, during which you may take up to 18 units of Area work that would qualify you to re-enter a programme. Other courses taken may be used as electives. *This privilege will be granted only once.*

PROGRAMME REQUIREMENTS FOR B.A. AND B.SC. PROGRAMMES

The programme requirements are **in addition** to the minimum requirements prescribed above for continuance at the University.

Honours Programmes: If you obtain a Cumulative Area Average of at least 7.0 you may continue in an Honours programme. If you fail to obtain a Cumulative Area Average of 7.0 but have an average of at least 6.5, you may continue on Programme Probation for one reviewing period. You may be on Programme Probation only once. If you fail to obtain a Cumulative Area Average of 6.5, you may not continue in the programme, and must seek entry to another programme.

Graduation Standing in Honours degree programmes is awarded in three classes: first-class, second-class, and third-class. For first-class standing a minimum Graduation Average of 9.5 is required, for second-class standing 7.0 and for third-class standing 4.0.

A student who at the time of graduation fails to meet the requirements for an Honours degree may seek to transfer to another programme.

Combined Honours Programmes: All Combined Honours programmes offered by the Faculty of Science will be treated in the same manner as single Honours programmes above, thus, a single CAA and GA will be computed.

In the case of Combined Honours programmes in other Faculties two separate Cumulative Area Averages will be computed using the Area courses for each of the two components, except where the Calendar specifies that a single average will be computed. Where two Cumulative Area Averages are computed, you must meet the specified minimum averages for each of the two components of the combined Honours Programme.

Similarly, two separate Graduation Averages will be computed, and Graduation Standing will be determined by taking the mean of the two Graduation Averages, except for those programmes where a single CAA is computed, in which case one Graduation Average will be computed.

A student who at the time of graduation fails to meet the requirements for a combined Honours degree may seek to transfer to another programme.

Major Programmes: Major programmes are available through the Faculties of Science and Social Sciences.

Effective for students registered in the programme **before September 1987:** If you obtain a Cumulative Area Average of at least 4.0, you may continue in a Major programme. If you fail to obtain a Cumulative Area Average of 4.0 but have an average of at least 3.5, you may continue on Programme Probation for one reviewing period. You may be on Programme Probation only once. If you fail to obtain a Cumulative Area Average of 3.5 you may not continue in the programme and must seek entry to another programme.

Effective for students admitted to a Major programme **after August 1987:** If you obtain a Cumulative Area Average of at least 5.0, you may continue in a Major programme. If you fail to obtain a Cumulative Area Average of 5.0 but have an average of at least 4.5, you may continue on Programme Probation for one reviewing period. You may be on Programme Probation only once. If you fail to obtain a Cumulative Area Average of 4.5 you may not continue in the programme and must seek entry to another programme.

Graduation Standing in Major degree programmes is awarded in three classes: first-class, second-class, and third-class. For first-class standing a minimum Graduation Average of 9.5 is required; for second-class standing 7.0; and for third-class standing 4.0 for the first group covered above and 5.0 for the second group. A student who at the normal time of graduation fails to meet the requirements for a major degree may seek to transfer to another programme.

Three-Level Degree Programmes: If you obtain a Cumulative Area Average of at least 4.0 you may continue in the programme. If you fail to obtain an average of 4.0 but have an average of at least 3.5, you may continue on Programme Probation for one reviewing period. You may be on Programme Probation only once. If your Cumulative Area Average is less than 3.5, you may not proceed in the programme and must transfer to another programme.

Graduation Standing in these programmes is awarded in three classes: first-class, second-class, and third-class. For first-class standing a minimum Graduation Average of 9.5 is required; for second-class standing 7.0; and for third-class standing 4.0. A student who at the normal time of graduation fails to meet the requirements for one of these degrees may seek to transfer to another programme.

TRANSFER BETWEEN PROGRAMMES

If you are registered in Level III of an Honours or Major programme and wish to transfer to a three-level degree programme in order to be eligible for graduation at the next Convocation you must apply to the appropriate Associate Dean (Studies) by *March 1 for Spring Convocation and by September 1 for Autumn Convocation*. If permission is granted, you must go to the Office of the Registrar and complete a graduation information card.

If you wish to transfer from one programme to another, you must have a Cumulative Area Average with standing appropriate for the programme you wish to enter. The Faculty will specify whether you need to take additional course work to obtain a specialist background equivalent to that of students already registered in the programme. You should discuss the practicability of transfer with the appropriate Associate Dean (Studies).

SECOND BACHELOR'S DEGREE PROGRAMMES

For admission to a second undergraduate degree programme you must hold a first undergraduate degree. The minimum admission requirements and programme of study for the second degree depend on both second and first degrees and whether they are in the same subject.

Credit for courses taken towards the first degree may be applied to the second degree, except in the case of some professional programmes (e.g. Bachelor of Education and Bachelor of Library Science). Some additional regulations are applied by the Faculty of Science involving cognate disciplines e.g. Mathematics and Statistics. These are described in the section *Faculty of Science* in this Calendar.

Extra courses taken while you are registered in a first degree programme may, with the approval of the Faculty, be applied to the second degree programme.

All the additional work to obtain the second degree must be taken at McMaster University. Decisions on admissions and the courses required to complete the second degree will be made by the appropriate Faculty.

Credit from the first two degrees *cannot* be applied to a third undergraduate degree. To obtain a third undergraduate degree it would be necessary to take the complete programme, i.e. approximately 90 units for a three-level degree and approximately 120 for a four-level degree.

Students who do not qualify for a Second Degree programme on the basis of the relevant course work completed during their first degree studies may, with the permission of the department and appropriate Associate Dean (Studies), be allowed to qualify on the basis of further work undertaken as *Continuing* students considered in conjunction with their previous performance in the area courses.

Students who are allowed to qualify for admission on the basis of further work taken as *Continuing* students at McMaster University may, with the permission of the department and the appropriate Associate Dean (Studies), have this course work applied toward the fulfillment of the requirements for the second degree. Faculties wishing this provision to apply only to second degree programmes in *another subject* may make that restriction in the Faculty regulations. (The Faculty of Science has so indicated.)

A student in a Second Degree programme must meet the minimum requirements prescribed in earlier sections for the University Average, the Cumulative Area Average, and the Graduation Average, with the exception that, where the number of Area courses prescribed is less than the minimum normally prescribed for inclusion in the Graduation Average, all Area courses taken in the second degree programme will be included in the computation of the Graduation Average. If less than 12 units are used to compute the Graduation Average, no Graduation Standing (first class, etc.) will be given.

Major Degree Following a Three-Level Degree in Same Subject: For entry into a Major Degree programme in the Faculty of Science, a Graduation Average of at least 4.0 in the first degree programme is required for those entering a major programme before September 1987; thereafter an average of at least 5.0 will be required.

If admitted, you must take at least 30 units of work as specified by the department(s); normally this will include the Level IV specialist courses and courses from Levels II and III to provide specialist background equivalent to that of students already in the programme.

Honours Degree Following Major or a Three-Level Degree in the Same Subject: For entry, a Graduation Average of at least 7.0 in the first degree programme is required.

If admitted, you must take at least 30 units of work specified by the department(s); normally this will include the Level IV specialist courses and courses from Levels II and III to provide specialist background equivalent to that of students already in the programme.

Second Degree in Another Subject: For admission to the second degree you must meet the admission requirements for the programme you wish to enter (e.g. an average in specified courses of at least 7.0 for entry to an Honours programme and of at least 4.0 for entry to other programmes of the Faculties of Humanities, Science, and Social Sciences). The average used for admission would normally be based on Area courses for, or courses related to, the programme you wish to enter.

If the second degree is a Bachelor of Arts or Bachelor of Science degree, you must complete at least 30 units of work specified by the department offering the programme. If the second degree is a Major or Honours degree, the minimum is 60 units.

DEANS' HONOUR LIST

Each year outstanding students are recognized by their being named to the Deans' Honour List for which a minimum average of 9.5 is required. In the case of full-time students, they must have completed in a Winter Session at least 30 units (36 in the case of Engineering). The Deans have the power to exercise discretion where the full load for a particular level of a programme is less than 30 (36 in Engineering e.g. Civil Engineering and Engineering Mechanics, Level IV, 34 to 36 units). In the case of a full-time student the minimum average of 9.5 must have been obtained on the University Average. For those who have studied part-time on a continuous basis, the assessment will be made at the reviewing periods where 30, 60, and 90 units have been completed, and at graduation.

(The special provision for students in the B.H.Sc. programme is explained in the section *Faculty of Health Sciences, Occupational Therapy & Physiotherapy Programme.*)

Graduation

When you register for the session in which you expect to complete the graduation requirements, you must file a graduation information card. If you fail to do so at the time of registration you must do so in the Office of the Registrar *before* February 15 for Spring Convocation and *before* September 8 for Autumn Convocation.

Graduates must take the degree at the Convocation *immediately* following the completion of the appropriate degree work.

A Programme Standing will be determined for students who have fulfilled the graduation requirements in May of each year. The Programme Standing will be determined on the basis of the Graduation Average and will appear on the transcript. The notation will show your rank in the graduating class for the programme and the number of students graduating from that programme in May.

Senate Policy Statements

The University has defined its expectations of students in both the academic and non-academic life of the University community, and developed procedures to ensure that all members of the community receive equitable treatment. Each year at registration, you will receive the document *Senate Policy Statements* which contains the following:

Statement on Academic Ethics
The University's Statement on Human Rights
Policy Statement on Applicants and Students with Disabilities
Code of Conduct
Student Appeal Procedures
Policy on Undergraduate Student Access to Final Examinations
General Regulations for McMaster University Library

The following provides a brief summary of the major policies contained in the *Senate Policy Statements*. Complete versions of the policies may be obtained from the Senate Secretariat, Room 104, Gilmour Hall.

ACADEMIC ETHICS

The *Senate Statement on Academic Ethics* explains the expectations the University has of its scholars. Some Departments and instructors have also developed more specific rules and regulations designed to maintain scholarly integrity. It is the responsibility of each instructor to make students aware of these expectations.

It is the responsibility of each student to adhere to the *Senate Statement on Academic Ethics* (and to any additional rules and regulations developed by Departments and instructors), not only in coursework, tests and examinations, but also in other scholarly activities such as laboratory research, and the use of computing and library resources.

Breaches of academic ethics fall into two general categories:

a. a disregard for the norms of scholarly integrity, without necessarily intending to deceive; and
b. academic dishonesty, which is an intentional disregard for the norms of scholarly integrity.

Minor breaches of academic ethics that fall into category (a) are normally drawn to students' attention by instructors and may result in penalties such as a reduced mark or a zero for the piece of work.

Academic dishonesty is not qualitatively different from other types of dishonesty. It consists of *misrepresentation by deception or by other fraudulent means.*

The *Senate Resolutions on Academic Dishonesty* define academic dishonesty and specify the procedures to be followed in the event that a student is charged with academic dishonesty. Penalties include expulsion from the University. A copy of the Senate Resolutions may be obtained from the Senate Secretariat, Gilmour Hall, Room 104.

APPEAL PROCEDURES

The University has a responsibility to provide fair and equitable procedures for the lodging and hearing of student complaints arising from University regulations, policies and actions that affect them directly. The procedures described in the *Student Appeal Procedures* are intended to provide a mechanism to remedy injustices and may culminate in a hearing before the Senate Board for Student Appeals.

Students are strongly encouraged, however, to pursue any complaint or grievance through informal channels, before following the formal procedures. Experience has shown that many complaints can be resolved satisfactorily through informal communication.

Students should seek remedies for their grievances as promptly as possible, and must do so within six months of the end of the academic year in which the grievance has occurred. The end of the academic year is August 31.

Decisions on admission or re-admmission to an undergraduate degree programme cannot be *appealed*, except under the conditions described in the next paragraph. Applicants may, however, ask for a *review* of a decision on admission or re-admission or on the granting of transfer credits. To initiate such a review, the applicant must write to the Registrar within one week of receiving the original decision and state the grounds for seeking the review.

Applicants who have been refused re-admission to an undergraduate degree programme may appeal the decision, using the procedures described in the *Student Appeal Procedures*, if the following two conditions have been met:

i. the applicant withdrew from the University voluntarily; and
ii. the applicant alleges error or injustice on grounds other than academic judgement.

CODE OF CONDUCT

McMaster University is a community dedicated to furthering learning, intellectual inquiry, and personal and professional development. Membership in the community implies acceptance of the principle of mutual respect for the rights of others and a readiness to support actively an environment conducive to intellectual growth, both for individuals and for the whole University.

The *Code of Conduct* contains regulations which outline the limits of conduct considered to be consonant with the goals and the well-being of the University community, and define the procedures to be followed in cases of violation of the accepted standards.

STATEMENT ON HUMAN RIGHTS

McMaster University wishes to ensure the full and fair implementation of the principles of the *Ontario Human Rights Code* which states:

> *Every person has a right to equal treatment with respect to services, goods and facilities, without discrimination because of race, ancestry, place of origin, colour, ethnic origin, citizenship, creed, sex, sexual orientation, age, marital status, family status or handicap.*

The University Senate has approved Procedures on Human Rights which outline the procedure to be followed in the event that a student has a complaint regarding an alleged violation of human rights.

STUDENT RECORDS

The University has developed operating procedures which are designed to protect the confidentiality of undergraduate student records. The following have been defined as public information: student number, student name, sex, degrees earned and when, undergraduate awards earned and when, and whether a student is full-time or part-time. Additional information may be used by the various offices and officials of the University where a *need to know* has been established.

Information about applicants for admission who do not gain admission will be kept for a limited period only. For those admitted to the Nursing and M.D. Programmes a separate admission file is maintained.

While a student may have access to his or her file, documents received from a third party in confidence are not normally placed in the student's file, but, in those cases where they have been, they will not be disclosed.

The operating procedures also define the circumstances under which information may be disclosed to: judicial and law enforcement agencies, the Ontario Universities Application Centre, Statistics Canada, agencies charged with the recovery of funds provided under OSAP or CSL, and secondary schools.

Transcripts are issued only with the consent of the student. Addresses will not be released except under provisions noted above.

Financial Information

Upon receiving official acceptance from the Registrar's Office and upon completion of registration, a student is responsible for the full payment of all fees as defined in this Calendar.

Payment of academic fees does not mean acceptance to the University or approval of a student's registration. Academic requirements have to be fulfilled before registration is completed.

New students may not forward *academic fees* to the Business Office *until* they have received their Letters of Acceptance.

Students should not send *residence fees unless* notification of acceptance has been received.

Students are responsible for the fees for each academic session and no fee credits can be transferred from one academic session to another.

It is the policy of the University not to accept registrations until all previous accounts are paid in full. Any payments received are therefore first applied to previous debts and any balances to the most recent debts.

The University reserves the right to amend the fees at any time.

Undergraduate Fees

Fees are composed of an academic fee and supplementary fees. Academic fees are calculated on a per unit basis up to the maximum stated under *Tuition Fee* in the fee schedules, below. Full supplementary fees are payable by full-time students, i.e. those taking 24 units or more.

Fees for full-time students cover the student's portion of the tuition cost, registration, library, diplomas, campus health services, student organizations, and athletics (except for the facilities fee), and are payable by all students.

Fees **do not** cover the Ontario Health Insurance Plan, which is the personal responsibility of the student.

No caution deposits are required, but students will be assessed for any unwarranted breakage.

The University reserves the right to assess other supplementary fees or charges in some courses or programmes to recover in part or in full the cost of providing course materials, and accommodation and transportation for field trips, and the costs of breakages.

Fees charged by the University are approved annually by the Board of Governors for the academic year commencing September 1. Fees shown below are for 1988/89. The current fee schedule, including the refund schedule, for any given academic year will be sent to each student during the summer preceding September registration.

CANADIAN CITIZENS and LANDED IMMIGRANT STUDENTS

Full-time Fees (for an academic load of **28 units or more**)

	Tuition Fee	Supplementary Fees	Total Fees
Medicine I,II	$2,691.00	$244.00	$2,935.00
Medicine III	1,794.00	225.00	2,019.00
Engineering, and Eng. Mgt. III, V	1,531.00	223.30	1,754.30
Eng. Mgt. II,IV	1,410.00	223.30	1,633.30
Nursing	1,410.00	212.30	1,622.30
Business and Commerce	1,410.00	175.30	1,585.30
Arts & Sci. Prog.	1,410.00	170.30	1,580.30
Physical Education	1,410.00	165.30	1,575.30
All other programmes	1,410.00	160.30	1,570.30

For academic loads from **24 to 27 units**, the fee was $48.50 per unit plus full supplementary fees.

Student Health Services Fee: The supplementary health services Medical fee of $11.00 supports the "on campus" clinic facilities which provide the services of doctors and nurses. The McMaster Student's Union Health Insurance Plan fee of $25.00 includes reimbursement of expenses up to $500.00 resulting from an accident incurred during the academic year, where such expenses are not recoverable under the Ontario Health Insurance Plan. These expenses may include X-ray, ambulance, dental treatment, prescribed drugs, wheelchairs or similar appliances. Reimbursement is not made for accident expenses to dental plates, crowns, fillings, glass frames, lenses or similar. Accidents should be reported to Student Health Services within ten days.

Part-time Fees

For students who took less than 18 units, the fee was $48.50 per unit plus a supplementary fee of $2.00 per unit for membership in the McMaster Association of Part-time Students/COPUS. Students who took 18-23 units paid supplementary fees of $107.30 for membership in the McMaster Students Union.

Listeners

A *Listener* is one not seeking credit, and may be admitted at one-half of the standard fee upon application to the Centre for Continuing Education.

A husband and wife attending the same course as Listeners may pay the reduced rate of one Listener fee, plus half of the fee for another listener.

Persons Aged 65+

Subject to meeting admission and prerequisite requirements, persons aged 65 and over may register in any courses without payment of tuition fees.

VISA STUDENTS

Full-time Visa Students (for an academic load of 28 units or more)

	Tuition Fee	Supplementary Fees	Total Fees
Medicine I,II	$11,505.00	$244.00	$11,749.00
Medicine III	7,670.00	225.00	7,895.00
Nursing	7,670.00	212.30	7,882.30
Engineering, and Engin. & Mgt.	7,670.00	223.30	7,893.30
Business and Commerce	4,700.00	175.30	4,875.30
Arts & Sci. Prog.	4,700.00	170.30	4,870.30
Physical Education	4,700.00	165.30	4,865.30
All other programmes	4,700.00	160.30	4,860.30

Part-time Visa Students

Visa students **enrolled in** Engineering, Engineering and Management III, V and Nursing courses were assessed at $213.50 per unit tuition fee, plus supplementary fees of $2.00 per unit. Visa students enrolled in courses for **all other programmes** were assessed at $156.50 per unit tuition fee plus $2.00 per unit supplementary fee.

Residence and Food Service Fees

REGULAR SESSION

Residence fees for students living on campus cover the period, Labour Day to the end of the April examination period.

The fees below are those for 1988-89.

	Payable in **Full**	Payable in **Part**
Residences		
Room *and* Board		
10 Meal Plan	$2,988.00	$2,100.00
14 Meal Plan	3,355.00	2,350.00
19 Meal Plan	3,495.00	2,450.00

Apartments: Per Person (Room *Only*)	$1,505.00	$1,050.00
Food Plan *Only*		
10 Meal Plan	$1,483.00	$1,030.00
14 Meal Plan	1,850.00	1,300.00
19 Meal Plan	1,990.00	1,400.00

Students wishing to make changes in their selection of meal plans may do so up to September 15th. Any changes made after September 15th will be subject to a $25.00 administrative charge. **NO CHANGES** will be accepted after September 29th. Please contact Food Services, Ext. 3837 to make any changes in food plans.

A complete and current schedule of residence charges and payment dates may be obtained upon application to the Residence Admissions Co-ordinator, Commons Building, telephone 525-9140, extension 4223.

The University reserves the right to use the rooms during vacation periods, and the charges do not include the use of the room or the cost of meals during these periods, unless arrangements to the contrary are made.

Students will be assessed for unwarranted breakage.

SUMMER RESIDENCE

McMaster University offers residence, with centralized washroom facilities, to men and women of all ages from early May to late August each year. Only single occupancy is available unless a specific roommate is named.

Room rates include bed linens, weekly service and weekly linen change (but no towels). Parking is extra.

Stays of less than one month are subject to 5% Provincial sales tax. A cash key deposit of $10.00 is collected upon check-in.

The following rates apply for 1989. For further information, contact Conference Services, Commons Building, Room 115, telephone (416) 525-9140, extension 4781.

Single Occupancy	**Cost Per Person**
Individual Nights	$ 18.
Weekly rate	90.
4-week rate*	300.
Double Occupancy	
Individual Nights	$ 14.
Weekly rate	70.
4-week rate*	220.

* Available only if paid in full, in advance.

Payment of Fees

Full-time tuition fees and **residence/food plan** fees are payable in full during the registration period in August/September. Prepayment of fees will significantly simplify the registration process (see below *Prepayment of Fees*). Students unable to make full payment at the time of registration may be registered by paying the minimum first payment which is equal to approximately 70% of the total fee at the time of registration, and the balance no later than January 15. Interest is added monthly to the unpaid balance.

Part-time fees must accompany registration.

Cheques must be made payable to **McMaster University**. Any cheque not accepted and returned by the bank will be subject to an additional administrative charge of $20.00.

Failure to comply with payment dates will result in the University adding interest at the rate of 1.5% per month on overdue fees.

In addition, refusal to pay fees, or any part of the fees, may result in the student being refused admission to the University or being requested to withdraw with all privileges suspended. Fees to the date of withdrawal will be assessed.

No student may be eligible for any examination results, transcripts, or the payment of awards of any kind, until fees and any other accounts owed to the University are paid, or until acceptable arrangements are made.

PREPAYMENT OF FEES

All tuition, supplementary, residence and food plan fees and any debts from prior sessions should be received in the Business office **prior** to registration.

For your payment to appear on University records by the time you register, pre-payment must be received at the University by:

August 1 for Level I students who will be registering in early August;

August 18 for Upper Level students who will be registering in early September.

Students must complete the fee prepayment form and send it together with a cheque, which may be post-dated to September 1, to the Business Office. The student identification number should be written on the back of your cheque. By following this procedure you will significantly reduce the time needed to complete Registration.

Students who are expecting to receive financial assistance under the Ontario Student Assistance Programme or are to be recipients of scholarships, bursaries or other awards, may arrange fee deferments on the day of registration, provided they can show satisfactory evidence that such awards have been granted. All fees are payable upon receipt of financial assistance.

Any known differences between the amount of the award, and minimum first payment must be paid by September 1.

Students being sponsored by outside organizations, e.g. Vocational Rehabilitation Services, R.C.M.P., Canadian Armed Forces, etc., are required to bring copies of fee authorizations at the time of registration.

Students who are unable to pay their fees at the time of registration should contact the Business office Room 208 Gilmour Hall prior to registration.

REFUNDS

Students who are forced by illness or other personal reasons to withdraw from courses are entitled to a partial refund of their fees. A refund schedule is included with the fee schedules which are sent in the summer preceding September registration. Refunds are determined by the date on which notices of withdrawal in writing are received at the office of the Dean of the appropriate Faculty. **All refunds of tuition are reduced by an administrative charge of $50.00 for full-time students and $10.00 per 6 units or part for part-time students.**

Miscellaneous Fees

The following fees were in effect for the 1988-89 academic year, and are over and above assessed academic fees, supplementary fees, and residence fees and food plan fees.

OPTIONAL USER FEES

Transcript (per copy)	$ 1.00
Replacement of Diploma	20.00
Replacement of M.D. and Graduate Diploma	25.00
Letter of Permission	30.00
Late Registration Fee	30.00
Deferred Examination at Another Centre	35.00
Supervision of Examinations for Other Universities	30.00
Examination Reread	30.00
Duplicate Tuition Fee Receipt	5.00
Replacement Student I.D. Card	15.00
Replacement Food Card	
Lost Card	15.00
Misuse of Card	25.00
Picture	2.00
Returned Cheque Charge (NSF, Payment Stopped)	20.00
Instalment Fee	25.00
Residence Withdrawal Fee	25.00
Photocopy of Examination Script	10.00
Athletic Fees (optional for Part-time students) (see also Facility Fees below)	
Full Year	58.00
8 months	47.00
4 months	26.00
Facility Fees (payable by all users)	
Full Year	28.00

8 months	22.00
4 months	16.00
Tennis User Fee	16.00
Athletic Guest fee	5.00
Library charges	
Overdue Recalled Books (per day)	2.00
Overdue Reserve Material (per hour)	2.00
Replacement Costs/Fines ... up to	100.00
Returned Books After Replacement Obtained	10.00
Locker, large	11.50
Locker, small	4.00
Campus Health Service (optional for Part-time (day) students)	11.00
Lesson Fee (for students registered in Music 1E06, 2E06, 3E06 or 4E06). Per lesson...	15.00

EXPENSES

To some extent, expenses are controlled by the student (e.g., clothing, living expenses and amusement). The essential costs for a typical student in Level I not living at home will be approximately $4,500 depending upon the amount the student chooses to pay for room and board.

Costs Other Than Fees For Students in Clinical Courses: Students must buy uniforms, shoes, stockings and uniform accessories, for clinical practice. Uniforms and accessories are ordered under the direction of the School of Nursing and the approximate cost is $100. White shoes and hose are also necessary.

Registration Examinations: Graduates of the B.Sc.N. programme can expect to pay fees ($176.00 in 1986) to write the comprehensive registration examinations administered by the College of Nurses of Ontario.

Insurance of Personal Property on University Premises: The University cannot assume any responsibility for the personal property of any employees, faculty members, or students, nor does the University carry any insurance that would cover their personal property.

In most cases, personal fire insurance policies provide an automatic 10% extension covering property away from home. It is suggested that insurance policies be inspected to be certain that this is the case.

Death and Dismemberment Insurance: The University considers that the purchase of insurance coverage for death and dismemberment is the individual responsibility of its students. It must be remembered that the greater part of a student's day is usually devoted to activities not related to a University course. There are various insurance plans available and although the University does not specifically endorse any one of these plans, it has no objection to the explanatory brochures and literature being posted on bulletin boards or distributed in appropriate places. Students involved in laboratory or field work are particularly encouraged to investigate such coverage.

Student Financial Aid

Financial aid to help students meet the costs of post-secondary education is available from the federal and provincial governments through the Ontario Student Assistance Programme (OSAP) which consists of five plans.

Ontario Study Grant Plan
Canada Student Loans Plan
Ontario Student Loans Plan
Ontario Special Bursary Plan
Ontario Work-Study Plan

To be eligible for assistance under each of these plans, a student must be a Canadian citizen or permanent resident of Canada and fulfill certain requirements for residency in Ontario. The amount of financial aid awarded is determined by a need-testing procedure.

It is strongly recommended that students apply by June 30th to ensure that their applications are processed by September. It currently takes 8-10 weeks to process a normal OSAP application.

All of the government programs described in this text are modified and restructured annually to reflect the changing needs of students from the Province of Ontario. It is therefore recommended that you discuss your specific financial requirements with a counsellor in the Student Financial Aid Office as early as possible.

ONTARIO STUDY GRANT PLAN

A plan which primarily helps students from less affluent families complete undergraduate work and not incur significant debt. Grants under this plan are not contingent upon a student taking a government loan and are limited to a student's first eight academic terms of post-secondary study. After that, generally at professional or graduate levels of study, students are expected to assume more responsibility for educational costs or to turn for assistance to student loans plans outlined below.

Grants are available to both full-time and part-time students, who are resident in Ontario, and enrolled at recognized post-secondary institutions anywhere in Canada.

CANADA STUDENT LOANS PLAN

A federal government plan, administered by the provincial government, which provides loans to needy students for completion of any level of study. Maximum assistance under this plan is about 60% of standard costs at an Ontario institution.

Loans are available to full-time students enrolled at recognized post-secondary institutions anywhere in the world.

The federal government recently expanded its Canada Student Loans Plan to include loans for needy part-time students. These loans cover a student's costs for tuition, books, transportation, day care and incidentals and are interest bearing after 30 days.

ONTARIO STUDENT LOANS PLAN

A plan which provides loans to full-time students whose financial needs are not fully covered by the Canada Student Loans Plan. This plan also helps part-time students or students enrolled in programmes not eligible for the Canada Student Loans Plan.

Loans are available to students enrolled at recognized post-secondary institutions in Ontario only.

ONTARIO SPECIAL BURSARY PLAN

A plan which helps exceptionally needy students (usually single parents) who are unable to attend school full-time but need post-secondary training to improve their job prospects. A student participating in this plan will not receive assistance through the Ontario Study Grant Plan.

Bursaries are available to such part-time students enrolled at recognized post-secondary institutions in Ontario only.

ONTARIO WORK-STUDY PLAN

A recent addition to the OSAP package which is intended to complement the original four plans. It offers part-time jobs to needy students during the school year to help them meet exceptional costs, often unexpected, not recognized under OSAP. It also helps students who lack the resources expected under OSAP criteria or, whose assessed need under OSAP is not met because of grant/loan maximums or, who do not wish to borrow further due to high debt load. To be eligible, students must have applied for and received some OSAP funding in the current year.

Costs of this plan are shared equally by the provincial government and a local sponsoring agency which must be a non-profit organization, such as the university.

For information and applications contact:

Student Financial Aid and Scholarships Office
Hamilton Hall, Room 401
McMaster University
Hamilton, Ontario L8S 4K1
Telephone: (416) 525-9140, extension 4319
John Edwards, *Director*
Denise Ellis, *Financial Aid Coordinator*

Students should also refer to the section *Supplementary Student Financial Aid* in this calendar for information about bursaries and loans.

Degrees and Programmes

McMaster University offers the following undergraduate degrees:

FACULTY AND DEGREE	Duration in Years
Arts and Science Programme	
B.Arts Sc.	3
B.Arts Sc. (Honours)	4
(with the exception of the combined Honours degrees in Biology and Physics which require 5 years of study.)	
Faculty of Business	
B.Com.	4
B.Com. (Honours)	4
B.Com.& Arts (Honours)	4
Faculty of Engineering	
B.Eng.	4
(with the exception of Civil Engineering and Computer Systems which requires 5 years of study.)	
B.Eng.Mgt.	5
Faculty of Health Sciences	
B.H.Sc.	1
B.Sc.N.	4
(In addition, the B.Sc.N. in available as a 2-year programme to those holding the R.N. Diploma)	
M.D. (Doctor of Medicine)	3
(The M.D. Degree is taken after at least three years of undergraduate study.)	
Faculty of Humanities	
B.A.	3
B.A. (Honours)	4
B.Mus.	4
Faculty of Science	
B.Sc.	3
B.Sc. (Major)	4
B.Sc. (Honours)	4
Faculty of Social Sciences	
B.A.	3
B.A. (Honours)	4
B.A. (Major)	4
B.P.E.	4
B.A./B.S.W.	4
B.S.W. (as a Second Degree)	2

Second Undergraduate Degree

Provision exists for a university graduate to take a second bachelor's degree. This programme is normally shortened. An application for admission is necessary for entry to a second degree programme, and it should be submitted by the application deadlines. (See *Application Procedures* and *Academic Regulations, Second Bachelor's Degree Programmme.*)

Combined Programmes

There is the opportunity to combine two subjects of study within one Faculty, or between two Faculties. Further information can be obtained by referring of the Faculty Sections of this Calendar, or contacting the appropriate Associate Dean (Studies).

Courses Instructed in French

In order to facilitate the intellectual development of students in the French language, the University will attempt to offer one or two courses annually where French is the language of instruction. These courses are open to all students providing they have the necessary prerequisite, and a suitable working knowledge in the French language.

ELECTIVE COURSES AVAILABLE TO LEVEL I STUDENTS

The following is a list of courses available as Electives to Level I students, provided that the student has met any prerequisites, and subject to enrolment limitations. Normally, a student may select up to 6 units in any particular subject (excluding Mathematics, of which up to 12 units may be taken). A brief description of each course can be found under the appropriate Department within the section *Courses Listing* in this Calendar.

	Anthropology	1A03, 1B06, 1Z03
★ †	Art	1C03
	Art History	1A06
★ †	Biology	1G06
	Canadian Studies	1A06
★ †	Chemistry	1C03
★ †	Chinese	1Z06
	Classical Civilization	1A06
	Comparative Literature	1A06
★	Computer Science	1MA3, 1MB3, 1ZA3
	Drama	1A06
	Economics	1A06
★	English	1D06
	French	1A06, 1B06, 1Z06
★	Geography	1A06
	Geography	1B06, 1D06
★ †	Geology	1A03, 1C03
	German	1A06, 1Z06, 2Z06
	Gerontology	1A06
★	Greek	1Z06
	Hispanic Studies	1A06, 1Z06
	History	1C06, 1D06, 1L06
	Humanities	1C03, 2B06
	Italian	1A06, 1Z06, 1ZZ6
★	Japanese	1Z06
	Labour Studies	1AA3, 1A03
★	Latin	1Z06
	Linguistics	1A06
★ †	Mathematics	1A06, 1B03, 1C06, 1K03, 1L03, 1M03
★	Materials	1A03, 1B03
	Music	1A06
	Philosophy	1B06, 1D06
★	Physics	1A06, 1B06, 1C06
★	Polish	1Z06
	Political Science	1A06
	Psychology	1A06
	Religious Studies	1B06, 1D06, 1E06, 1F06, 1H03
	Russian	1Z06
★	Serbo-Croatian	1Z06
	Sociology	1A06

★ These courses are **not** acceptable for the 6-unit complementary studies elective required in Engineering I.

† These courses are **not** acceptable for the 6 units of Humanities, Social Sciences, or Science electives required in Natural Sciences I.

Degrees by Programme

Subject	Bachelor's Degree	Major Degree	Honours Degree	Combined Honours Degree	Professional Degree
Anthropology	B.A.★		B.A.★	B.A.★	
Applied Chemistry			B.Sc.		
Applied Physics			B.Sc.		
Art			B.A.	B.A.	
Art History	B.A.★		B.A.★	B.A.★	
Arts and Science	B. Arts Sc.		B. Arts Sc.	B. Arts Sc.	B. Arts Sc./B.S.W.
Asian Studies ×					
Biochemistry		B.Sc.	B.Sc.	B.Sc.	
Biology	B.Sc.	B.Sc.	B.Sc.	B.Sc.; B.A.	
Biotechnology & Genetic Engineering			B.Sc.		
Business					B.Com.(Hon.) B.Com. B.Com.&Arts (Hon.)
Canadian Studies ×					
Ceramic Engineering					B.Eng., B.Eng.Mgt.†
Chemical Engineering					B.Eng., B.Eng.Mgt.
Chemistry	B.Sc.	B.Sc.	B.Sc.	B.Sc.	
Chinese ×					
Civil Engineering and Computer Systems					B.Eng.
Civil Engineering and Engineering Mechanics					B.Eng., B.Eng.Mgt.
Classical Studies	B.A.★		B.A.★	B.A.★	
Classics			B.A.		
Commerce					B.Com. B.Com.(Hon.) B.Com.&Arts (Hon.)
Comparative Literature			B.A.	B.A.	
Computer Engineering					B.Eng., B.Eng.Mgt.
Computer Science	B.Sc.	B.Sc.	B.Sc.	B.Sc.; B.A.	
Croatian ×					
Drama	B.A.★		B.A.★	B.A.★	
Economics	B.A.★		B.A.★	B.A.	
Eighteenth Century Studies ×					
Electrical Engineering					B.Eng., B.Eng.Mgt.
Engineering Physics					B.Eng., B.Eng.Mgt.
English	B.A.★		B.A.★	B.A.★	
Film ×					
French	B.A.		B.A.	B.A.	
Geography	B.A.★; B.Sc.★		B.A.★; B.Sc.★	B.A.★; B.Sc.	
Geography and Environmental Sciences†			B.Sc.		
Geography and Environmental Studies†			B.A.		
Geology	B.Sc.	B.Sc.	B.Sc.	B.A.; B.Sc.	
German				B.A.	
Gerontology	B.A.(combined)			B.A.	
Greek ×					
Health and Radiation Physics		B.Sc.	B.Sc.		
Hebrew ×					
Hispanic Studies				B.A.	
History	B.A.★		B.A.★	B.A.★	
Humanities (Interdisciplinary Studies)	B.A.				
Italian				B.A.	
Japanese ×					
Labour Studies	B.A.★		B.A.★		
Latin ×					
Life Sciences				B.Sc.	
Linguistics			B.A.		
Manufacturing Engineering					B.Eng.
Materials Engineering					B.Eng., B.Eng.Mgt.†
Materials Science		B.Sc.	B.Sc.		
Mathematics	B.Sc.★	B.Sc.	B.Sc.	B.Sc.; B.A.	
Mechanical Engineering					B.Eng., B.Eng.Mgt.
Medicine					M.D.
Metallurgical Engineering					B.Eng., B.Eng.Mgt.†
Modern Languages and Linguistics			B.A.		
Molecular Biology and Biotechnology			B.Sc.		
Music	B.A.		B.Mus.	B.A.	
Nursing					B.Sc.N.
Occupational Therapy					B.H.Sc.
Peace Studies ×					
Pharmacology†				B.Sc.	
Philosophy	B.A.★		B.A.★	B.A.★; B.Sc.	
Physical Education					B.P.E.
Physics	B.Sc.	B.Sc.	B.Sc.	B.Sc.	
Physiotherapy					B.H.Sc.
Polish ×					
Political Science	B.A.★		B.A.★	B.A.★	
Psychology	B.A.★; B.Sc.★	B.A.★; B.Sc.★	B.A.★; B.Sc.★	B.A.★; B.Sc.★	
Religious Studies	B.A.★		B.A.★	B.A.★	
Russian				B.A.★	
Sanskrit ×					
Science	B.Sc.★				
Serbo Croatian ×					
Social Work					B.A./B.S.W., B.S.W.
Sociology	B.A.★		B.A.★	B.A.★	
Statistics		B.Sc.	B.Sc.		

★ degree programme is available through a combination of evening and summer study.

† degree programme is pending approval.

× course areas not offered as degrees.

Arts and Science Programme

H.M. Jenkins/B.A., Ph.D., *Director*

The Arts and Science Programme has been designed for students who wish to use their university years to further their intellectual growth through a study of the methods of inquiry, and significant achievements in both arts and sciences. The Programme also allows for substantial specialization in a discipline or problem area through the use of electives. A.N. Whitehead expressed the philosophy of the Arts and Science Programme when he wrote:

> What education has to impart is an intimate sense for the power of ideas, for the beauty of ideas, and for the structure of ideas, together with a particular body of knowledge which has peculiar reference to the life of the being possessing it.
>
> (The Aims of Education and Other Essays, 1929).

The core curriculum consists of courses offered by the Council of Instructors of the Arts and Science Programme, together with other courses offered by Departments. The core curriculum is designed to meet three major objectives:

1. to increase understanding of biological and physical sciences, behavioural sciences, technology, and the arts;
2. to develop skill in the use of the written and spoken word, and in quantitative reasoning; and
3. to foster the art of practical inquiry into problems of public concern.

Meeting the last of these objectives is the aim of inquiry seminars which begin in Level I and continue in upper levels. To investigate with skill and insight a serious public issue, such as world population growth in relation to food supply, requires an understanding of the methods and findings of many disciplines; it calls on a liberal education. Moreover, acquiring skill in such investigations requires practice in formulating issues, searching out evidence, and bringing the insights of academic disciplines to bear on the interpretation of evidence. Developing the art of practical inquiry is an important goal of the Arts and Science Programme.

The Programme offers preparation for advanced study in many professional schools including those of law, medicine, health administration, business, and journalism.

Students in this Programme who wish to prepare for graduate study in an academic discipline should consult with the appropriate department concerning requirements. In general, preparation for graduate study may be accomplished by combining the honours core Arts and Science curriculum with a concentration of electives in the intended area of graduate study.

Combined honours programmes which are available in many subjects (see specific programme descriptions below), combine the core curriculum of the Arts and Science Programme with a prescribed set of courses in a subject. Completion of a combined honours programme can be expected to satisfy course requirements for admission to graduate study in the particular subject. Students are advised, however, to contact the Department in which they are contemplating graduate study to obtain information on admission requirements.

Students who plan to seek employment directly upon graduation may wish to consider concentrating their electives in such work-related subjects as economics, psychology, computer science, business or applied mathematics.

Academic Regulations

The Arts and Science Programme is governed by the General Academic Regulations of the University, (see the *Academic Regulations* section of this calendar) and the regulations described below.

The Programme **begins in Level I** and leads to the degree, Bachelor of Arts and Science (B. Arts Sc.) on completion of Level III or B. Arts Sc. (Honours) on completion of Level IV. The four-level Programme provides an increased opportunity for specialization through electives and through an individual study or thesis course. Continuation in the Programme requires honours-level performance, and the requirements for Level III are the same whether or not Level IV is undertaken.

Registration in Level I of the Arts and Science Programme is limited to approximately fifty students.

Inquiry Seminar Requirements

Inquiry seminars are comprised of Arts and Science 1C06 and a variety of topics offered as Arts and Science 3C06. Arts and Science 1C06 **must** be completed in Level I.

Students intending to complete the B. Arts Sc.(Honours) degree are required to complete 12 units of upper-level inquiry seminars as either two topics of Arts and Science 3C06, or one topic of Arts and Science 3C06 and an additional 6 units in a course or courses approved by the Director that study another age or culture.

Students intending to complete the B. Arts Sc. degree are required to complete 6 units of an upper-level inquiry seminar as one topic of Arts and Science 3C06. An additional 6 units (one topic) of inquiry seminar may be taken as an elective.

Combined Honours

Students in the Arts and Science Programme may undertake combined honours programmes in many disciplines within the Faculties of Social Sciences, Humanities or Science. The combined programmes with Physics and with Biology are five-level programmes. Combined programmes that are already established are described below. Students are encouraged to consult the Director of the Arts and Science Programme for consideration of other possible combinations.

Registration: Registration in each level of any combined honours programmme requires the written approval of the Director of the Arts and Science Programme **and** the appropriate Departmental Counsellor.

Individual Study/Thesis: Students in the B. Arts Sc.(Honours) Programme are required to complete either Individual Study or Thesis (Arts and Science 4A06, or 4C06). This requirement can be, and in some cases must be, met by a Department course in the combined discipline.

Level I Standing

Level I standing is computed as a weighted average of the best 80% of the 30 units of Level I work. *Continuation beyond Level I* requires a weighted average of *at least 7.0*. In the case of some combined honours programmes, the weighted average must include specified courses. These courses are indicated in the programme descriptions below.

Continuation Beyond Level II

For students in the B. Arts Sc.(Honours) and B. Arts Sc. Programmes, *continuation beyond Level II* requires a Cumulative Area Average (CAA) of *at least 7.0*.

For students in a combined programme of Arts and Science and Another Subject, continuation beyond Level II requires an **overall** CAA of at least 7.0 in all courses taken in Levels II, III and IV, **and** a CAA of at least 7.0 in the work taken in the combined discipline.

Area Courses

All courses completed by students who are in Level II, III, IV or V are Area courses unless designated as *extra* at the time of registration, or otherwise stated in the Programme descriptions below.

Programme Probation

A student whose Cumulative Area Average is less than 7.0 but no lower than 6.5, and who has not been placed on probation before, may be granted Programme Probation at the discretion of the Director. A student whose Cumulative Area Average is less than 6.5 will not be granted Programme Probation.

Graduation Average

The Graduation Average for all Arts and Science programmes will include Arts and Science 2A06 and 2D06. For combined programmes, a single Graduation Average will be computed.

Arts and Science Programmes

B. ARTS SC.(HONOURS) AND B. ARTS SC.

Level I: 30 units

R Arts and Science 1A06, 1B06, 1C06, 1D06; Biology 1A06. (Biology 1A06 must be completed by the end of Level II.)

E Electives to a total of 30 units.

Level II: 30 units

R Arts and Science 2A06, 2D06; Arts and Science 3C06 (may be taken in Level III); six units from Arts and Science 2R06, Statistics 2D03, 2M03, Computer Science 1MA3 or 1ZA3, Mathematics 1B03; Biology 1A06 (if not completed in Level I).

E Electives to a total of 30 units.

Level III: 30 units

R Arts and Science 3B06, either 3A06 or 3D06, and 3C06 (if not already completed).

E Electives to a total of 30 units. Students enrolled in B. Arts Sc. may include an additional topic of Arts and Science 3C06 as an elective if one topic was completed in Level II.

Level IV: 30 units

R Arts and Science 3A06 or 3D06 (whichever not completed in Level III); an additional topic from Arts and Science 3C06, if not completed, or a course or courses approved by the Director; 6 to 12 units from Arts and Science 4A06, 4A12, 4C06, 4C12.

E Electives to a total of 30 units.

Arts and Science Programme and Another Subject

Established combined programmes are described below. Students are encouraged to consult the Director of the Arts and Science Programme for consideration of other possible combinations.

HONOURS ARTS AND SCIENCE AND ANTHROPOLOGY

Continuation Beyond Level I:

Students must achieve a Level I standing of at least 7.0 in the best 80% of the 30-33 units of Level I work including at least 7.0 in either Anthropology 1A03 and 1Z03 or an average of at least 7.0 in Anthropology 1B06 and 1A03 or 1Z03.

Programme Note:

The Anthropology component includes a study of the **four major subfields** of Social/Cultural Anthropology, Physical/Biological Anthropology, Archaeology, and Linguistics.

Students must complete at least 3 units above Level I in each of the major subfields. Students may specialize in any one of these subfields though it is not necessary to do so. It should be noted, however, that each subfield has its own sequence of courses and prerequisites. Students should consult with the Departmental Counsellor concerning the specific courses related to each subfield.

Area Courses:

Level II, III and IV Anthropology courses.

Level I: 30-33 units

R Arts and Science 1A06, 1B06, 1C06, 1D06;
Anthropology 1A03 and 1Z03, or 1B06 and 1A03 or 1Z03.

Level II, III, IV: 90 units

R Arts and Science 2A06, 2D06, 3A06, 3B06, 3D06; 12 units from Arts and Science 3C06; Arts and Science 4A06 or 4C06, or Anthropology 4G03, which may be repeated if on a different topic, or extended to 6 units on the same topic;

Biology 1A06; six units from Arts and Science 2R06, Statistics 2D03, 2M03, Computer Science 1MA3 or 1ZA3, Mathematics 1B03;

30 units of Anthropology Area courses including 9 units of Level IV Anthropology courses and Anthropology 2F03, 3S06, 4I03.

HONOURS ARTS AND SCIENCE AND BIOCHEMISTRY

Admission:

Students must achieve a Level I standing of at least 7.0 in the best 80% of the 30 units of Level I work and at least an average of 7.0 in Arts and Science 1D06 and Chemistry 1A06.

Area Courses:

Biochemistry 2A03, 3A06, 3L06, 4A03, 4B06, 4D03, 4E03, 4I03, 4M03, 4P03; Biology 2B03, 2C03; Chemistry 2O06, 2Q06, 3F03.

Programme Note:

Biochemistry 2A03 will be included in calculating the Graduation Average.

Level I: 30 units

R Arts and Science 1A06, 1B06, 1C06, 1D06; Chemistry 1A06

Level II: 30 or 33 units

R Arts and Science 2A06; Arts and Science 2R06 or Statistics 2M03 and Computer Science 1MA3 or 1ZA3; Biochemistry 2A03; Biology 1A06 (or Biology 2B03, if Biology 1A06 is completed); Chemistry 2O06, 2Q06.

Level III: 30 or 33 units

R Arts and Science 2D06, 3A06; Biochemistry 3A06, 3L06; Biology 2B03 (if not completed), 2C03; Chemistry 3F03.

Level IV: 33 units

R Arts and Science 3B06, 3C06, 3D06; Biochemistry 4B06 or 4P03 and 4A03, 4E03, two of Biochemistry 4D03, 4I03 and 4M03.

HONOURS ARTS AND SCIENCE AND BIOLOGY

Admission:

Students must achieve a Level I standing of at least 7.0 in the best 80% of the 30 units of Level I work, and at least a 7.0 in one of Arts and Science 1D06 or Chemistry 1A06.

Programme Notes:

1. **Continuation** in the programme beyond Level II requires at least 7.0 in Biology 1A06.
2. Students are advised to note carefully the prerequisites for all Level III and IV courses listed in the programme, particularly Biochemistry 3B03, 3C03 and 3G06.
3. In Levels IV and V students may elect either the Whole Organism Option or the Cell, Molecular Biology, Genetics Option.

Area Courses:

All Level II, III, and IV Biology courses; Biochemistry 3B03, 3C03, 3G06, 4D03, 4E03, 4M03; Engineering 4X03; Geography 3P03, 4P03; Geology 2J03, 3D06, 3J03, 4D03, 4F03; Psychology 3F06, 3R03, 3S03, 3T03.

Level I: 30 units

R Arts and Science 1A06, 1B06, 1C06, 1D06; Chemistry 1A06

Level II: 30 units

R Arts and Science 2A06, 2D06, 2R06; Biology 1A06; Chemistry 2O06

Level III: 30 units

R Arts and Science 3B06, 3C06; 12 units from Biology 2B03, 2C03, 2D03, 2E03, 2F03; Biochemistry 3G06.

Level IV: 30 units *Whole Organism Option (OPTION A)*

R Arts and Science 3A06 or 3D06; Biology 3U06, or 4B03/4B06, or 3SS3 and 3TT3; Biology 3N06, one of Biology 3A06, 3F06, 3K06; Biology 3I03 or 3J03.

E 3 to 6 units.

Level V: 30 units

R Arts and Science 3A06 or 3D06 (whichever not completed), 3C06, 4C06; Biology 4D03 or 4X03; 6 units of Level III or Level IV Biology courses

E 3 units.

Level IV: 30 units *Cell, Molecular Biology, Genetics Option (OPTION B)*

R Arts and Science 3A06 or 3D06; Biology 3E03, 3H03, 3HH3, 3I03, 3J03, 3N06, 3O03

Level V: 30 units

R Arts and Science 3A06 or 3D06 (whichever not completed), 3C06, 4C06; 6 units from Biology 4N03, 4M03, 4MM3; Biology 4I03 or 4V03; 3 units of Level IV Biology courses.

HONOURS ARTS AND SCIENCE AND COMPUTER SCIENCE

Continuation Beyond Level I

Students must achieve a Level I standing of at least 7.0 in the best 80% of the 30 units of Level I work including Arts and Science 1D06, and Computer Science 1MA3 and 1MB3.

Programme Note:

Because of resource limitations, **enrolment** in Computer Science and all joint programmes involving Computer Science is **limited**. Students intending to enrol in this programme should consult the Department of Computer Science and Systems.

Area Courses:

All Level II, III, IV Computer Science courses except 2ME3, 2SB3, 2ZB3, 4I03.

Level I: 30 units

R Arts and Science 1A06, 1B06, 1C06, 1D06;
Computer Science 1MA3 and 1MB3.

Level II: 33 units

R Arts and Science 2A06, 2D06; Biology 1A06;
Statistics 2D03 or 2M03; Mathematics 1B03;
Computer Science 2MF3; Computer Science 2MC3, 2MD3.

Level III: 33 units

R Arts and Science 3A06, 3B06, 3C06;
Computer Science 2ME3 or 2MJ3, 3MG3, 3MH3, 3MI3 and one of 3CA3, 3EA3, 3IA3.

Level IV: 30 units (1989-90)

R Arts and Science 3D06, 3C06;
Computer Science 4G06 and 9 additional units of Level III or IV Computer Science courses.

E 3 units.

Level IV: 30 units (commencing 1990-91)

R Arts and Science 3D06, 3C06;
Computer Science 4MP6 and 9 additional units of Level III or IV Computer Science courses, including Computer Science 3EA3 if not already taken.

E 3 units.

HONOURS ARTS AND SCIENCE AND DRAMA

Admission:

Students must achieve a Level I standing of at least 7.0 in the best 80% of the 30 units of Level I work, including a grade of at least B– in Drama 1A06.

Programme Note:

Students in Drama must include a minimum of 3 units of work from at least 3 of the 4 Fields of Study (See *Programme Notes under Drama)*.

Area Courses:

All Level II, III, and IV Drama courses.

Level I: 30 units

R Arts and Science 1A06, 1B06, 1C06, 1D06; Drama 1A06.

Level II: 30 units

R Arts and Science 2A06; six units from Arts and Science 2R06, Statistics 2D03, 2M03, Computer Science 1MA3 or 1ZA3, Mathematics 1B03; Biology 1A06; 12 units Level II Drama.

Level III: 30 units

R Arts and Science 2D06, 3A06, 3C06; 12 units Level III/IV Drama.

Level IV: 30 units

R Arts and Science 3B06, 3C06, 3D06; 12 units Level III/IV Drama which must include at least one Level IV Drama course approved as the Arts and Science Programme Individual Study/Thesis requirement.

HONOURS ARTS AND SCIENCE AND ECONOMICS

(There are two options of study for this combined programme described as **Option A** or **Option B**.)

Admission:

Option A requires a *Level I* standing of at least 7.0, with at least 7.0 in Economics 1A06.
Option B requires a *Level II* Cumulative Area Average of at least 7.0, with at least 7.0 in Economics 1A06.

Programme Note:

For both Options A and B, a Single Graduation Average will be calculated on the basis of all Level II, III and IV Economics courses and all Level III and IV Arts and Science courses, and Arts and Science 2A06 and 2D06.

Area Courses:

All Level II, III, and IV Economic courses.

Option A:

Level I: 30 units

R Arts and Science 1A06, 1B06, 1C06, 1D06;
Economics 1A06.

Level II: 30 units

R Arts and Science 2A06, 2D06; Biology 1A06;
Economics 2L06, 2M06.

Level III: 30 units

R Arts and Science 3A06, 3B06, 3C06;
one of Economics 3O06, Arts and Science 2R06; 6 additional units of Economics.

Level IV: 30 units

R Arts and Science 3D06 and 3C06;
Economics 3A03, 3AA3, 4M06 and 6 additional units of Economics.

Option B:

Level I: 30 units

R Arts and Science 1A06, 1B06, 1C06, 1D06; Biology 1A06.

Level II: 30 units

R Arts and Science 2A06, 2D06, 2R06; Economics 1A06.

E 6 units. Mathematics 2L03 is recommended.

Level III: 30 units

R Arts and Science 3A06, 3B06, 3C06;
Economics 2L06, 2M06.

Level IV: 30 units

R Arts and Science 3C06, 3D06;
Economics 3A03, 3AA3, 4M06 and 6 additional units of Economics.

HONOURS ARTS AND SCIENCE AND ENGLISH

Continuation Beyond Level I:

Students must achieve a Level I standing of at least 7.0 in the best 80% of the 30 units of Level I work including at least 7.0 in English 1D06.

Programme Note:

Completion of the English component of this combined programme requires a minimum of 6 units of work from five of the six English **subfields**. Students should consult with the Departmental Counsellor concerning the specific courses related to each subfield.

Area Courses:
English 2B06, 2G06, 2H06, 2I06, 2V06, 3D03, 3DD3, 3I03, 3K06, 3Q03, 3QQ3, 3T03, 3V06, 4B06, 4E06, 4L03, 4M03, 4N06.

Level I: 30 units

R Arts and Science 1A06, 1B06, 1C06, 1D06;
English 1D06.

Levels II, III and IV: 90 units

R Arts and Science 2A06, 2D06, 3B06, 3D06, and 4A06 or 4C06; 12 units from Arts and Science 3C06;

Biology 1A06; 6 units from Arts and Science 2R06, Statistics 2D03, 2M03, either Computer Science 1MA3 or 1ZA3, Mathematics 1B03;

36 units of English Area courses, including 12 units Level II, 12 units Level III and 12 units Level IV.

HONOURS ARTS AND SCIENCE AND FRENCH

Continuation Beyond Level I:
Students must achieve a Level I standing of at least 7.0 in the best 80% of the 30 units of Level I work including at least B– in French 1A06 or at least B in French 1B06.

Area Courses:
All Level II, III, IV French courses, except French 3Y03.

Level I: 30 units

R Arts and Science 1A06, 1B06, 1C06, 1D06;
French 1A06 or 1B06.

Levels II, III and IV: 90 units

R Arts and Science 2A06, 2D06, 3B06, 3D06; 12 units from Arts and Science 3C06;

Biology 1A06; 6 units from Arts and Science 2R06, Statistics 2D03, 2M03, either Computer Science 1MA3 or 1ZA3, Mathematics 1B03;

36 units of French including 12 units French Language Practice including 2A03, 3C03, 4A03, 18 units French/Francophone Literature including one of 2J03, 2JJ3, one of 2W03, 2WW3, one of 3K03, 3KK3, one of 3Q03, 3QQ3, and two 3-unit Level IV French courses approved as replacement for Arts and Science 4A06 or 4C06.

E 6 units.

HONOURS ARTS AND SCIENCE AND GEOGRAPHY

Continuation Beyond Level I:
Students must achieve a Level I standing of at least 7.0 in the best 80% of the 30 units of Level I work including at least 7.0 in 6 units of Level I Geography.

Programme Note:
Students will normally select Area courses in Geography from one of the two major **subfields** of Physical Geography or Human Geography. Students should consult with the Departmental Counsellor concerning the specific courses related to each subfield.

Area Courses:
All Level II, III and IV Geography courses.

Level I: 30 units

R Arts and Science 1A06, 1B06, 1C06, 1D06;
Geography 1A06 or 1B06.

Level II, III, IV: 90 units

R Arts and Science 2A06, 2D06, 3A06, 3B06, 3D06; 12 units from Arts and Science 3C06; Biology 1A06;

42 units of Geography Area courses including Geography 2LL3 and 2L03, and 24 units from Levels III and IV Geography courses, including Geography 4C06.

HONOURS ARTS AND SCIENCE AND GERMAN

Continuation Beyond Level I:
Level I standing of at least 7.0, including a grade of at least B in German 1A06 for *Alternative A*, or a grade of at least A– in German 1Z06 for *Alternative B*.

Programme Note:
With the approval of the Department of Modern Languages and of the Associate Dean of Humanities and the Director of the Arts and Science Programme, Level III of Honours German may be replaced by courses of study at university in a German-speaking country. Students who plan to spend their third year abroad must have a CAA of at least B in *each* of German and Arts and Science in their second year.

Area Courses:

Alternative A: Level II, III and IV German courses.

Alternative B: Level II, III and IV German courses, excluding German 2Z06.

Level I: 30 units

R Arts & Science 1A06, 1B06, 1C06, 1D06; German 1A06 or 1Z06.

Levels II, III and IV: 90 units

R Arts & Science 2A06, 2D06, 3B06, 3D06, 12 units from Arts & Science 3C06;

Biology 1A06; six units from Arts & Science 2R06, Statistics 2D03, 2M03, either Computer Science 1MA3, or 1ZA3, Mathematics 1B03;

Alternative A (for students entering with German 1A06): 36 units of German, which must include 24 units of Level III or IV German courses.

Alternative B (for students entering with German 1Z06): German 2A03, 2B03, 2E03, 2G03, 2Y06, 2Z06 and 12 additional units of Level III and IV German courses.

Note: For *both* Alternative A and Alternative B, 6 units taken in Level IV must be approved as a substitute for Arts & Science 4A06 Individual Study/4C06 Thesis.

E 6 units

HONOURS ARTS AND SCIENCE AND GERONTOLOGY

Admission:
Students must achieve a Level I standing of at least 7.0 in the best 80% of the 30 units of Level I work, including Gerontology 1A06.

Area Courses:
Level II, III and IV Gerontology Area courses, and all designated Gerontology Area courses: Anthropology 3Q03; Health Sciences 3B04, 4C03, 4D03; History 3EE3; Philosophy 3C03; Religious Studies 2A06, 2WW3; Social Work 3C03, Sociology 3G03, 3HH3, 3X03; or other designated and approved Area courses.

Level I: 30 units

R Arts and Science 1A06, 1B06, 1C06, 1D06; Gerontology 1A06.

Level II, III and IV: 90 units

R Arts and Science 2A06, 2D06, 3A06, 3B06, 3D06, 12 units from Arts and Science 3C06;

Biology 1A06; 6 units from Arts and Science 2R06, Statistics 2D03, 2M03, either Computer Science 1MA3 or 1ZA3, Mathematics 1B03;

36 units of Gerontology Area courses including Gerontology 2A03, 3B03, 3C03; one of Gerontology 2B03 or 3D03; Gerontology 4A06; 18 units of Gerontology Area courses.

HONOURS ARTS AND SCIENCE AND HISTORY

Continuation Beyond Level I:
Students must achieve a Level I standing of at least 7.0 in the best 80% of the 30 units of Level I work including at least 7.0 in any Level I History course.

Programme Notes:

1. By the end of Level III, students must take at least 6 units in each of three of the following six **fields** of History: European, Ancient, Asian, Canadian, British, and the Americas (excluding Canada). All Level I, II and III History courses may be used towards this requirement.
2. No Level IV seminars may be taken before completion of 12 units of History beyond Level I.

Area Courses:
All Level II, III, IV History courses.

Level I: 30 units
R Arts and Science 1A06, 1B06, 1C06, 1D06;
6 units of Level I History

Levels II, III and IV: 90 units
R Arts and Science 2A06, 2D06, 3A06, 3B06, 3D06; 12 units from Arts and Science 3C06;
Biology 1A06; 6 units from Arts and Science 2R06, Statistics 2D03, 2M03, either Computer Science 1MA3 or 1ZA3, Mathematics 1B03.
36 units of History courses including 12 units of Level II courses, 12 units of Level III courses, and 12 units of Level IV courses.

HONOURS ARTS AND SCIENCE AND MATHEMATICS

Continuation Beyond Level I:
Students must achieve a Level I standing of at least 7.0 in the best 80% of the 30 units of Level I work including a weighted average of 7.0 in Arts and Science 1D06 or Mathematics 1A06, and one of Mathematics 1B03, 1B04, or 1G04.

Area Courses:
All Level II, III, IV Mathematics and Statistics courses.

Level I: 30-33 units
R Arts and Science 1A06, 1B06, 1C06, 1D06;
Mathematics 1B03;
Biology 1A06 (may be taken in Level II).
E 3 units, if Biology 1A06 not taken in Level I.

Level II: 30-36 units
R Arts and Science 2A06, 2D06;
Statistics 2D03 or 2M03 or Arts and Science 2R06 if Biology 1A06 completed in Level I; Mathematics 2A06, 2B06, 2F03;
Biology 1A06 (if not completed in Level I).

Level III: 33-36 units
R Arts and Science 3A06, 3B06, 3C06;
Mathematics 3A06, 3E03, 3EE3, and 3 to 6 units from 2C03, 3B03, 3F03, 3FF3, 3H03, 3L06, 3P03, 3Q03, 3RR3 Statistics 3D06.

Level IV: 30-36 units
R Arts and Science 3D06, 3C06, one of 4A06 or 4C06;
one of Mathematics 2C03, 3B03, 3F03, 3FF3, 3H03, 3L06, 3P03, 3Q03, and 9 to 12 additional units of Mathematics or Statistics from Mathematics 4A06, 4B06, 4C03, 4E03, 4J03, 4K03, 4Q03, 4RR3, 4S03, 4V06, Statistics 4M03.

HONOURS ARTS AND SCIENCE AND PHILOSOPHY

Continuation Beyond Level I:
Students must achieve a Level I standing of at least 7.0 in the best 80% of the 30 units of Level I work.

Programme Note:
Philosophy 2C06 will be included in calculating the Graduation Average.

Area Courses:
All Level II, III, IV Philosophy courses.

Level I: 30 units
R Arts and Science 1A06, 1B06, 1C06, 1D06; Biology 1A06.

Levels II, III, IV: 90 units
R Arts and Science 2A06, 2D06, 3A06, 3B06, 3D06; 12 units from Arts and Science 3C06; 6 units from Arts and Science 2R06, Statistics 2D03, 2M03, either Computer Science 1MA3 or 1ZA3, Mathematics 1B03;
36 units of Philosophy including: Philosophy 2A06 and 2C06, 3W03 and 4W03 or 4Z06, and 18 units of Level III and IV Philosophy.
E 6 units

HONOURS ARTS AND SCIENCE AND PHYSICS

Admission:
Students must achieve a Level I standing of at least 7.0 in the best 80% of the 33 units of Level I work, and at least a 7.0 in Arts and Science 1D06 or Mathematics 1A06.

Programme Note:
Continuation in the programme beyond Level II requires at least 7.0 in Physics 1A06 or 1B06.

Area Courses:
All Level II, III, IV Physics courses and Mathematics 2A06, 2G03, 2O03, 3C03, 3D03.

Level I: 33 units
R Arts and Science 1A06, 1B06, 1C06; Arts and Science 1D06 or Mathematics 1A06; Physics 1A06 or 1B06, or Biology 1A06; Mathematics 1B03.

Level II: 30-33 units
R Arts and Science 2A06, 3C06; Biology 1A06, or Physics 1A06 or 1B06, whichever has not been completed in Level I; Chemistry 1A06; Mathematics 2A06 or 2G03 and Mathematics 2C03 or 2O03.

Level III: 29 units
R Arts and Science 3B06, and either 3A06 or 3D06; Physics 2B06, 2C05, 2H03; Computer Science 1MA3.

Level IV: 29 units
R Arts and Science 3A06 or 3D06 (whichever not completed in Level III); Physics 3H04, 3K04, 3M03, 3MM3 and 3N03; Mathematics 3C03, 3D03.

Level V: 32 units
R Arts and Science 4C06; an additional topic from Arts and Science 3C06; Physics 4B04, 4F03, 4J04; 9 units of Level III and IV Physics excluding Physics 4Q04.

HONOURS ARTS AND SCIENCE AND POLITICAL SCIENCE

Admission:
Admission requires a Level II Cumulative Area Average of at least 7.0, with a grade of at least B− in 6 units of Political Science courses.

Programme Notes:

1. Political Science 2F06 and 2O06 will be included in calculating the Graduation Average if taken after Level II.
2. The second year Arts and Science mathematics requirement may be fulfilled by Political Science 2F06.

Area Courses:
All Level II, III, IV Political Science courses.

Level I: 30 units
R Arts and Science 1A06, 1B06, 1C06, 1D06; Biology 1A06.

Levels II, III and IV: 90 units
R Arts and Science 2A06, 2D06, 3A06, 3B06, 3D06; 12 units from Arts and Science 3C06; Arts and Science 4A06 or 4C06. Political Science 4Z06 may replace Arts and Science 4A06 or 4C06.
6 units from Arts and Science 2R06, Statistics 2D03, 2M03, either Computer Science 1MA3 or 1ZA3, Mathematics 1B03;
36 units of Political Science courses of which only 12 units may be Level II and at least 6 units must be Level IV.
E 6 units, if Political Science 4Z06 is taken in place of Arts and Science 4A06 or 4C06.

HONOURS ARTS AND SCIENCE AND PSYCHOLOGY

Continuation Beyond Level I:
Students must achieve a Level I standing of at least 7.0 in the best 80% of the 30 units of Level I work including at least B in Psychology 1A06.

Programme Notes:

1. Students must meet a laboratory requirement by completing one of Psychology 3C06, 3E03, 3L03 (formerly 2U03), 3QQ3, 3S03, 3V03, 4G03, 4QQ3.
2. Arts and Science 2R06 or Psychology 2R06 will be included in the Graduation Average if taken after Level II.

Area Courses:
Psychology 2E03, 2H03, 2R06, 2T03 and all Level III and IV Psychology courses.

Level I: 30 units

R Arts and Science 1A06, 1B06, 1C06, 1D06;
Psychology 1A06.

Levels II, III and IV: 90 units

R Arts and Science 2A06, 2D06, 3A06, 3B06, 3D06; 12 units from Arts and Science 3C06;
Biology 1A06;
Arts and Science 2R06 or Psychology 2R06; Psychology 2E03, 2H03, 2T03, 4D06, 9 units Level III Psychology and 6 units Level III or 1V Psychology.

E 6 units.

HONOURS ARTS AND SCIENCE AND RELIGIOUS STUDIES

Admission:

Level I Standing of at least 7.0 in Arts and Science and at least 7.0 in Arts and Science 1A06.

Programme Notes:

1. Students must complete at least 36 units of Religious Studies in Levels II, III, and IV including: Religious Studies 3F03, 4FF3, 4GG3; 6 units from Religious Studies 2D06, 2E06, 2FF6, 2II3, 2JJ3, 2K03, 2KK3, 2LL3, 2R06, 2S06, 2YY6; and 6 units from Religious Studies 2J06, 2MM6; 9 units of Level III Religious Studies courses; 6 units of Level IV Advanced Study.
2. The computation of the Graduation Average will include all Level II, III and IV Relgious Studies courses taken.

Area Courses:

All Level II, III, and IV Religious Studies courses or approved substitutes.

Level I: 30 units

R Arts and Science 1A06, 1B06, 1C06, 1D06; Biology 1A06.

Levels II, III, and IV: 90 units

R Arts and Science 2A06, 2D06, 3A06, 3B06, 3D06, 12 units from Arts and Science 3C06; 6 units from Arts and Science 2R06, Statistics 2D03, 2M03, either Computer Science 1MA3 or 1ZA3, Math 1B03; Religious Studies 3F03, 4FF3, 4GG3, 12 units Level II Religious Studies: 6 units from 2D06, 2E06, 2FF6, 2II3, 2JJ3, 2K03, 2KK3, 2LL3, 2R06, 2S06, 2YY6; and 6 units from Religious Studies 2J06, 2MM6 and 9 units Level III Religious Studies courses, and 6 units Level IV Advanced Study.

E 6 units

HONOURS ARTS AND SCIENCE AND SOCIOLOGY

Admission:

Students must achieve a Level I standing of at least 7.0 in the best 80% of the 30 units of Level I work, and at least 7.0 in Sociology 1A06.

Area Courses:

All Level II, III, and IV Sociology courses.

Level I: 30 units

R Arts and Science 1A06, 1B06, 1C06, 1D06; Sociology 1A06.

Level II: 30 units

R Arts and Science 2A06, 2D06, Biology 1A06; Sociology 2S06, 6 units Sociology.

Level III and IV: 60 units

R Arts and Science 2R06, 3A06, 3B06, 3D06; 12 units from Arts and Science 3C06; Sociololgy 3H06; one of Sociology 3A03, 3P03, 3PP3; one of: Sociology 3O03, 3W03; 6 units Level IV Sociology; Sociology 4M03 and 4N03 to replace Arts and Science 4A06 or 4C06.

HONOURS ARTS AND SCIENCE AND SOCIAL WORK (B.ARTS SC./BSW)

Admission:

Completion of Level I, including Psychology 1A06 and Sociology 1A06, with a Level I standing of 7.0. An applicant **must** complete Level I by April of the year in which application is made. The School of Social Work will evaluate personal suitability by one, or a combination of, written statements, tests, or interviews.

Enrolment is limited. Students who intend to apply must consult the School of Social Work before applying; applications must be made prior to *March 1*.

Continuation Beyond Level I:

Students must achieve a minimum grade of C+ in each of the required Social Work core courses, and a Cumulative Area average of at least 6.0 in Social Work courses at each review; students must maintain an Arts and Science Level I standing of 7.0 and a CAA of at least 7.0 at the end of Level II and beyond in order to continue in the programme.

Programme Notes:

1. Courses in Social Work are divided into 3 groupings: required core courses, practice oriented courses, and policy oriented courses. Students should consult a counsellor in the School of Social Work concerning the specific courses related to each grouping.
2. Students are expected to assume the cost of travelling to and from field practice agencies.

Area Courses:

Group I and II Social Work Area courses taken for B.S.W. degree. (See *Programme Notes in School of Social Work.*)

Level I: 36 units

R Arts and Science 1A06, 1B06, 1C06, 1D06; Psychology 1A06; Sociology 1A06.

Level II: 36 units

R Arts and Science 2A06, 2D06; Biology 1A06; Psychology 2A03; Social Work 2B06, 2C03, 2D03, 2E03.

Level III: 36 units

R Arts and Science 3B06, 6 units from Arts and Science 2R06, Statistics 2D03, 2M03, either Computer Science 1MA3 or 1ZA3, Math 1B03; Social Work 3D06, 3DD3, and 3N03 or 3R03; 3 units from Social Work practice courses, and 6 units from Social Work policy courses.

E 3 units.

Level IV: 36 units

R Arts and Science 3C06, and 3A06 or 3D06; Social Work 4D06, 4DD6, and one of Social Work 4O03, 4X03 or 4Y03; 3 units from Social Work practice courses, and 6 units from Social Work policy courses.

Faculty of Business

G.W. Torrance/B.A.Sc., M.B.A., Ph.D., P.Eng., Dean of Business
N.C. Agarwal/B.A., M.A., Ph.D., Associate Dean of Business (Academic)
M.W.L. Chan/B.Sc., M.A., Ph.D., Associate Dean of Business (External Relations)
C. Bentzen-Bilkvist/B.A., M.A., Undergraduate Student Advisor
B. Pegg, Programme Assistant

The Faculty of Business offers three programmes, each of which spans four levels of study. The **Honours Commerce** programme, which leads to the Honours Bachelor of Commerce (Honours B.Com.) degree, provides substantial concentration in business subjects beyond the essential core of studies. The **Honours Commerce and Economics** programme, which is offered in conjunction with the Department of Economics, leads to the Honours Bachelor of Commerce and Arts (Honours B.Com. & Arts) degree. This programme combines extensive amounts of work in both Commerce and Economics. The **Commerce** programme, which leads to the Bachelor of Commerce (B.Com.) degree, contains the essential grounding in business subjects and promotes the broadening of horizons through studies in Social Sciences, Humanities and Science. These three programmes are referred to collectively as the *Commerce programmes*.

In addition, the Faculty of Business participates in a five-level programme for the Bachelor of **Engineering and Management** (B.Eng.Mgt.) degree. This programme provides a full course of study in Engineering and includes a complete core of business subjects. Details concerning the B.Eng.Mgt. programme and its academic regulations are given in the *Faculty of Engineering* section of this Calendar.

Also, the Faculty of Business participates in the Committee of Instruction and offers courses for the B.A. programme in **Labour Studies** which is described in the *Faculty of Social Sciences* section of this Calendar.

The Commerce Programmes

In Level I, a student who wishes to pursue any of the Commerce programmes establishes a foundation in computer science, economics, mathematics and psychology or sociology, and takes additional elective work. While this course of study is prescribed in Business I, a student who establishes a similar background in the Level I programme of another Faculty may also be considered for admission to Level II (Commerce II). Such a student should see the Undergraduate Student Advisor of the Faculty of Business.

A student must gain admission to Commerce II in order to proceed towards the Honours B.Com., Honours B.Com. & Arts, or B.Com. degrees. In Level II a wide range of business subjects (accounting, finance, marketing, organizational behaviour, and statistical analysis for business) are introduced and further coursework in economics is required. Elective work is taken from non-Commerce courses.

The Commerce programmes diverge at Level III. While the same core of required Commerce courses is completed in Levels III and IV, the mix of work taken over these Levels differs. In Levels III and IV of the **Honours Commerce** programme, about three-quarters of the work is in Commerce courses, with the remainder of the load coming from electives outside the Faculty. The **Honours Commerce and Economics** programme contains approximately equal amounts of work in Commerce and Economics over Levels III and IV, with few electives outside these disciplines. In Levels III and IV of the **Commerce** programme, about one-half of the course work is in each of Commerce subjects and non-Commerce electives.

PART-TIME STUDIES

The Commerce programmes may be taken through part-time studies. A part-time student is permitted to take a maximum of 18 units in any Winter Session (September to April) and a maximum of 12 units in any Summer term (May to August). It should be noted that only a few Level IV Commerce courses are offered in evenings or in summer sessions.

CONTINUING STUDENTS

Graduates of McMaster's three Commerce programmes or one of the Engineering and Management programmes may take as part-time students, Level III and IV Commerce courses (not previously taken) with permission of the Associate Dean (Academic). Such permission will be given only if normal prerequisites are satisfied and if space permits after meeting the requirements of in-course students. (see *Admission Requirements I. Continuing and Post-Degree Students)*.

With this exception, Commerce courses are not open to Continuing Students. Such students are eligible for courses designated *Business*.

SECOND UNDERGRADUATE DEGREE

A student with an undergraduate degree will not be admitted or readmitted to any of the Commerce programmes. Such a student may wish to apply for admission to the M.B.A. programme.

CREDIT TOWARDS THE M.B.A. AND PROFESSIONAL DESIGNATIONS

If appropriate academic standing has been attained in undergraduate courses, credit may be given toward the Master of Business Administration degree. Normally, this will reduce the M.B.A. programme to one additional academic year beyond the Honours B.Com., Honours B.Com. & Arts, B.Com. and B.Eng.Mgt. degrees.

Credit toward a variety of professional designations can be obtained within the Commerce programmes and the Engineering and Management programme. The professional accounting designations **C.A., C.M.A. and C.G.A.** are awarded by the Institute of Chartered Accountants of Ontario, the Society of Management Accountants of Ontario and the Certified General Accountants Association of Ontario, respectively, while the designation **C.P.M.** is awarded by the Ontario Personnel Association.

In the **Honours Commerce** programme, all the educational requirements and exemptions for the three professional accounting designations, that can be fulfilled during University study, may be accounting designations, that can be fulfilled during University study, may be obtained by selecting appropriate elective courses and taking the allowed *extra* courses (see *Extra Courses* below). For example, 39 of the 45 credits of designated course work for academic prequalification for the C.A. designation can be completed within the **Honours Commerce** programme; the remaining 6 units of credit may be taken at McMaster as *Extra*, (see *Extra Courses* below) courses while studying in the **Honours Commerce** programme or upon its completion.★ The requirements for the designation **C.P.M.** can be substantially fulfilled in the **Honours Commerce** programme.

In the **other programmes,** the possibility of obtaining credit towards professional designations is more limited. For example, 30 credits towards the **C.A.** designation may be otained in the **Commerce** programme★; further units of credit may be taken as *Extra* courses (see *Extra Courses* below). Further units of credit may also be taken after graduation (see *Continuing Students* above).

★ **NOTE**: Currently the Institute of Chartered Accountants of Ontario is reviewing the educational requirements for the C.A. designation. As a result of this review, changes to the number of credits required are likely to be forthcoming.

Information concerning credit towards these professional designations can be obtained from the Office of the Undergraduate Student Advisor of the Faculty of Business.

Academic Regulations

A student enrolled in any of the Commerce programmes, in addition to meeting the General Academic Regulations of the University, shall be subject to the following Faculty Regulations:

CUMULATIVE COMMERCE AVERAGE

The Cumulative Area Average for the Commerce programmes is termed the **Cumulative Commerce Average** (CCA) and is the weighted average of grades in **all courses**, including non-Commerce courses, **attempted** subsequent to admission to Commerce Level II or readmission to the Commerce programme, excepting those courses designated at registration as *Extra*.

CONTINUATION IN PROGRAMME

Continuation in Levels III and IV: The Cumulative Commerce Average begins with grades attained in Level II.

A student who maintains a Cumulative Commerce Average of at least 7.0, with no more than 6 units of F grades, may continue in the **Honours Commerce** programme. A student who maintains a CCA of at least 7.0, with no more than 6 units of F grades, and maintains at least a 7.0 cumulative weighted grade-point average in all Economics courses taken beyond Economics 1A06, may continue in the **Honours Commerce and Economics** programme. A student who maintains a CCA of at least 4.0, with no more than 6 units of F grades, may continue in the **Commerce** programme.

A student whose Cumulative Commerce Average is less than 4.0 or who has more than 6 units of F grades in the CCA **may not continue** in any of the Commerce programmes.

There is **no probationary status** in any of the Commerce programmes.

CHANGE OF PROGRAMME

A student may transfer between Commerce programmes prior to entering Level IV, provided that, after consultation with the Undergraduate Student Advisor of the Faculty of Business, it has been determined that the academic requirements of the new programme have been met, and an acceptable revised programme of work can be established. This revised programme of work must be approved by the Associate Dean (Academic). Approval will not be granted for a transfer from Level III Commerce into a Level IV Honours Commerce programme.

Transfer from the Honours Commerce and Economics programme into Economics programmes should be discussed with the Department of Economics.

Students in good standing in the Engineering and Management programme may transfer to a Commerce programme with the permission of the Associate Dean (Academic). The conditions for eligibility for entrance to the Commerce programmes are the same as for students registered in the Faculty of Business.

WORK LOAD

A full-time student must complete a 30-unit load in each Winter Session. Advance credit and credit earned during Summer Sessions may be used to reduce this load requirement. Such reductions will be applied as late as possible in a student's programme. In any Winter Session, a student may not register for more than 30 units (including *Extra* courses) without the approval of the Associate Dean (Academic). Such approval will not be given to a student with a Cumulative Commerce Average below 9.0.

REPEATED COURSES

Any failed course (F grade) must be repeated if it is an explicitly required course for the programme, or must be repeated or replaced if it is not explicitly required. The grades for both the failed course and its repetition or replacement, as appropriate, will be included in the calculation of a student's CCA. Voluntary repetitions of non-Commerce courses in which passing grades have been previously attained are designated as *Extra* courses. (See *Extra* Courses below)

EXTRA COURSES

Courses in addition to those which constitute the student's programme must be designated *Extra* at registration and the grades obtained in such courses affect neither eligibility for continuation in the programme nor graduation standing. In addition, the units are not included in those required for graduation. The designation *Extra* can be neither added nor removed retroactively. *Extra* courses may be taken only upon successful completion of Level III of any of the Commerce programmes. No *Extra* courses may be scheduled in a manner which would delay completion of a student's programme. Commerce courses previously taken cannot be repeated as *Extras*.

LEVEL OF REGISTRATION

A student is required to register in the lowest Level for which more than 6 units of work is incomplete. Work of the next higher Level may be undertaken only when necessary to fill a programme load.

RE-ADMISSION

A student in Level II, III or IV of a Commerce programme who becomes ineligible to continue in the Faculty may apply for re-admission to the *Commerce programme* in a subsequent calendar year.

Re-admission is not guaranteed.

Application for re-admission must be made in writing to the Associate Dean (Academic) by April 30 of the year for which re-admission is desired. This application should explain why the student would expect to succeed in the programme if re-admitted.

A student who is re-admitted after having become ineligible to continue in a Commerce programme must repeat all the courses of the Level at which he became ineligible to continue unless specific course exemptions are granted. The earliest possible session for re-admission is the session starting in September of the year following the year in which the student became ineligible to continue. The computation of a student's CCA begins anew at such re-admission.

PREREQUISITES FOR COMMERCE COURSES

Prerequisites for Commerce courses are specified in the course listing. A grade of at least D− must be attained to satisfy any course prerequisite.

COURSE CHANGES

It is the responsiblity of the student to ensure that the programme of work undertaken meets the requirements for the degree. All course changes must be made through the Office of the Undergraduate Student Advisor and will be subject to the deadline dates established by the University (see *Sessional Dates* section of this Calendar).

GRADUATION

The Graduation Average (GA) is the weighted average of all grades in courses taken for Levels III and IV of the programme, excluding Extra courses. A minimum GA of 4.0 is required for graduation from any of the Commerce programmes.

First-class standing requires at least a 9.5 GA.

Second-class standing requires at least a 7.0 GA.

Third-class standing is specified for students with a GA of less than 7.0.

FORMER COMMERCE STUDENTS

If you were previously registered in a Commerce programme and in good standing but did not attend last year, you must write to the Associate Dean (Academic) to seek readmission. The letter should explain your activities (academic and otherwise) since you were last registered.

If five years have passed since you were last registered at McMaster, please see *Application Procedures-Former McMaster Students* section of the calendar.

Graduates of McMaster's Commerce or Engineering and Management programmes should refer to the *Faculty of Business-Continuing Students* section of the calendar.

INQUIRIES RE: ACADEMIC REGULATIONS

A student seeking relief from the Faculty of Business regulations must apply in writing, with appropriate documentation attached. Guidelines for such requests may be obtained from the Office of the Undergraduate Student Advisor (Kenneth Taylor Hall, Room 118).

Programmes

The chart *Structure of Programmes* should be used in conjunction with the text description of the programmes that follow.

BUSINESS I: 30 units

R Computer Science 1BA3; Economics 1A06; Mathematics 1L03; Mathematics 1M03 or 1A06; Psychology 1A06 or Sociology 1A06.

E Electives to make a total of 30 units (students without Grade 13 Calculus must elect Mathematics 1K03).

COMMERCE

Admission:

Admission to Commerce Level II is by selection on the basis of the overall weighted average attained in the work designated for Level I.

To be considered for Commerce Level II, a Business I student normally must have attained a weighted average of at least 5.0 on the first attempt in the 30 units of Level I with no F grades. In addition, the Business I student normally must have completed the full load (30 units) in a single Winter Session (September to April).

Enrolment in Commerce Level II is limited to a maximum of 300 students.

A maximum of 50 of the 300 places in Commerce Level II may be given to students from other universities or from other Faculties within McMaster University. Academic requirements for admission of transfer students may be more demanding than those for Business I students.

Admission to any of the Commerce programmes beyond Commerce Level II is not possible.

Level II: 30 units

R Commerce 2AA3, 2BA3, 2FA3, 2MA3, 2QA3; Economics 2G03 or 2L06; Economics 2H03 or 2M06.

(A student who wishes to proceed in the **Honours Commerce** programme or the **Commerce** programme may substitute Economics 2L06 for 2G03 and Economics 2M06 for 2H03, and should do so if a substantial amount of further work in Economics is planned. A student who wishes to proceed in the **Honours Commerce and Economics** programme must take Economics 2L06 and 2M06.)

E Electives from non-Commerce courses to make a total of 30 units.

(A student who wishes to proceed in the **Honours Commerce and Economics** programme must take elective work from other than Commerce and Economics courses, and is advised to elect Mathematics 2L03 as preparation for Economics 3A03 in Level III.)

HONOURS COMMERCE (Honours B.Com.)

Requirements for continuation towards the Honours B.Com. degree are specified above in *Academic Regulations*.

Level III: 30 units

R Commerce 3AA3, 3FA3, 3MA3, 3QA3, 3QB3; Commerce 3BA3 or 3BB3; six additional units from among Commerce 3AB3, 3BA3, 3BB3, 3FB3, 3MB3.

E 6 units of electives from non-Commerce courses.

Level IV: 30 units

R Commerce 4PA3, 4QA3; 15 or 18 additional units from Groups 1 to 6 below. No more than 12 of these 15 or 18 additional units can be taken in Level IV from any one Group. (See Group listing below.)

E 6 or 9 units of electives from non-Commerce courses beyond Level I.

Group 1 (Accounting)	Commerce 3AB3, 4AA3, 4AB3, 4AC3, 4AD3, 4AE3, 4AF3.
Group 2 (Human Resources and Labour Relations)	Commerce 3BA3, 3BB3, 4BA3, 4BB3, 4BC3, 4BD3, 4BE3.
Group 3 (Finance)	Commerce 3FB3, 4FA3, 4FB3, 4FC3.
Group 4 (Marketing)	Commerce 3MB3, 4MC3, 4MD3.
Group 5 (Environment and International Business)	Commerce 4PB3, 4PC3, 4PD3, 4PE3.
Group 6 (Production and Management Science)	Commerce 4QB3, 4QC3.

HONOURS COMMERCE AND ECONOMICS (Honours B.Com. & Arts)

Requirements for continuation towards the Honours B.Com. & Arts degree are specified above in *Academic Regulations*.

Level III: 30 units

R Commerce 3AA3, 3FA3, 3MA3, 3QA3, 3QB3; Commerce 3BA3 or 3BB3; Economics 3A03, 3AA3; six additional units in Economics.

Level IV: 30 units

R Commerce 4PA3, 4QA3; six additional units in Commerce; twelve units in economics including one of Economics 2K03, 3I03, 3M03 or 3R03 if not taken previously.

E 6 units of electives from other than Commerce and Economics courses.

COMMERCE (B.Com.)

Requirements for continuation towards the B.Com. degree are specified above in *Academic Regulations*.

Level III: 30 units

R Commerce 3AA3, 3FA3, 3MA3, 3QA3, 3QB3; Commerce 3BA3 or 3BB3.

E 12 units of electives from non-Commerce courses.

Level IV: 30 units

R Commerce 4PA3, 4QA3; 9 additional units from Groups 1 to 6 above. No more than 6 of these 9 additional units can be taken from any one Group.

E 15 units of electives from non-Commerce courses beyond Level I.

*See **"Structure of Programmes"** Chart on next page.*

	STRUCTURE OF PROGRAMMES **Required** - courses are common for all students. **Electives** - as appropriate for programme and student interest.	**THE FACULTY OF BUSINESS OFFERS THREE UNDERGRADUATE PROGRAMMES EACH SPANNING FOUR LEVELS OF STUDY**		
		B. COMMERCE	HONOURS B.COMMERCE	HONOURS B.COMMERCE & ARTS (ECONOMICS)
LEVEL I 30 units*	Required - Introductory courses in computer science, economics, mathematics and sociology or psychology	21	21	21
	Electives - Chosen from courses offered in Humanities, Science and the Social Sciences	9	9	9
		30 units	30 units	30 units
LEVEL II 30 units	Required - Commerce courses in accounting, finance, marketing, organizational behaviour, statistical analysis	15	15	15
	- Intermediate level courses in Economics	6	6	12
	Electives - Non-Commerce courses offered in other Faculties	9	9	3
		30 units	30 units	30 units
LEVEL III 30 units	Required - Commerce courses in accounting, finance, marketing, managerial decision theory, information systems, and personnel or industrial relations	18	18	18 6 units of Economics required
	Electives - →	12 units of Non-Commerce electives	6 units of Commerce electives 6 units of Non-Commerce electives	6 units of Economics electives
		30 units	30 units	30 units
LEVEL IV 30 units	Required - Commerce courses in Business Policy and Production/Operations	6	6	6
	Electives - →	9 units of Commerce electives 15 units of Non-Commerce electives	15-18 units of Commerce electives 6-9 units of Non-Commerce electives	6 units of Commerce electives 12 units of Economics electives 6 units of Non-Commerce, Non-Economics electives
		30	30 units	30 units
TOTAL UNITS REQUIRED FOR GRADUATION =		120 units	120 units	120 units

* A unit represents one class hour per week per term.

Faculty of Engineering

A.C. Heidebrecht/B.Sc., M.S., Ph.D., P.Eng., Dean of Engineering
M.A. Dokainish/B.Sc., M.A.Sc., Ph.D., P.Eng., Associate Dean of Engineering (Academic Programmes)
B.L. Allen/B.Sc., Ph.D., P.Eng., Associate Dean of Engineering (External Relations)
P.E. Wood/B.A.Sc., Ph.D., Director of Engineering I
J. Zywina, Undergraduate Student Advisor

An engineer, as originally defined, meant an *ingenious person*. The engineer today is concerned with the creation of devices, systems, and structures for human use. In this role of creator and of innovator, the engineer finds resourcefulness and capacity for invention at the heart of the practice of engineering. Modern society is challenged to advance from heedless exploitation of our world to an era of exercising beneficial control of the environment, and the useful management of both the products and wastes of our industries. Engineering education at McMaster provides a host of choices which lead to this creative and fulfilling role in society.

Four-year programmes are offered leading to the Bachelor of Engineering Degree in the following fields of specialization:

Ceramic Engineering
Chemical Engineering
Civil Engineering
Computer Engineering
Electrical Engineering
Engineering Physics
Manufacturing Engineering
Materials Engineering
Mechanical Engineering
Metallurgical Engineering

A five-year programme, also leading to the Bachelor of Engineering Degree, is offered in:

Civil Engineering and Computer Systems

In addition, and in conjunction with the Faculty of Business, five-year programmes leading to the Bachelor of Engineering and Management degree are offered in:

Ceramic Engineering and Management ⋆
Chemical Engineering and Management
Civil Engineering and Management
Computer Engineering and Management
Electrical Engineering and Management
Engineering Physics and Management
Materials Engineering and Management ⋆
Mechanical Engineering and Management
Metallurgical Engineering and Management ⋆

⋆ The offering of these programmes is contingent upon approval by the Ontario Council on University Affairs.

McMaster baccalaureate degree programmes in Engineering are accredited by the Canadian Engineering Accreditation Board of the Canadian Council of Professional Engineers (CEAB), except the new programmes in Civil Engineering & Computer Systems and in Materials Engineering which will be examined at the next accreditation. Provincial Engineering Associations accept the accreditation as a major requirement for admission to the qualification Professional Engineer.

At McMaster, Engineering students take a common Level I programme comprising Mathematics, Physics, Chemistry, Engineering Design, Computation and a complementary studies elective. The specialized programmes are entered at Level II. Students interested in one of the Engineering and Management programmes must take Economics 1A06 as their elective in Level I.

Programmes offered by the Faculty of Engineering include three types of elective courses, which are governed by regulations, as follows:

Complementary Studies Electives are broadening courses which are not in subjects that are cognate with Engineering programmes (with the exception of Economics 1A06 for Engineering and Management programmes).

A total of 21 units of complementary studies electives is required in all B.Eng. programmes. Of these, 6 units must be selected from courses that are designated as being above Level I.

The Associate Dean of Engineering (Academic Programmes) must authorize each student's complementary studies elective courses from an approved list, published each spring and available from his office.

Technical Electives are Engineering or Applied Science courses in subjects relevant to the particular Engineering programme.

Commerce Electives are required in Level V of Engineering and Management programmes. With appropriate selection of these electives, students may obtain exemption from certain course requirements on subsequent admission to the MBA programme at McMaster University.

Both the appropriate Department Chairman and the Associate Dean of Engineering (Academic Programmes) must approve each student's Technical and Commerce Elective Courses.

Academic Regulations

Students enrolled in Engineering programmes, in addition to meeting the General Academic Regulations of the University, shall be subject to the following Faculty Regulations:

ENGINEERING I

A student in Engineering I whose University Average (UA) is less than 4.0 is required to withdraw from Engineering.

ADMISSION TO LEVEL II ENGINEERING PROGRAMMES

Students who have completed Engineering I and passed the McMaster Test of Writing Competence will, insofar as is possible, be given a free choice of Level II programmes. However, there may be restrictions on enrolments in certain Level II programmes, and both the University Average at the completion of Engineering I, and the number of units attempted before such completion, may be used to determine individual student eligibility for such programmes. Students who achieve a University Average of 4.0 or greater, but have not satisfactorily completed all Engineering I work *may* be admissible to a Level II programme, but may be precluded from taking Level II courses for which the missing work is prerequisite.

CUMULATIVE ENGINEERING AVERAGE

The Cumulative Area Average for Engineering programmes is termed the Cumulative Engineering Average (CEA), and is the weighted average of all courses attempted and repeated subsequent to admission to the first Engineering programme, at Level II or above, with the exception that the CEA begins anew at readmission after being ineligible to continue in a programme. Those courses required in Engineering I or designated as *Extra* are excluded from the CEA.

CONTINUATION IN PROGRAMME

A student who obtains a Cumulative Engineering Average of at least 4.0, with no F grades, may continue in an Engineering programme. A student whose Cumulative Engineering Average is at least 3.5, but less than 4.0, or is at least 4.0 and includes any F grade in the work of the most recent Reviewing period, and who has not previously been placed on probation, may, at the discretion of the Faculty and subject to the availability of space, continue on Programme Probation.

A student whose Cumulative Engineering Average is less than 4.0 and who has not been granted probation, or whose Cumulative Engineering Average is less than 3.5, is ineligible to continue in Engineering.

THE MCMASTER TEST OF WRITING COMPETENCE

Students admitted to Engineering I on or after September 1986, must have passed the McMaster Test of Writing Competence before they will be permitted to register in any programme in the Faculty of Engineering other than Engineering I. Students accepted into an Engineering programme above Level I, who were not registered at McMaster University in the Session immediately previous, must pass the Test within one year of that acceptance in order to be eligible to continue in that programme.

SEQUENCE OF COURSES

Courses must be taken in the sequence specified in the Calendar for the Programme. Students must register for all outstanding work of one Level before attempting work for a higher Level.

REPEATED COURSES

All failed courses (grade 'F') must be repeated if they are required courses for the Engineering programme or may be replaced if they are not courses explicitly required. Courses may be repeated only following failure (F) or inability to achieve prerequisite standing for a required course or approved technical elective course.

EXTRA COURSES

Courses in addition to those which constitute the degree programme in which the student is registered may be designated *Extra* at registration and the grades obtained in such courses will neither be included in the Cumulative Engineering Average nor the units in those required for graduation. *The designation Extra cannot be removed retroactively.*

LEVEL OF REGISTRATION

A student is required to register in the lowest Level for which more than six units of work is incomplete. Work of a higher Level may be undertaken only with the permission of the Associate Dean of Engineering (Academic Programmes).

WINTER SESSION WORK LOAD

The Faculty of Engineering has set a minimum Winter Session work load of 34 units for Engineering I students. The work load for other students must be approved by the appropriate Department Chairman and the Associate Dean of Engineering (Academic Programmes). In order to qualify for most scholarships, students should register in the full load of work prescribed by programme and level.

READMISSION TO ENGINEERING

A student who is ineligible to continue may apply for readmission to Engineering after not less than one year of practical work experience. Application for readmission must be made in writing to the Associate Dean of Engineering (Academic Programmes) in March of the year for which readmission is desired and should include a recommendation from the current employer. **Readmission is not guaranteed.** A student who is readmitted after being ineligible to continue at a given Level must repeat all the courses of that Level, unless specific course exemptions are granted explicitly in the letter of readmission. The computation of the Cumulative Engineering Average begins anew at such readmission.

PROGRAMME CHANGES

It is the responsibility of the student to ensure that the programme of work undertaken meets the degree requirements for that programme. All programme changes must be made through the office of the Associate Dean of Engineering (Academic Programmes) and will be subject to the deadline dates established by the University (see *Sessional Dates* section of this Calendar).

GRADUATION

A minimum Graduation Average of 4.0 is required for Graduation from all B.Eng. and B.Eng.Mgt. programmes.

Honours standing at graduation will be granted to a student whose Graduation Average (GA), based on all Level III, IV, and V courses (i.e. those labelled 3—, 4— or 5—) and not designated *Extra*, is at least 10.0. This same Graduation Average will be used to determine a Progamme Standing for all students fulfilling the graduation requirements in May of each year.

Engineering I: 34 units

R Chemistry 1E03; Engineering 1C04, 1D04; Mathematics 1H05, 1N06; Physics 1D03, 1E03.

E 6 units complementary studies elective.

Programmes for the B.Eng. and B.Eng.Mgt. Degrees

ADMISSION:

Admission to Level II Engineering programmes is by selection but, as a minimum, requires completion of **Engineering I** with a University Average of at least 4.0. In addition, admission to any B.Eng.Mgt. programme requires the completion of Economics 1A06 with a minimum grade of C, and the submission of a written application.

CERAMIC ENGINEERING (B.Eng.)

Admission:

See *Admission* described at the beginning of the programme listing.

Programme Notes:

1. Level II Ceramic Engineering is identical to Level II Metallurgical Engineering. Transfer to Level III Metallurgical Engineering can therefore be made without course deficiency.
2. Attention is drawn to Materials 4A01, which requires a report based on experience in the summer before entering Level IV.

Level II: 36 units

R Chemistry 2P06 if 2T06 has not been completed; Engineering 2M04, 2O03, 2P04; Materials 2C04, 2F03; Mathematics 2M06; 6 units approved English literature.

Level III: 37 units

R Ceramics 3A04; Chemical Engineering 2O04 or Mechanical Engineering 3O04; Chemistry 2W03; Geology 2B04; Materials 3B04, 3D06, 3E06; Mathematics 3V06.

Level IV: 36 units

R Ceramics 4L04, 4R03, 4S03; Engineering 4A03 or 4H03 or equivalent, 4B03; Materials 3P03, 4A01, 4E03, 4K04.

E 3 units approved complementary studies elective; 6 units approved Level III or IV technical elective.

CERAMIC ENGINEERING AND MANAGEMENT (B.Eng.Mgt.)

The offering of this programme is contingent upon approval by the Ontario Council on University Affairs. Further information should be obtained from the Associate Dean of Engineering (Academic Programmes).

Admission:

See *Admission* described at the beginning of the programme listing.

Programme Note:

Attention is drawn to Engineering and Management 4G01 and 5G01, the voluntary intensive courses offered in the month of May, commencing in 1989 and 1990 respectively.

Level II: 39 units

R Chemistry 2P06 if 2T06 has not been completed; Commerce 2AA3, 2BA3; Economics 2G03, 2H03; Engineering and Management 2A01; Engineering 2M04, 2O03; Mathematics 2M06; Materials 2C04, 2F03.

Level III: 38 units

R Ceramics 3A04; Commerce 2FA3, 2MA3, 3AA3; Engineering and Management 3A01; Engineering 2P04; Geology 2B04; Materials 3B04, 3D06; Mathematics 3V06.

Level IV: 38 units

R Ceramics 4R03; Chemical Engineering 2O04 or Mechanical Engineering 3O04; Chemistry 2W03; Commerce 3BA3 or 3BB3, 3FA3, 3MA3; Engineering and Management 4A01; Materials 3E06, 3P03; Statistics 3Y03; 6 units approved English literature.

Level V: 36 units

R Ceramics 4L04, 4S03; Commerce 4PA3, 4QA3; Engineering and Management 5A01, 5B03; Materials 4E03, 4K04.

E 6 units of Commerce selected from Level III and IV Commerce courses; 6 units approved technical electives, 3 units of which may be replaced by approved complementary studies elective.

CHEMICAL ENGINEERING (B.Eng.)

Admission:

See *Admission* described at the beginning of the programme listing.

For not more than 10 students, a specialty option in process control is available. To enter this option, you can apply through the Chairman. The package consists of Chemical Engineering 3P03, 4E03, Electrical Engineering 4CB3 plus possible additional enrichment through the senior year thesis or design project.

Level II: 38 units

R Chemical Engineering 2C02, 2D04, 2F04, 2G03, 2O04; Chemistry 2M05; Engineering 2R04; Mathematics 2M06; 6 units approved complementary studies electives.

Level III: 34 units

R Chemical Engineering 3A04, 3D03, 3E03, 3G03, 3K03, 3L02, 3M04, 3P03; Chemistry 2O06; Statistics 3N03.

Level IV: 35 units

R Chemical Engineering 4K03, 4L02, 4M03, 4N04, either 4W04 or 4Y04; Engineering 2M04, 4A03 or 4H03 or equivalent; two of Chemical Engineering 4B03, 4C03, 4D03, 4E03, 4T03, 4Z03, Chemistry 3I03, Electrical Engineering 4CB3, Engineering 4U03.

E 3 units complementary studies electives; 3 units approved Level III or IV technical electives.

CHEMICAL ENGINEERING AND MANAGEMENT (B.Eng.Mgt.)

Admission:

See *Admission* described at the beginning of the programme listing.

Programme Note:

Attention is drawn to Engineering and Management 4G01 and 5G01, the voluntary intensive courses offered in the month of May, commencing in 1989 and 1990 respectively.

Level II: 36 units

R Chemical Engineering 2C02, 2D04, 2F04, 2O04; either Chemical Engineering 2G03 or Commerce 3QB3; Commerce 2AA3, 2BA3; Economics 2G03, 2H03; Engineering and Management 2A01; Mathematics 2M06.

Level III: 37 units

R Chemical Engineering 3A04, 3D03, 3E03, 3M04; Chemistry 2O06; Commerce 2FA3, 3AA3; Engineering 2R04; Engineering and Management 3A01; 6 units approved complementary studies electives.

Level IV: 37 units

R Chemical Engineering 3G03, 3K03, 3L02, 3P03, 4M03; Commerce 2MA3, 3FA3, 3BA3 or 3BB3, 3MA3, 4QA3; Engineering 2M04; Engineering and Management 4A01; Statistics 3Y03.

Level V: 35 units

R Chemical Engineering 4K03, 4L02, 4N04, and 4W04 or 4Y04; Commerce 4PA3; Engineering and Management 5A01, 5B03; two of Chemical Engineering 4B03, 4C03, 4D03, 4E03, 4T03, 4Z03, Chemistry 3I03, Electrical Engineering 4CB3, Engineering 4U03.

E 6 units of Commerce selected from Level III or IV Commerce courses; 3 units approved technical electives.

CIVIL ENGINEERING (B.Eng.)

Admission:

See *Admission* described at the beginning of the programme listing.

Programme Notes:

1. Level IV Civil Engineering courses must be selected in accordance with regulations which require a specified minimum content of engineering design and synthesis. Before the end of Level III, students must complete a Civil Engineering electives form, and ensure that it has been approved by the Department before completing a Level IV Registration Form.
2. Students entering the programme before **September 1989** are required to take Civil Engineering 3A03. Those entering the programme **on or after** this date are required to take Civil Engineering 3D03 in Level III.

Level II: 39 units

R Civil Engineering 2A02, 2B02, 2C04, 2E02, 2F03, 2O03; Engineering 2C03, 2P04, 2Q04; Mathematics 2M06; 6 units approved complementary studies electives.

Level III: 36 units

R Civil Engineering 3A03, 3B03, 3C04, 3G04, 3J04, 3K03, 3M04, 3Q04; Engineering 3P03; Mathematics 3J04.

Level IV: 34-36 units

R Engineering 4B03; one of Engineering 4A03, 4H03 or Civil Engineering 4C03 or equivalent; 25 to 27 units chosen from Level IV Civil Engineering courses.

E 3 units complementary studies elective.

CIVIL ENGINEERING AND COMPUTER SYSTEMS (B.Eng.) (entered *from* September 1987)

Admission:

See *Admission* described at the beginning of the programme listing.

Programme Notes:

1. Level IV Civil Engineering courses must be selected in accordance with regulations which require a specified minimum content of engineering design and synthesis. Before the end of Level III, students must complete a Civil Engineering electives form, and ensure that it has been approved by the Department before completing a Level IV Registration Form.
2. Students entering the programme before **September 1988** are required to take Civil Engineering 3A03. Those entering **on or after** this date are required to take Civil Engineering 3D03 during Level IV.

Level II: 36 units

R Computer Science 1MB3, 2MF3; Civil Engineering 2A02, 2B02, 2C04, 2O03, 3K03; Engineering 2P04; 6 units approved complementary studies electives; Mathematics 2M06.

Level III: 35 units

R Computer Science 2MC3, 2MD3; Civil Engineering 2E02, 2F03, 3M04, 3Q04; Engineering 2C03, 2Q04, 3P03; Mathematics 3Q03.

E 3 units complementary studies elective.

Level IV: 37 units

R Computer Science 3CA3, 3EA3, 3MG3, 3SC3; Civil Engineering 3A03, 3B03, 3C04, 3G04, 3J04; one of Engineering 4A03, 4H03 or Civil Engineering 4C03 or equivalent; Mathematics 3J04.

Level V: 36-38 units

R Computer Science 4G06, 4EB3; 21 to 23 units Civil Engineering Level IV courses; Engineering 4B03, 4C03.

CIVIL ENGINEERING AND MANAGEMENT (B.Eng.Mgt.)

Admission:

See *Admission* described at the beginning of the programme listing.

Programme Notes:

1. Level IV Civil Engineering courses must be selected in accordance with regulations which require a specified minimum content of engineering design and synthesis. Before the end of Level III, students must complete a Civil Engineering electives form, and ensure that it has been approved by the Department before completing a Level IV Registration Form.
2. Students are urged to register for *audit* in Engineering and Management 2A01 or 3A01.

3. Attention is drawn to Engineering and Management 4G01 and 5G01, the voluntary intensive courses offered in the month of May, commencing in 1989 and 1990 respectively.
4. Students entering the programme before **September 1988** are required to take Civil Engineering 3A03. Those entering the programme **on or before** this date are required to take Civil Engineering 3D03 in Level IV.

Level II: 39 units

R Civil Engineering 2A02, 2B02, 2C04, 2O03; Commerce 2AA3, 2BA3; Economics 2G03, 2H03; Engineering 2P04; Mathematics 2M06; 6 units approved complementary studies electives.

Level III: 39 units

R Civil Engineering 2E02, 2F03, 3K03, 3M04, 3Q04; Commerce 2FA3, 2MA3, 3AA3; Engineering 2C03, 2Q04, 3P03; Mathematics 3J04.

Level IV: 37-38 units

R Civil Engineering 3A03, 3B03, 3C04, 3G04, 3J04; 3 or 4 units Level IV Civil Engineering courses; Commerce 3FA3, 3BA3 or 3BB3, 3MA3, 4QA3; Engineering and Management 4A01; Statistics 3Y03.

Level V: 37-38 units

R 20 to 21 units of Level IV Civil Engineering; Commerce 4PA3; Engineering and Management 5A01, 5B03.

E 6 units Commerce electives selected from Level III and IV Commerce courses; complementary studies or approved technical electives to make a total of 37 units.

COMPUTER ENGINEERING (B.Eng.)

Admission:

See *Admission* described at the beginning of the programme listing.

Programme Note:

This programme is in transition to a revised curriculum. Details on the complete revision may be obtained from the Department of Electrical and Computer Engineering.

Level II: 36 units

R Computer Engineering 2HA3, 2KA3, 2YA4; Electrical Engineering 2BA3, 2DA3, 2FA3; Engineering 2O03; Mathematics 2P04, 2Q04; 6 units approved complementary studies electives.

Level III: 36 units

R Computer Engineering 3HB3, 3KB3, 3VA3, 3WA3; Electrical Engineering 3AA3, 3BB3, 3CA3, 3DB3, 3FB3, 3FC3; Mathematics 3K03; Statistics 3X03.

Level IV: 34 units

R Computer Engineering 4MA3, 4HC3, 4HD3, 4JA4; Electrical Engineering 3CA3, 4QA3; Engineering 4B03, 4A03 or 4H03 or equivalent.

E 9 units from Computer Science 4CB3, 4W03, and Level III or IV Electrical Engineering or Engineering Physics or Level IV Computer Engineering.

COMPUTER ENGINEERING AND MANAGEMENT (B.Eng.Mgt.)

Admission:

See *Admission* described at the beginning of the programme listing.

Programme Notes:

1. Attention is drawn to Engineering and Management 4G01 and 5G01, the voluntary intensive courses offered in the month of May, commencing in 1989 and 1990 respectively.
2. This programme is in transition to a revised curriculum. Details on the complete revision may be obtained from the Department of Electrical and Computer Engineering.

Level II: 37 units

R Commerce 2AA3, 2BA3; Computer Engineering 2HA3, 2KA3, 2YA4; Electrical Engineering 2BA3, 2DA3, 2FA3; Engineering 2O03; Engineering and Management 2A01; Mathematics 2P04, 2Q04.

Level III: 37 units

R Commerce 2FA3, 3AA3; Computer Engineering 3HB3, 3VA3, 3WA3; Economics 2G03, 2H03; Electrical Engineering 3BB3; Engineering 4A03 or 4H03 or equivalent; Engineering and Management 3A01; Mathematics 3K03; Statistics 3X03; 3 units approved English literature.

Level IV: 37 units (1989-90 only)

R Commerce 2MA3, 3FA3, and 3BA3 or 3BB3; Computer Engineering 3KB3, 4HC3; Electrical Engineering 3AA3, 3CA3, 3DB3, 3FB3, 3FC3; Engineering and Management 4A01; Statistics 3X03, 3Y03.

Level V: 35 units (1989-90 only)

R Commerce 3MA3, 4PA3, 4QA3; Computer Engineering 4MA3, 4HC3, 4HD3, 4JA4; Engineering and Management 5A01, 5B03.

E 6 units Commerce electives selected from Level III and IV Commerce courses; 3 units approved electives from Computer Science 4CB3, 4W03 and Level III or IV Electrical Engineering or Engineering Physics or Level IV Computer Engineering.

ELECTRICAL ENGINEERING (B.Eng.)

Admission:

See *Admission* described at the beginning of the programme listing.

Level II: 35 units

R Computer Engineering 2HA3, 2KA3; Electrical Engineering 2BA3, 2DA3, 2FA3; Engineering 2O03, 2S03; Mathematics 2P04, 2Q04.

E 6 units approved complementary studies elective.

Level III: 36 units

R Computer Engineering 3HB3, 3KB3; Electrical Engineering 3AA3, 3BB3, 3CA3, 3DB3, 3FB3, 3FC3, 3NA3, 3SA3; Mathematics 3K03; Statistics 3X03.

Level IV: 34 units

R Electrical Engineering 4JA4, 4QA3; Engineering 4B03, 4A03 or 4H03 or equivalent; 12 units of Electrical Engineering Level IV courses.

E 9 units Level III or IV approved technical electives.

ELECTRICAL ENGINEERING AND MANAGEMENT (B.Eng.Mgt.)

Admission:

See *Admission* described at the beginning of the programme listing.

Programme Note:

1. Attention is drawn to Engineering and Management 4G01 and 5G01, the voluntary intensive courses offered in the month of May, commencing in 1989 and 1990 respectively.

Level II: 36 units

R Commerce 2AA3, 2BA3; Computer Engineering 2HA3, 2KA3; Economics 2G03, 2H03; Electrical Engineering 2BA3, 2DA3, 2FA3; Engineering and Management 2A01; Mathematics 2P04, 2Q04.

Level III: 37 units

R Commerce 2FA3, 3AA3; Computer Engineering 3HB3; Electrical Engineering 3CA3, 3DB3, 3FB3, 3FC3; Engineering 2O03, 4A03 or 4H03 or equivalent; Engineering and Management 3A01; Mathematics 3K03; Statistics 3X03; 3 units approved English literature.

Level IV: 34 units

R Commerce 2MA3, 3FA3, 3BA3 or 3BB3; Computer Engineering 3KB3; Electrical Engineering 3AA3, 3BB3, 3NA3, 3SA3; Engineering 2S03; Engineering and Management 4A01; Statistics 3Y03.

E 3 units approved Level III or IV technical electives.

Level V: 35 units

R Commerce 3MA3, 4PA3, 4QA3; Electrical Engineering 4JA4; Engineering and Management 5A01, 5B03.

E 6 units Commerce electives selected from Level III and IV Commerce courses; 12 units Level III or IV approved technical electives, of which at least 9 units must be selected from Electrical Engineering Level IV courses.

ENGINEERING PHYSICS (B.Eng.)

Admission:

See *Admission* described at the beginning of the programme listing.

Programme Note:

The following areas and courses are suggested as technical electives for Level IV:

Computer Systems Engineering Physics 4W03, Physics 4D06.
Lasers and Electro-Optics Engineering Physics 4G03, 4K03, 4S04.
Nuclear Engineering Engineering Physics 4D03, 4L03, 4N03.
Solid State Electronics Engineering Physics 4E03, 4F03, 4Z03.

Level II: 37 units

R Engineering 2O03, 2P04, 2W04; Engineering Physics 2A03, 2E04; Mathematics 2P04, 2Q04; Physics 2C05; 6 units approved English literature.

Level III: 36 units

R Engineering Physics 3D03, 3E03, 3F03, 3O03; Mathematics 3C03, 3D03, 3Q03; Physics 3B06, 3M03.

E Complementary studies elective (which may be deferred to Level IV), or approved technical electives to make a total of 36 units.

Level IV: 36-38 units

R Engineering 4A03 or 4H03 or equivalent, 4B03; Engineering Physics 4A04, 4C02, 4U04; Physics 4B04; at least 10 units selected from Engineering Physics 4D03, 4E03, 4F03, 4G03, 4N03, 4S04, 4W03; Physics 4D06.

E 3 units complementary studies elective (if not completed in Level III); approved Level III or IV technical electives to make a total of 36 to 38 units.

ENGINEERING PHYSICS AND MANAGEMENT (B.Eng.Mgt.)

Admission:

See *Admission* described at the beginning of the programme listing.

Programme Note:

Attention is drawn to Engineering and Management 4G01 and 5G01, the voluntary intensive courses offered in the month of May, commencing in 1989 and 1990 respectively.

Level II: 39 units

R Commerce 2AA3, 2BA3; Economics 2G03, 2H03; Engineering 2O03, 2P04, 2W04; Engineering and Management 2A01; Engineering Physics 2A03, 2E04; Mathematics 2P04, 2Q04.

Level III: 39 units

R Commerce 2FA3, 3AA3, 2MA3; Engineering and Management 3A01; Engineering Physics 3E03, 3F03; Mathematics 3C03, 3D03; Physics 2C05, 3B06; 6 units approved English literature.

Level IV: 34 units

R Commerce 3FA3, 4QA3, and 3BA3 or 3BB3; Engineering and Management 4A01; Engineering Physics 3D03, 3O03, 4C02, 4U04; Mathematics 3Q03; Physics 3M03, 3MM3; Statistics 3Y03.

Level V: 39 units

R Commerce 3MA3, 4PA3; Engineering and Management 5A01, 5B03; Physics 4B04; at least 10 units selected from Engineering Physics 4D03, 4E03, 4F03, 4G03, 4N03, 4S04, 4W03, Physics 4D06.

E 6 units Commerce electives selected from Level III and IV Commerce courses; approved technical electives to make a total of 39 units.

MANUFACTURING ENGINEERING (B.Eng.)

Admission:

See *Admission* described at the beginning of the programme listing.

Level II: 37 units

R Engineering 2M04, 2O03, 2P04, 2Q04, 2W04; Manufacturing Engineering 2C03; Mathematics 2M06; Mechanical Engineering 2A03; 6 units approved English literature.

Level III: 38 units

R Engineering 3M03, 3N03, 3R03; Manufacturing Engineering 3M03; Mathematics 3V06; Mechanical Engineering 3A03, 3C03, 3E04, 3O04, 3R03, 4X03.

Level IV: 39 units

R Engineering 4A03 or 4H03 or equivalent, 4B03, 4C03, 4J03; Manufacturing Engineering 4A03, 4M04, 4P02; Mechanical Engineering 4C03, 4D03, 4G03, 4Q03, 4R03.

E 3 units complementary studies elective.

MATERIALS ENGINEERING (B.Eng.)

Admission:

See *Admission* described at the beginning of the programme listings.

Programme Notes:

1. This programme is designed to permit choices of electives in Level IV which will allow study in depth of various types of modern engineering materials (e.g. electronic materials, amorphous solids, high performance alloys and ceramics.)
2. Transfer to Level III Ceramic Engineering or Metallurgical Engineering can be made without course deficiency.
3. Attention is drawn to Materials 4A01, which requires a report based on experience in the summer before entering Level IV.

Level II: 38 units

R Chemistry 2P06 if 2T06 has not been completed; Engineering 2M04, 2O03, 2P04; 6 units approved English literature; Materials 2C04, 2F03; Mathematics 2P04, 2Q04.

Level III: 34 units

R Chemistry 2W03; Engineering 3Q03; Materials 3B04, 3D06, 3E06; Mathematics 3C03 and 3D03, or 3V06; Chemistry 3U03 and 3 units approved technical elective, or Physics 3M03, 3MM3.

Level IV: 36 units

R Engineering 4A03 or 4H03 or equivalent, 4B03; Materials 3P03, 4A01, 4E03, 4K04, 4L04.

E 3 units approved complementary studies electives; 12 units approved Level III or IV technical electives.

MATERIALS ENGINEERING AND MANAGEMENT (B.Eng.Mgt.)

The offering of this programme is contingent upon approval by the Ontario Council on University Affairs. Further information should be obtained from the Associate Dean of Engineering (Academic Programmes).

Admission:

See *Admission* described at the beginning of the programme listing.

Programme Note:

Attention is drawn to Engineering and Management 4G01 and 5G01, the voluntary intensive courses offered in the month of May, commencing in 1989 and 1990 respectively.

Level II: 37 units

R Chemistry 2P06 if 2T06 has not been completed; Commerce 2AA3, 2BA3; Economics 2G03, 2H03; Engineering and Management 2A01; Engineering 2O03; Mathematics 2P04, 2Q04; Materials 2C04, 2F03.

Level III: 37 units

R Commerce 2FA3, 2MA3; Engineering and Management 3A01; Engineering 2M04, 2P04; Materials 3B04, 3D06; Mathematics 3C03 and 3D03, or 3V06; 6 units of approved English literature.

Level IV: 37 units

R Chemistry 2W03; Chemistry 3U03 or Physics 3M03, 3MM3; Commerce 3AA3, 3BA3 or 3BB3, 3FA3, 3MA3; Engineering 3Q03; Engineering and Management 4A01; Materials 3E06, 3P03; Statistics 3Y03.

E Approved Level III or IV technical elective, if required, to make a total of 37 units.

Level V: 36 units

R Commerce 4PA3, 4QA3; Engineering and Management 5A01, 5B03; Materials 4E03, 4K04, 4L04.

E 6 units of Commerce selected from Level III and IV Commerce courses; 9 units approved technical elective, 3 units of which may be replaced by approved complementary studies elective.

MECHANICAL ENGINEERING (B.Eng.)

Admission:
See *Admission* described at the beginning of the programme listing.

Level II: 37 units

R Engineering 2M04, 2P04, 2Q04, 2W04; Mathematics 2M06; Mechanical Engineering 2A03, 2B03, 2C03; 6 units approved English literature.

Level III: 37 units

R Engineering 2O03, 3M03, 3N03; Mathematics 3V06; Mechanical Engineering 3A03, 3C03, 3D03, 3E04, 3M02, 3O04, 3R03.

Level IV: 36 units

R Mechanical Engineering 4G03, 4M04, 4P02, 4Q03, 4R03, 4S03; Engineering 3R03, 4A03 or 4H03 or equivalent, 4B03.

E 3 units complementary studies elective; two of the following courses: Chemical Engineering 4T03, Civil Engineering 3K03, Electrical Engineering 3S03, Engineering 3P03, 3Q03, 3R03, 4J03, 4X03, Engineering Physics 4D03, 3X03, Mechanical Engineering 4A03, 4C03, 4D03, 4F03, 4L03, 4T03, 4U03, 4V03, 4W03, 4X03, 4Y03, 4Z03. Manufacturing Engineering 4A03 may be substituted, with the permission of the Department.

Electives must be chosen so that no more than 21 units are taken in any one term.

MECHANICAL ENGINEERING AND MANAGEMENT (B.Eng.Mgt.)

Admission:
See *Admission* described at the beginning of the programme listing.

Programme Note:
Attention is drawn to Engineering and Management 4G01 and 5G01, the voluntary intensive courses offered in the month of May, commencing in 1989 and 1990 respectively.

Level II: 39 units

R Commerce 2AA3, 2BA3; Economics 2G03, 2H03; Engineering 2M04; 2P04, 2W04; Mathematics 2M06; Mechanical Engineering 2A03; 6 units approved English literature.

Level III: 37 units

R Commerce 2FA3, 3AA3; Engineering 2O03, 2Q04, 3M03; Mathematics 3V06; Mechanical Engineering 2C03, 3D03, 3M02, 3O04, 3R03.

Level IV: 37-38 units

R Commerce 2MA3, 3FA3, and 3BA3 or 3BB3; Engineering and Management 4A01; Mechanical Engineering 3A03, 3C03, 3E04, 4C03, 4P02, 4R03, 4S03; Statistics 3Y03.

E 3 or 4 units Level III or IV approved technical electives.

Level V: 38 units

R Commerce 3MA3, 4PA3; Engineering and Management 5A01, 5B03; Mechanical Engineering 4G03, 4M04, 4Q03.

E 6 units Commerce electives selected from Level III and IV Commerce courses; 12 units approved Level III or IV technical electives, which must include at least 9 units of Mechanical Engineering.

METALLURGICAL ENGINEERING (B.Eng.)

Admission:
See *Admission* described at the beginning of the programme listing.

Programme Notes:

1. Level II Metallurgical Engineering is identical to Level II Ceramic Engineering.Transfer to Level III Ceramic Engineering can therefore be made without course deficiency.
2. Attention is drawn to Materials 4A01, which requires a report based on experience in the summer before entering Level IV.

Level II: 36 units

R Chemistry 2P06 if 2T06 has not been completed; Engineering 2M04, 2O03, 2P04; Materials 2C04, 2F03; Mathematics 2M06; 6 units approved English literature.

Level III: 35 units

R Chemical Engineering 2O04 or Mechanical Engineering 3O04; Chemistry 2W03; Materials 3B04, 3D06, 3E06, 3P03; Mathematics 3V06; Metallurgy 3C03.

Level IV: 37 units

R Engineering 3M03 or 3N03, 4A03 or 4H03 or equivalent, 4B03; Materials 4A01, 4E03, 4K04; Metallurgy 4C04, 4L04.

E 3 units complementary studies elective; 9 units Level III or IV approved technical electives.

METALLURGICAL ENGINEERING AND MANAGEMENT (B.Eng.Mgt.)

The offering of this programme is contingent upon approval by the Ontario Council on University Affairs. Further information should be obtained from the Associate Dean of Engineering (Academic Programmes).

Admission:
See *Admission* described at the beginning of the programme listing.

Programme Note:
Attention is drawn to Engineering and Management 4G01 and 5G01, the voluntary intensive courses offered in the month of May, commencing in 1989 and 1990 respectively.

Level II: 39 units

R Chemistry 2P06 if 2T06 has not been completed; Commerce 2AA3, 2BA3; Economics 2G03, 2H03; Engineering and Management 2A01; Engineering 2M04, 2O03; Mathematics 2M06; Materials 2C04, 2F03.

Level III: 36 units

R Commerce 2FA3, 2MA3; Engineering and Management 3A01; Engineering 2P04, 3M03 or 3N03; Materials 3B04, 3D06; Mathematics 3V06; 6 units approved English literature.

Level IV: 35 units

R Chemical Engineering 2O04 or Mechanical Engineering 3O04; Chemistry 2W03; Commerce 3AA3, 3BA3 or 3BB3, 3FA3, 3MA3; Engineering and Management 4A01; Materials 3E06, 3P03; Metallurgy 3C03; Statistics 3Y03.

Level V: 37 units

R Commerce 4PA3, 4QA3; Engineering and Management 5A01, 5B03; Material 4E03, 4K04; Metallurgy 4C04, 4L04.

E 6 units of Commerce selected from Level III and IV Commerce courses; 6 units approved technical electives, 3 units of which may be replaced by approved complementary studies elective.

Faculty of Health Sciences

D. R. McCalla, B.Sc., M.Sc., Ph.D., F.C.I.C./*Vice-President (Health Sciences)*
S. M. MacLeod, B.Sc., M.D., Ph.D., F.R.C.P.(C)/*Dean (Health Sciences)*
V. R. Neufeld, M.D., F.R.C.P.(C)/*Associate Dean (Education)*
S. E. French, B.N., M.S., Ph.D./*Associate Dean (Nursing)*
G. H. Flight, M.D., F.R.C.S.(C)/*Associate Dean (Health Services)*
B. Underdown, Ph.D./*Associate Dean (Research Services)*

For **information** concerning Health Sciences programmes and admission requirements, **contact**

Laurel Stuart, *Assistant Registrar,*
Health Science Complex, Room 1B7,
Telephone (416) 525-9140, ext. 2114

The concept of Health Sciences Education is based on the view that health is a broad subject encompassing not only the problems of ill-health but also the impact of biology, environment and the way of life on health. Each of the health professionals has specific educational requirements, but by training together in shared facilities there exists an opportunity to establish effective interprofessional working relationships.

The programmes in the Faculty attempt to meet these goals through a variety of teaching/learning approaches. Emphasis is placed on problem-based, small-group learning experiences. Other approaches to learning, including interdisciplinary educational experiences, are used where appropriate.

In July 1974, the School of Nursing and the School of Medicine were brought together to form the Faculty of Health Sciences. The Faculty offers the following undergraduate degree programmes: Doctor of Medicine, Bachelor of Science in Nursing, Bachelor of Health Science (Occupational Therapy or Physiotherapy).

In addition to its undergraduate programmes the Faculty of Health Sciences also has the responsibility for the Postgraduate (Internship and Residency) Education programmes, and through the School of Graduate Studies, offers M.Sc. and Ph.D. programmes in: Growth and Development, Blood and Cardiovascular systems, Neuroscience, an M.Sc. programme in Design Measurement and Evaluation, and an interprofessional M.H.Sc. programme for experienced health professionals who wish advanced preparation as clinicians, educators, and programme developers.

Interprofessional programmes, postprofessional in nature and leading to an academic diploma are offered through the Continuing Health Sciences Education programme. These include: Behavioural Sciences, Occupational Health and Safety.

The Faculty of Health Sciences collaborates with the Division of Health Sciences at Mohawk College in educational programmes for other health professions based at the College.

Research programmes encompassing the broad spectrum of health have been established including basic and applied research and various aspects of health care delivery. The graduate programmes in medical science are related to the various areas of health research.

The Health Sciences Centre at McMaster provides educational and research facilities for medicine, nursing and other health professions. It includes a teaching hospital (The McMaster University Medical Centre, a division of the Chedoke-McMaster Hospitals) with extensive ambulatory clinics for primary and specialized aspects of patient care. The building has been designed to bring into close proximity the programmes for the various health professions and to integrate the facilities for education, research and patient care in the Faculty of Health Sciences.

In addition to the Health Sciences Centre, education, research and clinical programmes are based at the Hamilton General Hospital, the Henderson General Hospital, the Hamilton Psychiatric Hospital, St. Joseph's Hospital and the Chedoke division of the Chedoke-McMaster Hospitals. Extensive use is made of community hospitals. A satellite programme has been developed with institutions in Northwestern Ontario.

In accordance with the plan to co-ordinate the development of specialized health services among the Hamilton and District hospitals, the Postgraduate Education programmes in medicine have been developed on a regional basis.

Admission and Registration

Application to any programme in the Faculty of Health Sciences **implies acceptance** on the part of the applicant of the admission policies and procedures, and the methods by which applicants are chosen for the Health Sciences programmes.

Registration in any programme in the Faculty of Health Sciences **implies acceptance** on the part of the student of the objectives of that programme and the methods by which progress toward the achievement of those objectives is evaluated.

The following describes the regulations governing admission and registration in the Health Sciences programmes, and should be considered in conjunction with specific admission requirements described on the following pages for the School of Medicine (M.D.), the School of Nursing (B.Sc.N.) and the Occupational Therapy and Physiotherapy programme (B.H.Sc.).

The following application deadlines are strictly adhered to. Deadline dates are for consideration of admission to a programme in the following September.

Programme	**Deadline**
Medicine (M.D.)	**November 1**
Nursing (B.Sc.N.)	
Applicants directly from Ontario Secondary Schools	**May 1**
Diploma Registered Nurses	**February 15**
Applicants with Other Qualifications	**February 15**
Occupational Therapy/Physiotherapy (B.H.Sc.)	**April 1**

The University reserves the right to change the admission requirements at any time without notice.

As **places** in the degree programmes of the Faculty of Health Sciences **are limited**, admission is by selection of applicants, and possession of published minimum requirements does not guarantee admission. The University, therefore, reserves the right to grant admission to a limited number of students, and to refuse re-admission to any student whose academic performance or general conduct has been unsatisfactory, or who has withdrawn from the programme for a period in excess of one academic year.

An evaluation of *Unsatisfactory* in the School of Medicine, signifies that the student has failed to meet these objectives and the University may, at its option, because of the *Unsatisfactory* evaluation, require the student to withdraw from the School at any time.

The University reserves the right to require the withdrawal of a student should his or her conduct so warrant.

Falsification of Admission Information

An applicant supplying documentation or evidence which, at the time, or subsequently, is found to be falsified will be withdrawn from consideration. Any student admitted to the programme having submitted false evidence will be asked to withdraw.

Health Regulations for Admission

Before registration, students must file with the University evidence of a recent health examination and chest X-ray. More detailed medical information will be required upon acceptance into the programme.

Clinical Course Requirements

Where, in the opinion of the faculty, the performance of the student in clinical practice may jeopardize or endanger the welfare of the patient or the patient's family, the student may be removed from clinical experience any time during the academic year, until continuation in the course is reviewed.

Information and Counselling

A member of faculty is selected for each student in the September of entry to a degree programme and provides each student with advice on evaluations, electives and other educational needs throughout the programme. In the M.D. programme, the advisor is also responsible for the collation of all evaluations and completion of the final transcript. Changes in advisors are entertained as each student becomes acquainted with faculty well enough to choose his or her own advisor.

Students who have difficulty assessing their academic backgrounds in relation to the admission requirements should write to the Assistant Registrar (Health Sciences) for a ruling about their individual application.

Transportation

Students are responsible for expenses involved in transporting themselves to community agencies, making home visits, or in connection with clinical study.

The School of Medicine

The School of Medicine, established in 1965, offers major programmes in undergraduate, postgraduate and graduate medical education. The clinical programmes use not only the teaching hospital and extensive ambulatory care and research facilities at the McMaster University Medical Centre division of the Chedoke-McMaster Hospitals, but also the clinical teaching units at each of the major Hamilton hospitals and community health care centres.

The undergraduate medical programme for the M.D. degree was initiated in 1969, graduating its first students in May of 1972. At present, 100 students are admitted to the programme each year. The academic programme operates on an eleven months-a-year basis and students qualify for the M.D. degree at the end of the third academic year. The curriculum has been designed to involve medical students with a broad range of human health problems throughout their education and to prepare them for effective working relationships with patients, colleagues, and society.

Postgraduate training programmes have been established in: Anesthesia, Community Medicine, Emergency Medicine, Family Medicine, Internal Medicine, Laboratory Medicine, Obstetrics and Gynecology, Pediatrics, Psychiatry, Radiology, and Surgery.

More details on these postgraduate programmes are available from the Assistant Registrar (Health Sciences).

A Northern Ontario medical programme has been developed in co-operation with the Thunder Bay Medical Society and physicians in towns in Northwestern Ontario. Clinical training opportunities exist in community hospitals adjacent to Hamilton. Excellent clinical experience in these settings is part of both the undergraduate and postgraduate medical programmes.

Graduate programmes leading to the M.Sc. and Ph.D. degrees are offered in Biochemistry and in Medical Sciences. Graduate studies are based on the health research programmes in the school, with special emphasis on: Blood and Cardiovascular Disorders, Growth and Development, Neurosciences and Design, Measurement and Evaluation. An M.H.Sc. (Health Care Practice) programme is interprofessional in nature and is for experienced health professionals who wish advanced preparation as clinicians.

THE MEDICAL PROGRAMME

The three-year programme in Medicine uses an approach to learning that should apply throughout the physician's career. The components have been organized in a relevant and logical manner with early exposure to patients. Flexibility is ensured to allow for the variety of student backgrounds and career goals.

General Objectives

The aim of the undergraduate medical programme is to provide students with a general professional education as physicians. The programme enables students to build on previous education and experience, using available learning resources and opportunities. The competencies achieved by graduates will qualify them to proceed to further postgraduate training. While most graduates will be involved directly with the care of individual patients, it is expected that some will choose careers concerned with the health of populations and the development of new knowledge.

The **overriding objective** to be achieved is the demonstrated ability to identify, analyze and manage clinical problems in order to provide effective, efficient and humane patient care.

Enabling objectives consisting of knowledge, skills and personal qualities to be achieved are the following.

Knowledge: To acquire and put into practice concepts and information required to understand and manage health care problems. The study of human structure, function and behaviour will be guided by an analysis of the determinants of health and illness. A spectrum of factors will be considered in both the external and internal environments of individuals, when deciding on preventive, therapeutic, rehabilitative and supportive management.

Skills: To acquire and use the following skills:

1. Critical Appraisal Skills: The application of certain rules of evidence to clinical, investigational and published data, in order to determine their validity and applicability.
2. Clinical Skills: The ability to acquire, interpret, synthesize and record clinical information in managing the health problems of patients, considering their physical, social and emotional function. Included is the use of the clinical reasoning process.
3. Self-Directed Learning Skills: The ability to identify areas of deficiency in one's own performance, find appropriate educational resources, evaluate personal learning progress, and use new knowledge and skills in the care of patients.

Personal Qualities: To recognize, develop and maintain the personal qualities required for a career as a health professional. Acquiring the authority to intervene in the lives of patients carries with it the obligation to act responsibly:

1. toward oneself: to recognize and acknowledge personal assets, emotional reactions, and limitations in one's own knowledge, skills and attitudes, and to build on one's assets and to overcome areas of limitation;
2. toward patients and their families: to be able, under appropriate supervision, to take responsibility for the assessment and care of patients and their families;
3. toward colleagues: to contribute to productive communication and co-operation among colleagues engaged in learning, research, or health care;
4. toward the community: to contribute to the maintenance and improvement of the health of the general population.

Learning Methods

To achieve the objectives of the undergraduate medical programme, students are introduced to patients with health problems within the first level of the curriculum. In this way, students understand the relevance of what they are learning, maintain a high degree of motivation and begin to understand the importance of responsible professional attitudes.

The students are presented with a series of major biomedical problems requiring for their solution the understanding of underlying physical and biological and behavioural principles, the appropriate collection of data and the critical appraisal of evidence. In each problem area, the student may select the most appropriate problems to ensure the understanding and application of fundamental concepts. This flexibility provides an opportunity for early consideration of individual interests and goals. The faculty function as learning resource personnel or guides to learning in the particular parts of the programme. Learning by a process of inquiry is stressed. Small group learning resources are utilized in the fashion most appropriate to achieve the programme's goals.

The class is divided into small groups, each with a tutor. In the tutorial session students present and discuss what they have learned and tutors assist in identifying their strengths and weaknesses and in proposing ways to overcome the latter.

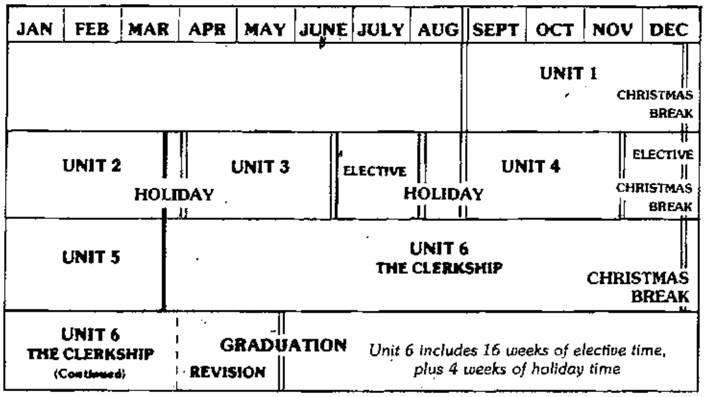
Students admitted to the undergraduate medical programme have the responsibility and privilege of taking an active role in the planning and evaluation of the education programme. Through representation on many policy-making and implementation committees, students can influence decisions regarding philosophy, faculty recruitment, and curriculum design. It is expected that all students will participate in the continuing reappraisal and improvement of the programme. Such participation is a hallmark of the School.

Student Evaluation Methods

The evaluation format has been designed to complement learning in the undergraduate medical programme. Evaluation methods have been developed to measure how well the student achieves the stated educational objectives in the various units of the programme. Continual evaluation of the student occurs within the tutorial setting with input from students, their peers, and the tutor. Two problem-solving exercises are required in each unit. At the completion of the unit, the tutor is responsible for the final summary statement of student learning progress. The tutor prepares a written summary of observation of the student's performance in the tutorials and associated activities. A copy of the evaluation summary is given to the student and to the student advisor while the original is kept in the student's evaluation file.

The Curriculum Plan

The curriculum of the undergraduate medical programme comprises 6 Units, an Elective Programme and Revision Time. The Curriculum Plan showing the relative proportion of time accorded to these units is illustrated below.



There is less of a division between the preclinical parts and the clinical parts of the M.D. Programme than in more traditional schools. Patient contact and clinical skills development start in Unit I and increase throughout the programme. The scientific background for understanding patients' problems, while more intensley studied in earlier units, should continue as it is relevant to the care of any patient in any clinical situation.

Programme Outline for Unit 1: The goal of Unit 1 is to provide an introduction to the undergraduate medical programme, emphasizing a global view of the determinants of health and illness. Factors from both the external and the internal environment will be considered, as they determine the clinical presentation in an individual. Concepts and information from three knowledge perspectives will be studied: the population perspective, the behavioural perspective, and the biological perspective. Students will begin to acquire basic skills of critical appraisal, clinical skills and in particular learning skills. During this unit, students will become familiar with the health care system in the Hamilton region and the opportunities for learning which it offers.
This unit is the foundation for *all* the following units and not a specific preliminary to Unit 2.

Programme Outline for Units 2-4: These units are concerned with the systematic study of human structure, function and behaviour and is organized around systems of the body, as follows:

Unit 2	Cardiovascular, Respiratory and Renal Systems
Unit 3	Hematologic, Gastroenterologic and Endocrine Systems
Unit 4	Neurologic, Locomotor and Behavioural Systems

There is an emphasis on critical appraisal of evidence, on clinical skills and learning skills.

Programme Outline for Unit 5: This unit is organized on the overall theme of *The Life Cycle.* Health care problems from the community are studied. Major themes include reproductive health, child and adolescent health, occupational and environmental health and geriatric health. Students have an opportunity to consolidate their clinical, learning and critical appraisal skills in anticipation of the clerkship. There will be opportunities to make field trips to a variety of health care settings and agencies.

Programme Outline for Unit 6: The Clerkship: In this component of the programme students participate in the direct care of patients, and the management of health and illness. All prior objectives apply, but the *health care problems* are actual patients. Students become self-sufficient in contemporary medicine, but are able to sense when today's medicine becomes out-of-date by adopting good habits of learning and assessment.

The Clerkship Programme consists of rotations in Medicine and Surgery, Family Medicine, Psychiatry, Pediatrics, and Obstetrics and Gynecology, and in elective time of which one-half must be spent in clinical medicine. The compulsory components of the clerkship are carried out in teaching practices and in the teaching hospitals in the Hamilton region, including McMaster and Chedoke Divisions of Chedoke-McMaster Hospitals, Hamilton General Hospital, Henderson General Hospital and St. Joseph's Hospital. The elective experience can be spent in various activities utilizing local, regional or distant resources.

Electives: Electives are an integral part of the Curriculum Plan. They may be considered the epitome of self-directed learning since students must define goals for electives which are appropriate for their own learning objectives. The responsibility for planning electives rests with each student in collaboration with the student advisor.
The **two types of electives** in the undergraduate medical programme are:

1. **Block Electives:** These are sections of the curriculum for full-time elective activities. Block Electives occur after Unit 3 (6 weeks), after Unit 4 (6 weeks), and during the Clerkship (16 weeks).
2. **Horizontal Electives:** These are undertaken concurrently with other parts of the curriculum. Horizontal electives are entirely voluntary and are not required for completion of the programme. It is particularly important that the student's advisor be involved in all decisions concerning horizontal electives.
3. **Enrichment Electives:** These are arrangements and in place for students from each class to devote longer periods of time (from 6 to 12 months) to the pursuit of special academic experiences. The intent is to encourage students to explore possible careers in special "frontier" areas of medicine and health care. Examples include: research training and experience; community health projects; international health opportunities. These experiences are often undertaken following Unit 5 or during the first half of Unit 6. Some experiences may provide partial funding (e.g. by student research fellowships).

Regulations for Licence to Practise

A degree in medicine does not in itself confer the right to practise medicine in any part of Canada. To acquire this right, university graduates in medicine must hold a certificate of the College of Physicians and Surgeons of the province in which they elect to engage in practice. Students in Ontario medical schools are not required to register as students with the College of Physicians and Surgeons of Ontario. Students intending to practise outside Ontario are urged to consult the licencing body of that province regarding registration.

The College of Physicians and Surgeons of Ontario does not conduct a licencing examination. It, however, issues enabling certificates that allow the final year student in an Ontario medical school the right to take the Medical Council of Canada examinations. After having passed this examination the graduate must provide evidence of having completed one year of acceptable postgraduate experience in a hospital approved by the College of Physicians and Surgeons of Ontario before being licenced to practise in this province.

Canadian Intern Matching Service

The Matching Service is a clearing-house designed to help final year Canadian medical students obtain the first post-M.D. year programme of their choice, and to help programme directors obtain the students of their choice. It provides an orderly method for students to decide where to train and for programme directors to decide which applicants they wish to enrol. For both students and directors, it removes the factors that generate unfair pressures and premature decisions.

Further information is available from the Office of the Assistant Registrar (Health Sciences).

ADMISSION POLICY FOR THE MEDICAL PROGRAMME

Since the admission policy is reviewed annually, the admission requirements may change. The following are the requirements for ***admission in September 1990.***

Because of the nature of the selection procedures, the School of Medicine enforces deadlines strictly and requires that all required documentation be provided by the specified deadline. Applicants must follow the instructions precisely.

Selection Procedure

To meet the current and anticipated health needs of both individuals and the community, a student in the programme requires the ability to examine biological, behavioural and population perspectives on health problems and to develop personal characteristics and attitudes required for a medical career. The candidate is selected with these criteria in mind. Faculty, current students and members of the community are normally involved in the review of applications.

Application to the medical programme implies acceptance by the candidate of the admission policies and procedures, and the methods by which candidates are chosen for the programme. If you fail to comply with the instructions or to meet the deadlines your application will be cancelled.

Applications must be submited by **November 1, 1989**. Aproximately 400 applicants will be invited for interviews in Hamilton in March or April on the basis of their academic records and an assessment of their autobiographical letters. From this group a class of 100 is selected.

Application Procedure

All application materials are to be submitted directly to the Ontario Medical School Application Service (OMSAS).

By November 1, 1989, applicants must submit:

1. a completed application and the application fee;
2. the Autobiographic Sketch on page 4 of the application form; and
3. a 4-page autobiographical letter as described in the application package.

Applicants must ensure that the following documents are received at OMSAS by December 29, 1989:

1. transcripts from all post-secondary institutions attended;
2. the letters of reference.

Applications for which information is not received by the deadlines will not be considered.

Academic Eligibility

By September 1, 1990 applicants must have completed a minimum of 3 years' work in an accredited university with at least a second-class ('B') average overall. Two of the three years must be above level one. A 'year' is the full block of work specified for a year or level of the programme in the appropriate university calendar. If requested, applicants must provide evidence that the requirements above have been met.

The OMSAS cumulative converted average will be calculated for work completed prior to November 1st. A 'B' average is an OMSAS cumulative converted average of at least 2.50. Higher weighting may be given to more recent work.

An applicant who has completed a diploma at a CEGEP must have completed by September 1, 1990 at least 2 additional years at an accredited university, one of which must be a full programme of courses above level one.

Graduate work may be taken into account to establish eligibility.

Other candidates who have completed the requirements for a baccalaureate degree with at least a second class ('B') average overall before November 1, 1989 will be considered.

Academic Assessment

Course grades will be used to calculate two averages:

1. a simple average in which the work of different years is treated equally.
2. a weighted average in which the last recorded academic year is given a weight of three, the next to last recorded academic year is given a weight of two, and all other years are given a weight of one.

The higher of the two averages is used. (Please note that the OMSAS Verification Report will provide only the simple average).

Applicants must report on the OMSAS Academic Record Form **all** grades received in post-secondary courses in which they have ever registered. If the university programme required work terms, applicants should ensure that the employers' evaluation of the work terms is included with the application. Failure to report any courses, programmes or grades will result in cancellation of the application.

An applicant presenting academic work which cannot be converted to the OMSAS values by using the OMSAS Conversion Table will be assigned the median grade point average of the eligible applicant pool.

Completed graduate work offered by an applicant will be assigned the median grade point average of the eligible applicant pool.

Applicant's Letter and Autobiographic Sketch

The Applicant's Letter and the Autobiographic Sketch (page 4 of the application form) will be assessed by a team normally composed of a faculty member, a student and a member of the community. The assessment is based on personal characteristics which the Undergraduate Medical Programme Admission Committee believes are important for the practice of medicine and for a student to be successful at McMaster.

The score resulting from this assessment of personal qualities is weighted equally with the grade point average in the decision of who will be invited to an interview.

Geographical Consideration

The *bona fide* place of residence will be used in the following order of priority to select applicants for interview.

1. Hamilton Health Region and Northwestern Ontario (defined as west of Wawa to the Manitoba boundary);
2. the rest of Ontario;
3. the rest of Canada; and
4. other countries.

To qualify for 1 or 2 above, an applicant must be a Canadian citizen or permanent resident by November 1, 1989 and have resided for at least 3 years in the area since the age of 14. Attendance at a university in the area for at least 3 years by the date of possible entry to the programme satisfies the second requirement.

Any other applicant who is a Canadian citizen or permanent resident qualifies for 3.

All other applicants qualify for 4. While all applicants in category 4 are considered, they may be selected for interview only if they are judged on each criterion to be clearly superior to other applicants.

The geographical status is determined from the Autobiographic Sketch. Applicants must, therefore, note their assessment of the geographical status clearly at the top of the Autobiographic Sketch form. Applicants may be asked to provide evidence of geographical status.

Interviews

Approximately 400 applicants will be invited to Hamilton for interviews. The selection of these applicants is based on academic achievement, on personal qualities as judged by reading the Applicant's Letter and Autobiographic Sketch, and on geographical consideration.

Because the interviews involve many other people, applicants must attend on the date and time specified. Applicants are responsible for their own travel expenses. All interviews will be held on two weekends in late March or early April.

Selection

All the information presented will be reviewed and used for the final selection. Successful applicants will be notified the last working day in May, 1990.

Special Applicants

This category is designed to provide opportunities only to those who have not attended a post-secondary institution as a full-time student, or have completed less than 10 full courses as a part-time student.

To be considered under this category, applicants must:

1. have completed at least 4 full degree credit courses with the equivalent of an overall grade point average of 'B';

2. have been employed or active in the community for at least 7 years since leaving high school;
3. be residents of Ontario;
4. have made an exceptional contribution to society. In this, the candidate must have shown creativity, initiative and leadership.

Applicants who believe they are eligible for this category, **must** contact the Assistant Registrar (Health Sciences) before making a formal application so they can be advised on whether they may qualify for this category. Special Applicants are subject to the same application deadlines as regular applicants.

Advanced Standing
Applications for Advanced Standing will be considered **only** under exceptional circumstances. Admission with Advanced Standing is conditional upon the availability of resources and will not affect the number of students admitted by the regular route.

Applicants for Advanced Standing must provide evidence to show that their *undergraduate medical education has been or will be either terminated* or *delayed for at least two years by circumstances beyond their control*. Those who already possess an M.D. degree will *not* be considered for Advanced Standing.

In addition, applicants must have:

1. successfully completed three years of university education at the time of application;
2. must have been given refugee status by the Canadian Immigration authorities, if not Canadian citizens or landed immigrants to Canada.

Those who believe that they are eligible for this category **must** contact, *in writing*, the Chairman of the Admissions Committee of the Undergraduate Medical Programme or the Assistant Registrar (Health Sciences), *before* making formal application. Unless the applicants for advanced standing can demonstrate the need for urgency in the handling of their application, they are subject to the same formal application deadlines as regular applicants.

FINANCIAL INFORMATION

Financial difficulties are among the most frequent problems experienced by students in undergraduate medical schools. At McMaster, these are intensified by the lack of opportunity for summer employment as well as by the relative scarcity of financial assistance funds available to the medical school.

In this situation, it is incumbent on students admitted to the M.D. programme to clarify immediately their personal financial situation and to secure or identify sufficient support to meet their financial obligations over the subsequent three years. The School of Medicine cannot assume this responsibility.

In 1988-89, the academic fees (tuition and student supplementary fees) for a student in the McMaster Undergraduate Medical Programme were:

Canadian Citizens and Landed Immigrants	
Year I and II	$ 2935.
Year III	2019.
Visa Students	
Year I and II	11749.
Year III	7895.

In addition, the cost of books and diagnostic equipment for a Year I student was *approximately* $1500. Students are also responsible for their transportation costs related to clinical study.

Financial assistance is available from the federal and provincial governments through the Ontario Student Assistance Program (OSAP). To be eligible a student must be a Canadian Citizen or permanent resident of Canada and fulfill certain requirements for residency in Ontario. In addition, the following sources of funding are available to undergraduate medical students.

Abbott Memorial Scholarship Loan Fund This fund was established by the Federation of Medical Women of Canada. Small loans are available to any female medical student or first-year intern. In special cases, a loan up to $1,000 may be made to a student for recognized postgraduate training. Loans are payable within five years of date of issue, after which time interest will be charged at a rate of 5% compounded annually. Information regarding these loans may be obtained from the Secretariat, Federation of Medical Women of Canada, Box 8244, Ottawa, Ontario K1G 3H7.

Medical Officer Training Plan The Department of National Defence administers a programme for medical students known as the Canadian Forces Medical Officer Training Plan. Under this plan, students may be subsidized (tuition plus pay) throughout their undergraduate medical studies and internship. To qualify for enrolment a student must be acceptable without condition in a course in medicine in a Canadian university or in an accredited internship.

Further information on this programme and on the career opportunities in medicine in the Canadian Armed Forces may be obtained from local Canadian Forces Recruiting Centres. In Hamilton the Recruiting Centre is at 150 Main Street West. Telephone (416) 523-2751.

Final Year Clerkship Stipend The Ontario Hospital Services Commission will make a grant of approximately $4,000 to each student, payable in 24 monthly instalments, for educational development within a teaching hospital for the equivalent of 40 weeks in the final year.

In relation to the Ontario Student Assistance Program, the O.H.S.C. grant will be taken into account in assessing the amounts of the awards for those students who are eligible.

Other Funds The School of Medicine administers a small loan and bursaries programme to assist some medical students who may be in need. Unfortunately, these funds are limited and cannot be relied on to meet a major portion of any student's financial obligations. The source of these funds includes: The Ontario Medical Association Bursaries and Loan Fund; The William Andrew Vanderburgh Sr. Memorial Fund; and the Ripley Estate Bursary and Loan Fund.

For further information, contact Dr. R.G. Butler, c/o the Student Affairs Office, at extn. 2271.

Academic Awards The School of Medicine has in the past indicated its preparedness to recognize students who distinguish themselves and the University by virtue of their scholarship and their contribution to the university community. At the same time, the School has indicated that the terms of reference for such awards should neither compromise the spirit of co-operative scholarship which characterizes its M.D. programme nor replace its priority of concern for financial assistance awards.

A small, but growing number of estates and agencies have donated funds to the University and the School of Medicine for purposes of recognizing scholastic merit among medical students. In order to meet the requirements of these awards within the spirit of co-operative scholarship, these funds are administered by the School's Student Financial Aid Committee to support individual students in their pursuit of specific elective projects or activities.

Students are required to submit an application through the Student Affairs Office, outlining the nature of their work and the need for funds. For further information, contact Dr. R.G. Butler, at extn. 2271.

The School of Nursing

In 1942, McMaster University began its first programme in Nursing, which was operated co-operatively by the University and the Hamilton General Hospital. Since the establishment of McMaster University's School of Nursing in 1946, students have received a Bachelor of Science in Nursing degree upon graduation. The programme has functioned completely under the supervision of the University, while enjoying the full co-operation of community hospitals and agencies in the operation of its clinical courses. In July, 1974, the Schools of Nursing and Medicine became the Faculty of Health Sciences.

In 1982, the Post Diploma Stream of the B.Sc.N. Programme was introduced. There has been a high demand for admission to this Stream. In response, a Collaborative Category has been added to the existing Open Category. This second Collaborative Category provides expanded opportunites for Diploma Registered Nurses. The Collaborative Category has been designed with the active support and involvement of health institutions in the Hamilton-Wentworth Region. A description of the Open and Collaborative Categories is provided below in the section *D. Diploma Registered Nurses (B) Stream*.

Applicants often wish to discuss the implications of embarking upon a degree programme in nursing. During the school year Health Sciences Information Sessions are presented. Information about these sessions may be obtained from the Student Liaison Office (Gilmour Hall, Room 102, Ext. 4787). Any applicant wishing to discuss aspects of the admission process to the B.Sc.N. programme should write to the Assistant Registrar (Health Sciences) for information or make an appointment for an interview (Health Sciences Centre, Room 1B7, Ext. 2115). In addition, applicants may wish to discuss their career goals in nursing with a faculty member of the School of Nursing. Appointments can be arranged through the Assistant Registrar's office.

Applicants who are accepted into the programme are invited each June to attend counselling sessions before making their decision to accept or decline the offer. This is done in order that they may assess for themselves their suitability for the McMaster Nursing programme. Details of these counselling sessions are forwarded with the letters of acceptance.

THE B.Sc.N. PROGRAMME

The School of Nursing is committed to education, research, and service. As students progress in the B.Sc.N. programme, they will find an ever increasing emphasis on interpersonal skills, independent learning, and leadership qualities. Although these skills and attitudes may not be assessed prior to admission, applicants should evaluate their own potential for developing abilities to interact with others and to assume leadership roles.

Learning takes place in an environment conducive to openness and sharing among faculty and students. Emphasis on small group tutorials and self-directed learning promotes the development of self-evaluation skills and problem-solving abilities. Extensive audio-visual, laboratory and library resources support a belief in the importance of independent study. Experiences in controlled settings, such as the use of simulated patients and clinical settings, focus on nursing problems and processes which students examine critically and to which they apply concepts from nursing and related disciplines.

Evaluation by self, peers and faculty is part of an on-going process of assessment of the achievement of clinical, course, and programme objectives.

Objectives of the B.Sc.N. Programme

The aim of the B.Sc.N. programme is to provide students with a broad university education as nurses which will enable them to function as beginning practitioners in primary, secondary and tertiary health care settings. The programme will enable graduates to respond to the existing and changing nursing and health needs of society.

The central competence to be achieved is the ability to use systematically biologic and psychosocial knowledge in the understanding and nursing management of patients' health and health care problems.

In order to achieve this goal, the following will be demonstrated.

Knowledge:

1. identify the important influences on the health status of individuals and groups;
2. identify and implement practices which promote improved health;
3. identify and define health/illness problems at the individual, family and community level;
4. understand the underlying biophysical and psychosocial mechanisms of health/illness problems;
5. define the physical, emotional and/or social aspects of health problems and provide nursing care of patients and/or families;
6. understand major influences on the health care system, most specifically on the provision of nursing services throughout that system.

Skills:

1. critically appraise information from a variety of sources: health care research, humanities, behavioural and biological sciences; and integrate this information and evidence with the theories and practice of nursing;
2. provide nursing care in a variety of health care settings;
3. continue to recognize personal learning needs, select appropriate learning resources and evaluate personal progress.

Personal Qualities:

1. maintain and further develop such personal characteristics as:
    a. awareness of personal assets, potential and limitations;
    b. awareness of own and others contribution to patient care;
    c. responsibility for effecting change;
    d. ability to relate to and show concern for other individuals;
    e. demonstration of ethical behaviour and professional accountablity in health care practice;
2. function as a contributing member of multidisciplinary groups in the identification, resolution and management of health problems.

ADMISSION REQUIREMENTS

ADMISSION POLICY AND PROCEDURE

As places in the B.Sc.N. programme are limited admission is by selection of applicants, and possession of published minimum requirements does not guarantee admission.

There are **two streams of study** for the completion of the B.Sc.N degree. The Basic (**A**) Stream requires four years of study, and is available to: applicants *directly* from Ontario secondary schools (or with equivalent qualifications); applicants with other qualifications including mature students and university/college students; and, applicants currently enrolled in a Nursing degree programme. Diploma Registered Nurses in Ontario, enter the Diploma R.N. (**B**) Stream. There are two categories in the Diploma R.N. (B) Stream; the Open Category; and, the Collaborative Category.

The requirements and application deadlines vary depending on the applicant's background. Please note carefully the sections that follow as to procedures and requirements.

Applicants from Ontario Secondary Schools: The major portion of places for Level I are held by Grade 13/OAC or equivalent students. The selection method is by academic qualifications. Either interim or final grades provide the academic base calculated the first part of June.

Applicants with Other Qualifications: The selection method is based on academic qualifications, a personal qualities' score and interview score.

A complete application includes the applicant's response to a questionnaire. The response is assessed by teams of assessors normally representing the faculty and student or alumni constituencies. A portion of applicants with the highest questionnaire response scores are invited to an interview in May. Applicants are responsible for their own travel expenses. Failure to attend the interview will result in cancellation of the application. The scores awarded by the assessors for both the questionnaire response and interview are final.

All appplicants will be informed of the admission decision in mid-June. Where courses were in progress at the time of application, the offer of admission may be conditional upon final achievement in these courses. Failure to meet the condition will result in withdrawal of the offer of admission.

Admission Procedure: Applications for all studies beginning in September must be postmarked no later than midnight of the previous **May 1 for Grade 13/OAC applicants** *and* **February 15 for applicants with other qualifications.**

Applicants currently in Grade 13/OAC apply through the Ontario Universities' Application Centre. Application forms are available in secondary school guidance offices.

Applicants with other qualifications should write to the Assistant Registrar (Health Sciences) for an application form.

All application forms must be completed and forwarded to the Ontario Universities' Application Centre. Transcripts from the secondary schools and any post-secondary eduactional courses either completed or in progress must be included with the application by the deadline date.

Students enrolled in other programmes at McMaster University wishing to be considered for transfer to the B.Sc.N. programme should apply through the Office of the Assistant Registrar (Health Sciences) by February 15th.

ADMISSION REQUIREMENTS

If you plan to enter a nursing programme, you may qualify under one of the four categories (A to D) described below.

A. Applicants to the Basic (A) Stream from Secondary Schools

1. Applicants from Ontario Schools: (Who have Not Attended University) To be eligible for consideration, Ontario candidates must have completed:

- i. Year 4 Mathematics (Advanced Level);
- ii. OAC Chemistry *and* OAC English;

iii. one of OAC Biology, OAC Mathematics, OAC Physics;
iv. additional OACs (within 2 years prior to application) to total 6 credits. At least two of the additional OACs must be selected from français, other languages, Calculus, Algebra and Geometry, Finite Mathematics, Biology, Physics, Geography, History and Music.

The admission average will be calculated on the best six of the *required* Grade 13/OAC subjects.

At the time of writing, Grade 13 courses are being phased out and being replaced by Ontario Academic Courses (OACs). During the transition period we shall treat the two sets of courses as equivalent. The requirements above are written in terms of OACs for which Grade 13 courses may generally be substituted.

2. **Applicants with Qualifications Equivalent to OAC/Grade 13:** Applicants from other provinces and countries must present qualifications equivalent to those listed above. Those students who qualify in January for admission based on their secondary school graduation year grades and who choose to take university courses beginning in January will be considered for the B.Sc.N. programme as an applicant directly from secondary school, for the following September.

B. Applicants to the Basic (A) Stream with Other Qualifications

Applicants who do not qualify under Category A normally should:

i.a be currently enrolled in first year of a University programme with a university admission average of 75%; or
i.b if attending university on a part-time basis, provide evidence of achievement of a minimum of B– in 12 units (or equivalent) of university degree credit courses in the past two years; or
i.c if attending university on a full-time basis, provide evidence of a minimum of B– in at least five 6-unit (or equivalent) university degree courses within the past two years;
(Applicants under this category who are *not currently* enrolled in a university course/programme should consult the Assistant Registrar (Health Sciences).
ii. submit a completed original and two (2) copies of their response to the questionnaire provided in the application packet;
iii. submit three (3) completed reference forms from non-relatives, including one person qualified to address the appplicant's academic capabilities. Reference forms will be provided in the application packet.

Applicants will be evaluated on the basis of the material submitted in 1, 2 and 3 above. Those ranked highest may be invited to come to McMaster for a problem-solving exercise and/or personal interview. Applicants are responsible for their own travel expenses.

C. Admission Above Level I (A) Stream

Applicants who are currently enrolled in a Nursing degree programme at another university and who wish to transfer to Level II or above at McMaster should:

i. send a written request to the Chairperson, Undergraduate Nursing Admissions Committee outlining their request;
ii. submit evidence that the applicant is considered in "good standing" by the Dean of their present programme;
iii. submit transcripts of completed courses.

The applicant may be invited to McMaster for a personal interview. Applicants are responsible for their own travel expenses.

Availability of space in the level requested will be determined by the Chairperson of the Bachelor of Science in Nursing programme. Even if no space is available, the applicant may choose to complete the admission process and be placed on a waiting list.

D. Diploma Registered Nurses (B) Stream

Any nurse *holding, or being eligible for*, nursing registration prior to the date of entry to the programme will be considered for admission to the Diploma R.N.(B) Stream of the Undergraduate Bachelor of Science in Nursing programme.

Applicants *currently enrolled* in a diploma nursing programme will be considered in Category B above.

The University does not grant advance credit for diploma nursing courses.

There are two categories within the Diploma R.N. (B) Stream.

1. **The Open Category:** The Open Category is open to *all* diploma registered nurses who meet the following conditions.
   Applicants in this category normally should:
   i. possess a current Certificate of Competence as a Registered Nurse in Ontario, be eligible for reciprocity, or be eligible to write and subsequently pass the Certification examinations.
   ii. show evidence of at least two years fulltime, or equivalent, nursing practice within the five years prior to date of entry to the programme.
   iii. provide evidence of a minimum of a B– grade in at least 6 units (or equivalent) of University degree credit work within the past five years. University correspondence degree courses are acceptable.
   iv. submit a completed original and two (2) copies of their response to the questionnaire provided in the application packet;
   v. submit three (3) completed reference forms provided in the application packet. References should be from non-relatives, and should include at least one person who is qualified to address the appplicant's professional and academic capabilities.

   Applicants will be evaluated on the basis of the material submitted in 3, 4 and 5 above. Those ranked highest may be invited to come to McMaster for a problem-solving exercise and/or personal interview. Applicants are responsible for their own travel expenses.

2. **The Collaborative Category:** The new Collaborative Category was developed in conjunction with specific health care institutions in Hamilton-Wentworth. Further information about this Collaborative Category is available from the Assistant Registrar (Health Sciences), or the School of Nursing.

   Candidates wishing to apply to the Collaborative Category should normally satisfy all those conditions noted *above* in the Open Category. *In addition* they must provide a supporting letter from their Director of Nursing. Students applying to the Collaborative Category may also apply to the Open Category.

ACADEMIC REGULATIONS

In addition to meeting the General Academic Regulations of the University, students enrolled in the B.Sc.N. programme shall be subject to the following programme regulations.

Registration in the B.Sc.N. Programme implies acceptance on the part of the student of the objectives of that Programme and the methods by which progress toward the achievement of those objectives is evaluated.

Since the academic regulations are continually reviewed, we reserve the right to change the regulations in this section of the Calendar.

The University also reserves the right to cancel the academic privileges of a student at any time should the student's scholastic record or conduct warrant so doing. Where, in the opinion of faculty, the performance of the student in clinical nursing practice may jeopardize or endanger the welfare of the patient, or the patient's family, the student may be removed from clinical experience any time during the academic year until continuation in the course is reviewed. The clinical activities associated with any clinical course must be successfully achieved for attainment of a passing grade in the course.

Part-Time Students

Students will be permitted to enter, proceed through and graduate from the B.Sc.N. programme (A) or (B) stream, on a part-time basis. University and programme regulations governing the full-time undergraduate students will govern the part-time student.

As enrolment is limited, places reserved for part-time students at each Level will be restricted. Normally, Nursing courses are available only during the day. Electives may be taken either in the day or evening. Independent study packages are also being developed.

Guidelines have been established for part-time study. Applicants are advised to seek counselling from the School of Nursing before engaging in part-time study.

Level I Nursing

A student in Level I must:

1. achieve a University Average (UA) of at least 2.5; and
2. achieve an average of at least 4.0 in the Nursing and required Health Science courses; and
3. achieve a grade of at least C− in the Nursing and required Health Science courses with the exception that a grade of D−, D, or D+ is permissible in one Health Science course.

A student who fails to meet these requirements may not continue in the programme but may seek readmission by writing to the B.Sc.N. Programme Chairman.

Area Courses:

The Area courses consist of all the Nursing and Health Science courses above Level I.

The following courses are designated *clinical courses*:

Basic (A) Stream	Nursing 2L06, 2H04, 3X07, 3Y07, 4J07, 4K07.
Diploma Registered Nurses (B) Stream	Nursing 3L05, 3M05, 3N08, 4S06, 4T06.

A grade of at least C− is required in all Area courses with the exception that a grade of D−, D, or D+ is permissible in a non-clinical Area course only once beyond Level I. In order to meet these requirements an Area course may be repeated only once. If a student fails to meet the minimum grade requirements after repeating the course, he or she *may not continue* in the Nursing programme.

A course for which credit has been granted may be repeated only when approval is granted by the B.Sc.N. Programme Chairman.

Cumulative Area Average (CAA)

The Cumulative Area Average (CAA) for the B.Sc.N. programme is the weighted average of all the Nursing and required Health Sciences courses attempted and repeated beyond Level I, and is used to determine whether a student may continue in the programme, may continue on Programme Probation, or may not continue in the programme.

Continuation in the Programme

To continue in the B.Sc.N. programme a student must obtain a University Average (UA) of at least 2.5, a Cumulative Area Average of at least 4.0, and meet the minimum requirements of the Programme. A student whose CAA is at least 3.5 may, at the discretion of the Faculty, proceed in the programme and will be placed on *Programme Probation*. A student may be placed on Programme Probation only once during the total programme.

Failure

A student whose Cumulative Area Average is less than 3.5, or whose CAA is less than 4.0, and who has not been granted Programme Probation, may not continue in the programme. A student who fails to obtain a Cumulative Area Average of 4.0 at the completion of the period on Programme Probation, may not continue in the B.Sc.N. programme. A student may normally repeat a Level of work only once.

Extra Courses

Courses in addition to those which constitute the B.Sc.N. programme may be designated *Extra* at registration. The grades obtained in such courses will not be included in the CAA nor will the units be included in those required for graduation. The designation *Extra* cannot be added or removed retroactively.

Level of Registration

Level describes where a student is placed in the programme. A student is required to register in that Level for which more than 6 units of work is incomplete. Work of a higher Level may be undertaken, if prerequisites are met, with the permission of the Programme Chairman.

Selection of Electives

After a student has completed Level I he or she may take no more than 18 units of courses beginning with the digit 1.

Graduation Average (GA)

The Graduation Average (GA) for the B.Sc.N. programme is based on the best 36 units or best 80% of all Level III and Level IV Area courses, whichever is greater. The GA is used to determine whether a student may graduate from the programme.

CURRICULUM FOR THE B.SC.N. PROGRAMME

Basic (A) Stream

The Faculty has planned the curriculum so that the study of nursing, the physiological, psychological and social sciences, and the humanities are interrelated and span the entire programme. In Level I, the amount of nursing experience is relatively small; the major proportion of study is in the behavioural and natural sciences. The nursing component increases progressively through Levels II, III, and IV, as the study of natural sciences is completed. Normally, because of timetable constraints, courses must be taken in the Level indicated in the curriculum.

Six units in Sociology or Anthropology are required by the end of Level II. In at least one of Levels I, II, III, or IV, six units of elective are to be chosen from the Humanities, and six additional units from one of Psychology, Sociology, or Anthropology are to be chosen at or above Level II.

Level I: 32 units
R Health Sciences 1A06, 1B07; Nursing 1F07; Psychology 1A06.
E 6 units.

Level II: 38 units
Terms 1 and 2: 34 units
R Health Sciences 2B08; Nursing 2L06, 2M05;
E 15 units.
Term 3: 4 units
R Nursing 2H04.

Level III: 33 units
R Health Sciences 3A04, 3B04; Nursing 3S08, 3X07, 3Y07.
E 3 units.

Level IV: 32 units
R Health Sciences 4L04; Nursing 4A02, 4E06, 4J07, 4K07.
E 6 units.

Diploma R.N. (B) Stream

The programme of study for Diploma Registered Nurses is integrated with existing course offerings. The practice of nursing in diverse clinical settings will occur in all academic terms. The curriculum is designed to build on the existing knowledge and skills of the students, to prevent duplication of learning experiences and to prepare the students to function in the expanded role in community and institutional settings.

The curriculum is planned for two full calendar years if taken on a *full-time* basis. If taken on a *part-time* basis, students are normally allowed six years in the Open Category to complete the programme requirements. Students in the Collaborative Category must elect to take their programme in either four years or five years and indicate their preferred choice at the time of acceptance into the programme.

Each level of the programme will consist of eight months of academic study with concurrent clinical practice. Level III is followed by 6 to 8 weeks of concentrated clinical practice in one setting. The concentrated experience is designed to provide the student with the opportunity to develop areas of specific interest and to demonstrate decision-making capacity in those areas such as primary care, oncology, gerontology, etc.

Electives: Thirty (30) units of electives are to be selected from disciplines of the student's choice, of which a minimum of 12 units are to be chosen from courses designated as Level II or above.

Level III: 55 units
Terms 1 and 2: 35 units.
R Health Sciences 1A06, 1B07, 3A04; Nursing 3L05, 3M05, 3S08.
Term 3: 14 units
R Nursing 3N08.
E 6 units.
Summer Term
E 6 units.

Level IV: 54 units
Terms 1 and 2: 36 units
R Health Sciences 2B08, 3B04, 4L04; Nursing 4A02, 4E06, 4S06, 4T06.
Term 3: 6 units
E 6 units.
Summer Term: 6 units
E 6 units.
Additional Electives: 6 units
E 6 units.

Occupational Therapy and Physiotherapy Programme

The Bachelor of Health Science Programme is available to diploma graduates of the Mohawk College programmes in Occupational Therapy or Physiotherapy and diploma graduates in Occupational Therapy and/or Physiotherapy from other institutions. Through an emphasis on the synthesis of the theoretical and clinical components of practice, the programme provides an opportunity for increased academic and scholarly preparation. In this way, the student will acquire an improved understanding of the health care problems of clients.

Further professional development is offered through the various Master and Doctoral programmes in the Faculty of Health Sciences.

In anticipation of the implementation of the new programmes described below, the current Bachelor of Health Science Programme is under review. It is expected that ***the last intake into the B.H.Sc. Programme from the Mohawk College programmes in Occupational Therapy or Physiotherapy will be in September 1991***, and that ***the last entry into the Pre-Programme Phase*** (for applicants from other institutions) ***will be in September 1989.***

McMaster University, in co-operation with Lakehead University, is planning new programmes in Occupational Therapy and Physiotherapy. These 2-year programmes will be available to candidates who hold a baccalaureate degree, with an overall standing of at least a 'B'. Since enrolments in the programmes will be limited, admission will be by selection. Possession of the minimum qualifications will not guarantee admission. These programmes have been approved in principle by the Ontario Council on University Affairs. Implementation is contingent upon funding being provided by the Ministry of Colleges and Universities. The programmes are expected to commence in the Fall of 1990.

These will be 23-month programmes spread over 2 calendar years. The curriculum is focused on the problem-based small-group tutorial methods pioneered in the McMaster undergraduate medical programme and other undergraduate programmes in the Faculty of Health Sciences such as the Mohawk/McMaster diploma programmes in Occupational Therapy and Physiotherapy. It is anticipated that students will have an option to participate in a 14-week block of northern studies based at Lakehead University.

OBJECTIVES OF THE B.H.Sc. PROGRAMME

The Programme is designed to further the development of an occupational therapist or physiotherapist who will be able to:

1. Understand the physical, biological and behavioural mechanisms of health problems including aspects such as molecular, individual, family and community.
2. Understand the political, economical, sociocultural and epidemiological factors which influence health policies and the systems and models of health care delivery.
3. Examine in depth, issues related to the responsibilities of the professions of Occupational Therapy and Physiotherapy in the delivery of health services.
4. Analyze and critique the scientific bases of the professions of Occupational Therapy and Physiotherapy, and critically evaluate emerging data related to these professions.
5. Plan and complete an investigation into a specific area of clinical practice. Principles of scientific inquiry and clinical reasoning will be emphasized.
6. Develop and measure self-assessment and self-directed learning skills for continued personal and professional growth.
7. Develop scholarly writing skills.

ADMISSION POLICY AND PROCEDURE

A. Applicants from Mohawk College Programmes in Occupational Therapy and Physiotherapy

The Faculty of Health Sciences, McMaster University, participates with the Faculty of Health Sciences at Mohawk College in the diploma programmes of Mohawk College in Occupational Therapy and Physiotherapy. To be considered for **admission to the B.H.Sc. Programme**, graduates from the Mohawk programmes should present:

1. Mohawk College Diploma of Occupational Therapy or Physiotherapy with the certificate from McMaster University.
2. Official transcripts from Mohawk College.
3. All transcripts from other post-secondary institutions attended.
4. A letter outlining the candidate's learning objectives.
5. A personal interview may also be required.

Applicants currently in **Year III** of the Occupational Therapy or Physiotherapy Programmes at Mohawk College should present:

1. Official transcript of marks of work completed (to date) at Mohawk.
2. A letter from the Programme Chairman assessing the student's potential to graduate.
3. All transcripts from other post-secondary institutions attended.
4. A personal interview may also be required.

B. Applicants with Diplomas in Occupational Therapy and/or Physiotherapy from Other Institutions

Successful applicants register in the Faculty of Health Sciences and must complete a minimum of 31 units of required study in the **Pre-programme Phase** at McMaster University **before** being eligible for admission to the B.H.Sc. Programme. Because of the planned development of new undergraduate programmes in Occupational Therapy and Physiotherapy, 1989 will be the last year for admission into the pre-programme phase.

Admission is by selection as enrolment is limited. Possession of these published minimum requirements does not guarantee admission.

The Admissions Committee will review professional education, course transcripts, and clinical experience, and in its recommendation may require work in addition to the 31 units of required study.

To be considered for admission to the Pre-programme Phase, graduates presenting diplomas from institutions other than Mohawk College should present:

1. Diploma of Occupational Therapy and/or Physiotherapy.
2. Official transcripts from the diploma-granting institution.
3. Eligibility to practise in the jurisdiction which provided the professional training must be shown. The candidate must have successfully completed professional training which is judged to be the equivalent to the diploma component of the Mohawk/McMaster diploma programmes.
4. Canadian citizenship or landed immigrant status.
5. A letter outlining the candidate's learning objectives.
6. An interview.

C. Admission Procedures (All Applicants)

Application packages, including the application form and guidelines for the applicant's letter, are available from the Associate Registrar (Liaison and Admissions), Gilmour Hall, Room 120, McMaster University. These should be completed and forwarded to McMaster University in accordance with the instructions. Official transcripts of marks from Mohawk College or other diploma-granting institution must be provided by the student.

Applications and the letter outlining learning objectives must be **postmarked no later than April 1** for the classes beginning in September. It is the applicant's responsibility to ensure that all application documentation is received by **April 1**. The B.H.Sc Programme will not normally consider applications for admission after the April 1 deadline, unless written documentation is provided showing good cause, as determined by the B.H.Sc. Admissions Committee.

All applicants will be informed of the admission decision by **June 1**.

ACADEMIC REGULATIONS

Registration in the Bachelor of Health Science Programme implies acceptance on the part of the student of the objectives of that programme and the methods by which progress toward the achievement of those objectives is evaluated. The University reserves the right to cancel the academic privileges of any student at any time that the student's scholastic record or conduct warrant doing so. Where, in the opinion of the faculty, the performance of the student in a clinical setting may jeopardize or endanger the welfare or safety of the patient or the patient's family, the student may be removed from the clinical setting any time during the academic year, until continuation in the course is reviewed.

Graduation

In order to graduate, a student must obtain a Cumulative Area Average of at least 4.0 in all courses taken. Graduation standing will be determined on the basis of the C.A.A.

Dean's Honour List

The requirements for being named to the Dean's Honour List are as follows:

i. for **graduates of the Mohawk College programme**, a Graduation Average of at least 9.5 in the programme phase, and where named to the Dean's Honour list in the final year of the occupational therapy or physiotherapy diploma programme at Mohawk College; or

ii. for students **in the pre-programme phase**, a university average of at least 9.5 on at least 30 units of work; or

iii. for graduating students who **completed the Pre-programme Phase**, an average of at least 9.5 on the 19 units of degree work, and an average of at least 9.5 in the Pre-programme Phase on previous session(s) sufficient to include at least 11 units.

iv. for non-Mohawk College students who have completed the Pre-programme phase and are in the programme phase, a graduation average of at least 9.5 in the programme phase and Dean's Honours in the Pre-programme phase.

Occasional Students

Applicants holding a diploma in occupational therapy or physiotherapy may register as Occasional students in Health Sciences and take up to six/seven units of core courses in the B.H.Sc. Programme.*

Preference in required courses will be given first to students in the B.H.Sc. Programme and the B.H.Sc. Pre-programme Phase, and then to Occasional and Continuing students if space is available.

To be considered for admission as an Occasional student in Health Sciences, applicants must present the following documentation to the Associate Registrar (Liaison and Admissions), Gilmour Hall, Room 120, McMaster University:

1. Diploma of occupational therapy and/or physiotherapy, including an official transcript of marks;
2. All other official transcripts from post-secondary institutions attended; and
3. A letter outlining the applicant's academic plans and reasons for applying as an Occasional student to the Faculty of Health Sciences

*Students who are currently registered in the diploma programmes of occupational therapy or physiotherapy at Mohawk College may seek entry to another faculty as Occasional Students (see the *Admissions Requirements* section in this Calendar). Such students may not take Health Science courses although those who plan to enter the B.H.Sc. Programme later are encouraged to discuss their course selection with the Admission Chairman of the B.H.Sc. Programme.

Continuing Students

Continuing students are those who hold a university degree in occupational therapy or physiotherapy, and who are not proceeding to an advanced degree, but wish to take one or more undergraduate courses.

Continuing students may take Health Science courses at the discretion of the B.H.Sc. Student Studies Chairman and the instructor(s) concerned.

Preference in required courses will be given first to students in the B.H.Sc. Programme and the B.H.Sc. Pre-programme Phase, and then to continuing and occasional students if space is available. To be considered for admission as a Continuing student in Health Sciences, applicants must present the following documentation to the Associate Registrar (Liaison and Admissions), Gilmour Hall, Room 120, McMaster University:

1. Degree of occupational therapy and/or physiotherapy, including an official transcript of marks;
2. All other official transcripts from post-secondary institutions attended; and
3. A letter outlining the applicant's academic plans and reasons for applying as a Continuing student to the Faculty of Health Sciences.

For further information please refer to the more detailed section on Occasional and Continuing students in the section *Admission Requirements*, in this Calendar.

THE B.H.Sc. *PRE-PROGRAMME* PHASE REQUIREMENTS AND CURRICULUM

The Pre-programme Phase is for applicants with diplomas in occupational therapy and/or physiotherapy programmes from other institutions. It consists of a minimum of 31 units of study completed entirely at McMaster University. Additional course work to a maximum of 43 units may be required at the discretion of the Admissions Committee.

The Pre-programme Phase may be completed either full-time or part-time. Under normal circumstances, the Pre-programme Phase should be completed in one year as a full-time student, or three years as a part-time student.

The student must attain a University Average of at least 4.0, and a minimum grade of C− in each course taken in the Pre-Programme Phase. A student whose University Average is less than 4.0, or who has more than 6 units of study below C− may not continue in the preprogramme.

Students who do not meet the requirements on a first attempt will be reviewed by the Student Studies Chairman, *and* will require permission to continue in the Programme.

R The programme of required study consists of 31 units as follows: Health Sciences 3A04 and 3C03; 24 units chosen from the Faculties of Science, Social Science, Humanities or Health Sciences.

Upon successful completion of this Pre-programme Phase the student is admitted to the B.H.Sc. Programme.

THE B.H.Sc. *PROGRAMME* REQUIREMENTS AND CURRICULUM

The Programme consists of 19 units of study completed entirely at McMaster University, to include four Level IV required courses, and one or more undergraduate elective courses designated as Level III or Level IV.

All courses required for the 19 units of credit in the programme are Area courses.

The student must attain a Cumulative Area Average (CAA) of at least 4.0. A minimum C− is required in each course in the programme.

A student who fails to obtain a CAA of at least 4.0, or who obtains more than 4 units of F grades in the CAA, may not continue in the programme.

Course Load: The Programme is available in a modified full-load or part-time format. Full-load students will normally complete a minimum of 10 units of course work between September and December. The remaining course work may be completed in subsequent terms. Full-load students are advised not to carry a course load of greater than 16 units in one term. Written permission from the Student Studies Chairman is required to take a course load greater than 16 units in one term.

Students may choose to complete the programme on a part-time basis. Elective courses will be selected from courses available during the day or evening throughout the year. Required courses usually are available in Term I of the Winter Session (September to December) during the day. Under normal circumstances, part-time students are expected to complete the programme within three years. Permission of the Student Studies Chairman is required to alter this time limit.

Students who have completed electives on a part-time basis may transfer to full-load status to complete the required courses during Term I of the Winter Session. Requests for transfers must be received by **April 1** of the year in which the student seeks to register.

Repetition of a Course: To repeat a course for which credit has been obtained, approval of the Student Studies Chairman is required. Any course in which less than C− standing is achieved may be repeated only once. The grades of all attempts appear on the transcript and enter into the computation of the Cumulative Area Average.

Sequence of Courses: For students who request to study Health Sciences 4C03/4D03, priority will be given as follows:

a. B.H.Sc. students who have completed Health Sciences 4A03 and/or Health Sciences 4B04.
b. B.H.Sc. students
c. Other students

Enrolment in these courses is limited and where numbers warrant, a special allocation process will be implemented. Students who are not placed in their first choice will be offered a place in those courses that are not full.

The same clincal study area must be selected for Health Sciences 4C03 and Health Sciences 4D03. Permission of the instructor is required to register in Health Sciences 4D03 in a different term from Health Sciences 4C03.

Cancellation of a Required Course: The B.H.Sc. Programme offers all required courses within one academic year. Wherever possible, the Programme offers all the listed areas of clinical study (Health Sciences 4C03/4D03). If there is insufficient enrolment in any of the required courses (minimum of 5) the Programme reserves the right to withdraw the course, and re-schedule or replace the course within that academic year.

B.H.Sc. Programme Level IV: 19 units

R Health Sciences 4A03, 4B04, 4C03, 4D03.

E 6 units of Level III or IV courses chosen from Faculties within McMaster University. The student must meet the prerequisite requirements for the elective courses.

Faculty of Humanities

D.P. Gagan/B.A., M.A., Ph.D., Dean of Humanities
F.A. Hall/Assoc.Dipl., B.Mus., M.A., Ph.D., Associate Dean of Humanities (Studies)
P.A. Kalnins/B.A., Assistant to the Associate Dean
S.A. Richard/Student Advisor

The humanities tell us how men and women of our own and other civilizations have grappled with life's enduring, fundamental questions: What is justice? What should be loved? What deserves to be defended? What is courage? What is noble? What is base? Why do civilizations flourish? Why do they decline?...

Mankind's answers to compelling questions are available to us through the written and spoken word — books, manuscripts, letters, plays, and oral traditions — and also in non-literary forms, which John Ruskin called the book of art. Within them are expressions of human greatness and of pathos and tragedy. In order to tap the consciousness and memory of civilization, one must confront these texts and works of art.

William J. Bennett

The humanistic disciplines — philosophy, languages and literature, history, music, art and drama — are those fields of critical enquiry which help us to know ourselves through an understanding of humanity's creative and intellectual traditions, its moral and aesthetic values and its spiritual and material aspirations, and through the realization of human memory. The task of the humanistic scholar is to cultivate an appreciation for traditional learning, and to generate new ideas about the nature of human conditions; to discover, through historical perspective, the processes which link past and present; and to bring to bear on the problems of an age of rapid and often unsettling transformation perceptions informed by values which make us more, rather than less, human and civilized.

The attainment of precise knowledge and fresh insights through lectures, class discussions, reflection, analysis and writing is the essence of study in the Faculty of Humanities' eight academic departments and two interdepartmental programmes. These are:

Department of Art & Art History
Department of Classics (Greek, Latin, Classical Civilization)
Department of English
Department of French
Department of History
Department of Modern Languages (German, Hispanic Studies, Italian, Russian)
Department of Music
Department of Philosophy
Drama Programmes
Humanities Interdisciplinary B.A. Programme

In addition, the Faculty offers the following two new interdepartmental programmes:

Honours Comparative Literature
Honours Modern Languages and Linguistics.

Programmes and Degrees

A. LEVEL I PROGRAMMMES

Admission Requirements

Students intending to qualify, after Level I, for admission to a degree programme in one of the Humanities disciplines should complete **Humanities I.** Students intending to enrol in a degree programme in Music should complete **Music I**, although students may enter a B.A. programme in Music from Humanities I.

The admission requirements for Humanities I and Music I are described in the *Admission Requirements* section of the Calendar.

Level I Programme Requirements

Students admitted to **Humanities I** must complete 30 units of work as follows:

R 18 units representing **three** (3) of the following four (4) areas of study:

a. *Historical and Philosophical Studies*
Classical Civilization 1A06
History 1C06, 1D06, 1L06
Philosophy 1B06, 1D06

b. *Languages other than English*
Chinese 1Z06
French 1A06, 1B06, 1Z06
German 1A06, 1Z06, 2Z06
Greek 1Z06, 2A03†
Hispanic Studies 1A06, 1Z06
Italian 1A06, 1Z06, 1ZZ6
Japanese 1Z06
Latin 1Z06, 2A03†
Polish 1Z06*
Russian 1Z06
Serbo-Croatian 1Z06*

c. *The Arts*
Art 1F06**
Art History 1A06
Drama 1A06
Music 1A06, 1B06, 1C02, 1CC2, 1D02, 1DD2***

d. *Literary Studies/Linguistics*
Comparative Literature 1A06
English 1D06
Linguistics 1A06

E 12 units elective of which at least 6 should be selected from courses offered by a Faculty other than Humanities. Suggested elective courses offered by the Faculty of Humanities include Humanities 1C03, 2B06, and Canadian Studies 1A06.

No Humanities I student may take more than 6 units of work in any single subject.

† Students choosing Greek or Latin 2A03 will also register for an additional 3 units of Level II Greek or Latin to be taken in Term 2.

* May not be offered every year.

** Portfolio Required: If you intend to take Art 1F06 you must present a portfolio and be interviewed by the Department of Art and Art History by the end of April. The portfolio should contain a variety of original works in different media, including works derived from both first-hand observation and the imagination. During the interview you may be asked to do some drawing as an additional means of demonstrating your skills and interests.

*** Students wishing to take Music courses other than Music 1A06 must make arrangements with the Music Department for qualifying tests.

Students admitted to **Music I** must complete 31 or 33 units of work as follows:

R Music 1B06, 1CC2, 1D02, 1DD2, 1E04 (or 1E06), 1G03. (Permission of the Department is required for Music 1E06.)

E 12 units normally representing **two** (2) of the following four (4) areas of study:

a. *Historical and Philosophical Studies*
Classical Civilization 1A06
History 1C06, 1D06, 1L06
Philosophy 1B06, 1D06

b. *Languages other than English*
   Chinese 1Z06
   French 1A06, 1B06, 1Z06
   German 1A06, 1Z06, 2Z06
   Greek 1Z06, 2A03†
   Hispanic Studies 1A06, 1Z06
   Italian 1A06, 1Z06, 1ZZ6
   Japanese 1Z06
   Latin 1Z06, 2A03†
   Polish 1Z06*
   Russian 1Z06
   Serbo-Croatian 1Z06*

c. *The Arts*
   Art 1F06**
   Art History 1A06
   Drama 1A06

d. Comparative Literature 1A06
   English 1D06
   Linguistics 1A06

† Students choosing Greek or Latin 2A03 will also register for an additional 3 units of Level II Greek or Latin to be taken in Term 2.

* May not be offered every year.

** Portfolio Required: If you intend to take Art 1F06 you must present a portfolio and be interviewed by the Department of Art and Art History by the end of April. The portfolio should contain a variety of original works in different media, including works derived from both first-hand observation and the imagination. During the interview you may be asked to do some drawing as an additional means of demonstrating your skills and interests.

B. DEGREE PROGRAMMES

Upon successful completion of Humanities I, a student may be admitted to a programme of study leading toward a Bachelor of Arts degree. (Completion of Music I may lead to a Bachelor of Music or Bachelor of Arts degree.) There are **four** ways to complete a Bachelor's degree in the Faculty of Humanities.

1. Single honours programme: *three* years of study, beyond Level I, concentrated in the work of a *single* discipline (e.g. History). After three years of Music study beyond Music I, students receive a B. Mus. degree.
2. Combined honours programme: *three* years of study, beyond Level I, concentrated in the work of *two* disciplines (e.g. French and German, English and Philosophy). In fact, a student can combine study in any two Humanities disciplines, or one Humanities discipline and a subject from another Faculty where appropriate (e.g. History and Political Science, Philosophy and Biology).
3. B.A. Programme: *two* years of study, beyond Level I, concentrated in the work of a single discipline.
4. Humanities Interdisciplinary B.A. programme: *two* years of work, beyond Humanities I, in one of six thematic modules of study representing the interplay of the insights from several related disciplines. These modules are: Ancient Studies, Canadian Studies, Comparative Literature, Contemporary Studies, Creative Arts, and Linguistics.

The content and the requirements of single honours, combined honours and other B.A. programmes are found further on in this Calendar under the title *Programmes for the B.A., B.A. (Honours) and B.Mus. Degrees.*

There are a number of Humanities courses which may be taken as electives without prerequisites. Individual course descriptions, by Department, are given under the section entitled *Courses by Department.*

Not only are students from other Faculties able to take individual courses which have an open prerequisite, but they are also able to transfer into any of the degree programmes offered by the Faculty of Humanities. For the majority of programmes in the Faculty, admission may be gained after the successful completion of any Level I programme at the university, *providing* this includes the necessary programme requisites as outlined in the admission statement for each Humanities programme as described under *Programmes for the B.A., B.A. (Honours) and B.Mus. Degrees.*

Second Language Proficiency
Students embarking on Humanities programmes should be aware that most graduate schools require, for admission, proficiency in at least one, and frequently two, languages other than English. In this Faculty, proficiency in at least one language other than English is regarded as an essential tool for students interested in English Literature, Comparative Literature, or Drama. Generally, proficiency in more than one language is a hallmark of most highly-qualified Humanities' graduates seeking the widest range of post-graduation academic and employment opportunities.

Part-Time Study
Students wishing to enter any programme offered by the Faculty of Humanities and pursue a programme on a part-time basis should consult the appropriate Departmental Counsellor(s) before making their plans.

It is anticipated that at least the following *Honours programmes* in the Humanities will be available to those part-time students who are unable to take any of their work in the regular Winter Day Session:

Art History; Drama; English; History; Philosophy.

For part-time students who are unable to attend the regular Winter Day Session, the following *B.A. programmes* are available:

Humanities Interdisciplinary B.A.; Art History; Classical Studies; Drama; English; French; History; Philosophy.

Academic Regulations

Students enrolled in Humanities programmes, in addition to meeting the General Academic Regulations of the University, shall be subject to the following Faculty Regulations and Policies.

McMaster Test of Writing Competence
Students are urged to take the McMaster Test of Writing Competence at the time of their first registration. They are expected to pass the test before proceeding beyond the first 30 units of work. Those who have failed to do so at this point will be required to consult the Associate Dean (Studies), in person, for appropriate counselling regarding remedial work. Students who have completed 60 units but have not passed the test will not be allowed to register in the Faculty of Humanities until such time as they successfully complete this test.

Registration and Course Changes
It is the responsibility of the student to ensure that the programme of work undertaken meets the requirements for the degree. In the Faculty of Humanities, students are required to preregister in March for the following Winter Session. When registering or making changes to course selection, students must seek the written approval of the appropriate Departmental Counsellor and the Dean of Studies. Dates for final registration and course changes appear in the *Sessional Dates* at the beginning of this Calendar and are rigidly adhered to.

Cross-listed Courses
Any student for whom a cross-listed course is an Area course under one of its listings must register for it under that listing. For example, Art History 2B03 is cross-listed as Classical Civilization 2B03, so students in an Art History programme wishing to register for this course must register for it under the label Art History 2B03. Such courses will then be used in calculating the student's Cumulative Area Average and possibly the Graduation Average.

Deadlines
The Faculty of Humanities will not consider applications for admission after the dates stated in this Calendar. Registrations after the stated deadlines will not be accepted unless documentation is provided showing good cause and including permission of instructors to enter classes late. Dropping and adding of courses will be permitted only within the periods stated in this Calendar.

Withdrawal
Students who wish to withdraw from the University are required to advise the Dean of Studies Office in writing. Students must surrender

their identity cards to the Dean of Studies to ensure the processing of any fee refunds. Students who fail to withdraw formally from any course(s) by the stated deadlines will remain registered whether or not they attend classes and will be assigned a grade.

Readmission

A student who *May Not Continue Without Permission* may apply for readmission. Applications for readmission in September must be made in writing, to the Associate Dean of Humanities (Studies). Deadlines for readmission applications are the same as application deadlines for admission to the University. See *Sessional Dates.*

Applications should explain the reasons for the student's inadequate performance and should include relevant documentary evidence, for example a letter from a physician outlining any medical condition that might have affected the student's academic performance or final grades. Readmission cases will be carefully screened and the evidence considered will include the student's academic performance before and after admission to McMaster, as well as the nature of the reasons cited in the application letter and the accompanying documentation.

Readmission is not guaranteed.

Students will not be considered for readmission to Humanities I from other Faculties unless their pre-University work meets the current admission requirements of the Faculty of Humanities.

The computation of Cumulative Area Averages begins anew at readmission.

Academic Regulations Pertaining to the Department of Music

The Cumulative Area Average for the Honours Music programmes and for the music portion of the Combined Honours programmes is termed the *Cumulative Music Average* and is the weighted average of grades in all Area courses attempted. To continue in an Honours Music programme, a student must maintain a CMA of at least 7.0.

The Graduation Average will be computed on a minimum of 41 units of Area courses for the B.Mus. degrees in Education and in History and Theory, and on a minimum of 40 units of Area courses for the B.Mus. degrees in Education and Performance and in History/Theory and Performance.

Normally, students with an undergraduate degree in Music will not be admitted to a B.Mus. degree programme as a second undergraduate degree.

Third Year Study Elsewhere

Students enrolled in Honours Programmes, single or combined, involving Comparative Literature, French, German, Hispanic Studies, Italian or Linguistics may apply to take part in McMaster University's Third Year Study Elsewhere programme at an appropriate university in France, Germany, Italy, Spain or the province of Quebec. Students may choose to spend one or two terms in this programme. The programmes at the host universities are specially designed to suit students at the Third Year Level, and consist principally of advanced and intensive language studies, with a high cultural and literary content.

To be eligible to take part in this programme, students are expected to complete Level II with a weighted average of at least 8.0 in their language component. No fees are payable to McMaster University for the Third Year Study Elsewhere Programme, but students must pay all travel, study and living expenses. For students who may be in need of financial assistance, O.S.A.P. (The Ontario Student Aid Programme) grants and O.S.A.P. loans are available for this programme. Furthermore, McMaster University offers some bursaries to those in need of help with travel expenses to Europe.

Students must maintain links through correspondence with their departmental advisors at McMaster University while they are engaged in study elsewhere, and all credit for work completed is confirmed after departments have reviewed the student's academic achievement following their return and entry into their final year of study. The maximum credit available in this way is fifteen units per term or thirty units for a full year of study, equivalent to Level III. In certain cases, students may be recommended for the Deans' Honour List on the basis of work undertaken in the programme.

Note: Students who are enrolled in a Combined Honours Programme involving a language and a non-language component (such as History or Political Science) can usually be granted permission to take part in Third Year Study Elsewhere for at least one term by special arrangement, provided they make early application.

Summer Immersion Programmes in French

The government-sponsored summer language bursary programme offers university students the opportunity to take French courses at a large number of accredited institutions. Students who wish to attend another university in order to participate in a language immersion programme must make a petition in writing to the Dean of Studies after being placed in the appropriate level of study. Detailed course descriptions must be submitted so that an assessment may be made and Letters of Permission may be issued on the students' behalf. Students not registered in a programme in French may take up to 12 units of credit in this manner. Students registered in a programme in French may take a maximum of six units of credit as elective work only.

Programmes for the B.A., B.A. (Honours) and B.Mus. Degrees

HUMANITIES INTERDISCIPLINARY B.A.

This programme affords students the opportunity to earn a B.A. degree encompassing formal instruction in the work of more than one Humanities department. Students choose to pursue, beyond Level I, one of six programmes of study structured around a thematic area of concentration to which the work of several departments may contribute. In selecting their Humanities I programmes students should be aware of the prerequisites for entry into particular Level II programmes.

Admission:

Completion of **Humanities I** with a University Average of at least 4.0. Any student whose Level I programme contains fewer than 12 units of Humanities work and who is interested in entering this programme should consult the Committee of Instruction for ways of meeting the admission and programme requirements. Students are strongly advised to take History 1D06 in their Level I programme.

Programme Notes:

1. Students entering this programme from another programme or from another university must complete a minimum of 30 units of work while registered in the programme.
2. In the case of a topics course, the student should ensure that the topic for the year is appropriate for his or her theme.

Area Courses:

Humanities 2B06, 3B06 plus all courses required in the selected theme of study.

Levels II and III: 60 units

R Humanities 2B06 and 3B06; 30 units of Area courses relating to the selected Theme of Study (see below).

E 18 units of electives.

Themes of Study

Within this programme, there are six themes of study: Ancient Studies, Canadian Studies, Comparative Literature, Contemporary Studies, Creative Arts, and Linguistics as set out below. Every student must concentrate his/her courses in one of these themes. Before selecting courses, students are required to arrange for counselling with the Coordinator of the Committee of Instruction for the Humanities Interdisciplinary B.A. programme. Students should note that not every course relevant to their theme may be available to them in a given year.

The courses relevant to each theme of study are as follows:

I. Ancient Studies

Students interested in this theme should include Classical Civilization 1A06 in their Level I programmes.

R History 2L06 *and* 24 units from:
Art and Archaeology
Classical Civilization 2A03, 2B03, 2C03, 3G03, 3H03, 3R03, 3S03, 3X03.
Classical World
Classical Civilization 2F03, 2U03, 2V03, 2X03, 2Z03, 3UU3, 3VV3, 3WW3.
History 2L06, 3LL3, 3MM3
Philosophy 2A06, 3E03, 3J03
Religious Studies 2K03
Judaeo-Christian Tradition
Classical Civilization 2X03
Religious Studies 2DD3, 2EE3, 2FF6, 3K03, 3M03, 3T03.
Language
One of Hebrew, Greek, Latin
Literature
Comparative Literature 2D03, 2G03
Classical Civilization 2D03, 2E03, 3C03, 3I03, 4A03.

No more than 12 units of Required work (excluding languages) may be taken from any single department's offerings.

II. Canadian Studies

Students interested in this theme are recommended to include Canadian Studies 1A06 in their Level I programmes.

R 30 units from the following:
Art History 3B03
Drama 3BB3
English 2C03, 3XX3, 3Z03
French 2F03, 2FF3, 3AA3, 3BB3, 4U03
History 2J06, 3EE3, 3KK6, 3P03, 3U03, 3V06, 4N06
Music 3T03

No more than 12 units of Required work may be taken from any single Department's offerings.

III. Comparative Literature

Students interested in this theme should include Comparative Literature 1A06 in their Level I programmes.

R 30 units of Area courses to be comprised as follows:
12 to 18 units from:
Comparative Literature 2A03, 2AA3, 3D03, 3DD3, 3QQ3, 4A03, 4B03, 4C03, 4D03;
and additional work from Comparative Literature 2B03, 2D03, 2G03, 3E03, 3I03, 3J03, 3Q03, 4D03 and 4H03 to total 30 units.

Suggested related electives:
Drama 2C03, 2E03, 2X06, 3F03, 3FF3, 3P03, 3R03, 3RR3, 3Y03, 4E03, 4F03
English 2C03, 3B03, 3JJ3, 3XX3, 3Z03
Philosophy 2H03, 4F03
Religious Studies 2DD3, 2EE3, 2E06, 2II3, 2JJ3, 2KK3, 2LL3

Students who meet the prerequisites for literature courses in languages other than English offered by the Departments of Classics, French or Modern Languages may require the approval of the Department involved.

IV. Contemporary Studies

R 30 units with at least 9 each from two of the following:
Historical and Philosophical Studies
History 2B06, 2H06, 3A03, 3B03, 3E06, 3FF3, 3GG3, 3H06, 3I03, 3II6, 3J06, 3JJ3, 3KK6, 3O03, 3P03, 3PP3, 3RR3, 3U03, 3YY3, 3W03
Philosophy 2D03, 2F03, 2G03, 2M03, 2N03, 3C03, 3D03, 3G03, 3K03, 3M03, 3N06, 3P03, 3Q03, 3R03, 4B03, 4D03, 4E03, 4F03, 4H03
Languages and Literature
Comparative Literature 4H03
English 2C03, 2F03, 3HH3, 3II3, 3JJ3, 3KK3, 3P03, 3PP3, 3X03, 3XX3, 3Z03
French 2W03★, 2WW3★, 3Z03★, 4O03★
German 2A03★, 4X03★
Hispanic Studies 2C03★, 4LL3★, 4M03★, 4Q03★, 4QQ3★, 4SS3★
Italian 3M03★, 3P03★, 4J03★
Russian 3K06, 4I03
The Arts
Art History 2P03, 3AA3, 3M03, 3R03, 3W03, 4AA3, 4M03★, 4W03
Drama 2J03, 2X06, 3BB3, 3C03, 3P03, 3R03, 3RR3, 3XX3, 3Y03, 4J03, 4K03, 4M03
Music 2BB3★, 3T03, 3U03

No more than 12 units of Required work may be taken from any single department's offerings.

★ Students should pay close attention to course prerequisites.

V. Creative Arts

Students interested in this theme should include at least one of Drama 1A06 or Music 1A06 in their Level I programmes.

R Philosophy 2H03 *and*
9 units from:
Art History 2B03, 2C03, 2G03, 2H03, 2M03, 2N03, 2O03, 2P03, 2R03, 3AA3, 3B03, 3BB3, 3C03, 3G03, 3H03, 3L03, 3M03, 3Q03, 3S03, 3W03, 3X03, 4C03, 4F03, 4M03, 4Q03, 4R03, 4V03, 4W03, 4X03.
9 units from:
Drama 2A06, 2B06, 2C03, 2E03, 2F03, 2FF3, 2J03, 2X06, 3A06, 3B03, 3BB3, 3C03, 3D03, 3DD3, 3F03, 3FF3, 3K06, 3P03, 3PP3, 3Q03, 3R03, 3RR3, 3XX3, 3Y03, 4A06, 4B03, 4D03, 4E03, 4F03, 4J03, 4K03, 4M03, English 3FF3
9 units from:
Music 1B06, 2A06, 2B03, 2BB3, 3A03, 3AA3, 3B03, 3BB3, 3T03, 3U03, 4B03, 4BB3, 4I03; and additional courses available (subject to successful completion of qualifying tests) from: Music 1CC2, 1D02, 1DD2, 2CC3, 2D02, 2DD2, 2H04

VI. Linguistics

Students interested in this theme should include Linguistic 1A06 and 6 units of a language other than English in their Level I programmes.

R 12 units of one language other than English (the same language taken in Level I), and
12 units from:
Linguistics 2A06, 2L03, 2M03, 2Q03, 2T03, 3A06, 3I03, 3M03, 3P03, 3Y03, 4A06, 4K03
6 units from:
English 2V06
French 2H03, 3B03, 3E03, 3G03, 3I03, 4C03, 4E03, 4X03
Hispanic Studies 3A03
Italian 4L04
Russian 4J03, 4K03
Sanskrit 3A06

Department of Art and Art History

HONOURS ART

Admission:

Completion of **any Level I** programme with a weighted average of at least 7.0 in Art History 1A06 and Art 1F06, including a grade of at least B– in Art 1F06.

Programme Notes:

1. Students in Honours Art must complete Art 2A04, 2B04, 2C03, 2F04 before registering in Level III or IV Art courses.
2. Level II Art History courses are grouped into the following Fields:
   I *Ancient and Medieval*: Art History 2B03, 2C03, 2G03
   II *Renaissance and Baroque*: Art History 2M03, 2N03, 2R03
   III *Modern*: Art History 2O03, 2P03, 2X06

Area Courses:

All Level II, III and IV Art courses, excluding Art 2E03 and 2G03; all Level III and IV Art History courses.

Levels II, III and IV: 90 units

R 48 units of Art including Art 2A04, 2B04, 2C03, 2F04; 3C03 or 3D03; 3G06, and 24 units of Level III or IV Art courses, including 4B12 or 4C06; 18 units of Art History, including at least 3 units of Level II from each Field and at least 6 units from Levels III or IV.

E 24 units, 12 of which may be from Art and Art History.

COMBINED HONOURS IN ART AND ANOTHER SUBJECT

Admission:
Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level 1 work, including a grade of at least B– in Art 1F06.

Area Courses:
All Level II, III and IV Art courses, excluding Art 2G03.

Levels II, III and IV: 90 units minimum

R 42 units of Art including Art 2A04, 2B04, 2C03, 2F04; 3C03 or 3D03; 3G06, and 18 units of Level III or IV Art, including 4B12 or 4C06.

E To the combined total of a minimum of 78 units of Area work beyond Level I, the student must add elective work to make up an overall total of at least 90 units.

HONOURS ART HISTORY

Admission:
Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work including a grade of at least B– in Art History 1A06.

Programme Note:
Level II Art History courses are grouped into the following Fields:
I *Ancient and Medieval*: Art History 2B03, 2C03, 2G03
II *Renaissance and Baroque*: Art History 2M03, 2N03, 2R03
III *Modern*: Art History 2O03, 2P03, 2X06

Area Courses:
All Level II, III and IV Art History courses.

Levels II, III and IV: 90 units

R 54 units of Art History, including 18 units of Level II (6 units from each Field), and 36 units of Levels III and IV Art History including 6 units of seminar courses.

12 units Humanities, excluding Art History, or other non-Art History offerings, approved by the Chairman of the Department and the Associate Dean of Humanities.

E 24 units, 12 of which may be Art History.

COMBINED HONOURS IN ART HISTORY AND ANOTHER SUBJECT

Admission:
Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B– in Art History 1A06.

Programme Note:
Level II Art History courses are grouped into the following Fields:
I *Ancient and Medieval*: Art History 2B03, 2C03, 2G03
II *Renaissance and Baroque*: Art History 2M03, 2N03, 2R03
III *Modern*: Art History 2O03, 2P03, 2X06

Area Courses:
All Level II, III and IV Art History courses

Levels II, III and IV: 90 units minimum

R 36 units of Art History including 12 units of Level II (at least 3 units from each Field), and 24 units of Levels III or IV (at least one seminar course and 3 additional units from Level IV).

E To the combined total of a minimum of 72 units of Area work beyond Level I, the student must add elective work to make up an overall total of at least 90 units.

B.A. IN ART HISTORY

Admission:
Completion of **any Level I** programme with a grade of at least C– in Art History 1A06.

Progamme Note:
Level II Art History courses are grouped into the following Fields:
I *Ancient and Medieval*: Art History 2B03, 2C03
II *Renaissance and Baroque*: Art History 2M03, 2N03, 2R03
III *Modern*: Art History 2O03, 2P03, 2X06

Area Courses:
All Level II, III and IV Art History courses.

Levels II and III: 60 units

R 30 units of Art History including 18 units of Level II (6 units from each Field), and 12 units from Levels III or IV; 6 units Humanities (excluding Art History).

E 24 units, 12 of which may be Art History.

B.A. IN ART AND ART HISTORY

Available only to students who entered this programme **before September 1988.**

Area Courses:
All Level II, III and IV Art courses excluding Art 2E03 and 2G03; all Level II, III and IV Art History courses.

Programme Note:
Graduates of this programme who have taken *no* Art courses beyond Level I will receive a B.A. in Art History and, in Level III, will be registered in the Art History programme *only*.

Levels II and III: 60 units

R 30 units of Art and/or Art History beyond Level I including at least 15 units of Art History; at least 9 units of Level III or IV Area courses; 6 units of Humanities.

E 24 units elective, of which 12 may be Art and/or Art History.

Canadian Studies

The B. A. Programmes in Canadian Studies have been suspended. Courses with a focus on Canadian Studies are available. Students with an interest in this area should consult the section *Courses Listing, Canadian Studies* in this Calendar. A Canadian Studies Theme of Study also exists within the Humanities Interdisciplinary B.A., as described in the section *Programmes for the B.A., B.A. (Honours) and B.Mus. Degree, Humanities Interdisciplinary B.A.*

Department of Classics

Students who entered any programme in the Department of Classics on or before September 1988 must consult the Academic Counsellor for Classics to discuss ways of meeting their programme requirements.

Department Notes:

1. The Department of Classics offers two types of programmes: Classical Studies and Classics. Classical Studies programmes are studies of sub-fields of Greek and Roman culture in various combinations individually arranged to meet the student's interests and needs. Classics programmes are primarily studies of Greek and Latin language and literature with additional study of other sub-fields of Greek and Roman culture.
2. Courses in the five sub-fields listed below are available to students in the Classical Studies and Classics programmmes.
    - a. *Classical Archaeology and Art History*
      Classical Civilization 2A03, 2B03, 2C03, 2F03, 3G03, 3H03, 3R03, 3S03, 3X03, 4YY6, 4Y03
    - b. *Ancient History and Society*
      Classical Civilization 2G06, 2U03, 2V03, 2X03, 2Z03, 3LL3, 3MM3, 3UU3, 3VV3, 3WW3, 4D06, 4I06, 4LL6, 4ZZ6, 4Z03
    - c. *Classical Literature in Translation*
      Classical Civilization 2D03, 2E03, 3C03, 3I03, 4A03
    - d. *Greek Studies*
      Greek 1Z06, 2A03, 2F03, 2G03, 2R03, 3AA3, 3BB3, 3R02, 4AA3, 4K03, 4R02; Classical Civilization 4XX6, 4X03
    - e. *Latin Studies*
      Latin 1Z06, 2A03, 2F03, 2G03, 2R03, 3AA3, 3BB3, 3R02, 4AA3, 4K03, 4KK3, 4R02; Classical Civilization 4XX6, 4X03

3. Courses in Ancient Philosophy and Ancient Religious studies offered by other departments are also available to students in the Classical Studies and Classics programmes.

HONOURS CLASSICAL STUDIES

Admission:

Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B− in one of Classical Civilization 1A06, Greek 1Z06, or Latin 1Z06. (Students with Grade 13 or OAC Greek may substitute Greek 2A03 and 3 additional units of Level II Greek; students with Grade 13 or OAC Latin may substitute Latin 2A03 and 3 additional units of Level II Latin.)

Programme Notes:

1. Students entering the programme with 6 units of Greek or Latin who have not also completed Classical Civilization 1A06 are strongly encouraged to include Classical Civilization 2G06 in their Level II programme.
2. Students intending to do graduate work in the field of Classical Studies should note that most universities offering such programmes require some undergraduate work in Greek and Latin for admission. These students are strongly encouraged to include Greek and Latin courses as early as possible in their programme.
3. All Level II Classical Civilization, Greek, and Latin courses will be included in calculating the Graduation Average.

Area Courses:

All Level II, III and IV Classical Civilization, Greek and Latin courses; Greek 1Z06 and Latin 1Z06, if not completed in the Level I programme.

Levels II, III and IV: 90 units minimum

R 54 units as follows: 48 units of Classical Civilization, Greek and Latin including at least 24 units of Level III and IV courses; one of Classical Civilization 4XX6, 4YY6, 4ZZ6 *or* one of Classical Civilization 4X03, 4Y03, 4Z03 and 3 additional units of Level III or IV Area courses.

12 units Humanities, excluding Classical Civilization (Greek and Latin may be included), or other non-Classical Studies courses approved by the Chairman of the Department and the Associate Dean of Humanities.

E 24 units, 12 of which may be from Classical Civilization.

COMBINED HONOURS IN CLASSICAL STUDIES AND ANOTHER SUBJECT

Admission:

Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B− in one of Classical Civilization 1A06, Greek 1Z06, or Latin 1Z06. (Students with Grade 13 or OAC Greek may substitute Greek 2A03 and 3 additional units of Level II Greek; students with Grade 13 or OAC Latin may substitute Latin 2A03 and 3 additional units of Level II Latin.)

Programme Notes:

1. Students entering the programme with 6 units of Greek or Latin who have not also completed Classical Civilization 1A06 are strongly encouraged to include Classical Civilization 2G06 in their Level II programme.
2. Students intending to do graduate work in the field of Classical Studies should note that most universities offering such programmes require some undergraduate work in Greek and Latin for admission. These students are strongly encouraged to include Greek and Latin courses as early as possible in their programme.
3. All Level II Classical Civilization, Greek, and Latin courses will be included in calculating the Graduation Average.

Area Courses:

All Level II, III and IV Classical Civilization, Greek and Latin courses; Greek 1Z06 and Latin 1Z06, if not completed in the Level I programme.

Levels II, III and IV: 90 units minimum

R 36 units as follows: 30 units of Classical Civilization, Greek and Latin including at least 12 units of Level III and IV courses; one of Classical Civilization 4XX6, 4YY6, 4ZZ6 or one of Classical Civilization 4X03, 4Y03, 4Z03 and 3 additional units of Level III or IV Area courses.

E To the minimum total of 72 units of Area work in the two components of the Combined Honours programme, students must add elective work to make a mimumum overall total of 90 units beyond Level I.

B.A. IN CLASSICAL STUDIES

Admission:

Completion of **any Level I** programme with a grade of at least C− in one of Classical Civilization 1A06, Greek 1Z06, or Latin 1Z06. (Students with Grade 13 or OAC Greek may substitute Greek 2A03 and 3 additional units of Level II Greek; students with Grade 13 or OAC Latin may substitute Latin 2A03 and 3 additional units of Level II Latin.)

Programme Notes:

1. Students entering the programme with 6 units of Greek or Latin who have not also completed Classical Civilization 1A06 are strongly encouraged to include Classical Civilization 2G06 in their Level II programme.
2. Students are encouraged to include at least 6 units of Greek or Latin in their programme. Greek 1Z06 and Latin 1Z06, if not completed in the Level I programme, may be taken as Faculty of Humanities required courses or as elective courses.
3. Students in the B.A. programme in Classical Studies who achieve a weighted average of at least 7.0 in 12 units of Level II Area Courses may be admitted to Honours Classical Studies in Level III.

Area Courses:

All Level II, III, and IV Classical Civilization, Greek, and Latin courses.

Levels II and III: 60 units

R 24 units of Classical Civilization, Greek and Latin, including at least 9 units of Level III and IV courses.

12 units from the Faculty of Humanities.

E 24 units, 12 of which may be from Classical Civilization.

HONOURS CLASSICS

Admission:

Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B− in Greek 1Z06 *and/or* a grade of at least B− in Latin 1Z06. (Students with Grade 13 or OAC Greek may substitute Greek 2A03 and 3 additional units of Level II Greek; students with Grade 13 or OAC Latin may substitute Latin 2A03 and 3 additional units of Level II Latin.) Students are encouraged to include Classical Civilization 1A06 in their Level I programme.

Programme Notes:

1. Students will choose one of the following options:
   a. *for students entering with both Greek and Latin*
      Greek 2A03, 2F03, 2G03, 2R03, 3AA3, 3BB3, 3R02, 4AA3, 4R02; Latin 2A03, 2F03, 2G03, 2R03, 3AA3, 3BB3, 3R02, 4AA3, 4R02
   b. *for students entering with Greek only*
      Greek 2A03, 2F03, 2G03, 2R03, 3AA3, 3BB3, 3R02, 4AA3, 4R02; Latin 1Z06, 2A03, 2F03, 2G03, 2R03, 3AA3 or 4AA3, 3R02 or 4R02
   c. *for students entering with Latin only*
      Latin 2A03, 2F03, 2G03, 2R03, 3AA3, 3BB3, 3R02, 4AA3, 4R02; Greek 1Z06, 2A03, 2F03, 2G03, 2R03, 3AA3 or 4AA3, 3R02 or 4R02
2. Greek 2F03 and 2G03 and Latin 2F03 and 2G03 will be included in calculating the Graduation Average.

Area Courses:

All Level II, III and IV Greek, Latin and Classical Civilization courses.

Levels II, III and IV: 90-92 units minimum

R one of options *a.-c.* listed above under *Programme Notes*; 18 additional units of Area courses including Classical Civilization 2G06; Classical Civilization 4XX6 or Classical Civilization 4X03 and 3 additional units of Level III or IV Area courses.

E 18 units, 9 of which may be from Greek and Latin.

COMBINED HONOURS IN LATIN AND ANOTHER SUBJECT

Students who entered this programme on or **before September 1988** must consult the Academic Counsellor for the Department of Classics to discuss ways of meeting their programme requirements.

B.A. IN LATIN

Students who entered this programme on or **before September 1988** must consult the Academic Counsellor for the Department of Classics to discuss ways of meeting their programme requirements.

Drama

HONOURS ARTS AND SCIENCE AND DRAMA (B.Arts Sc.)

(See *Arts and Science Programme*).

HONOURS DRAMA

Admission:

Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B− in Drama 1A06.

Programme Notes:

1. Courses are grouped into four major fields: theatre crafts, film studies, theatre history, dramatic literature and theory. While students are encouraged to pursue a broadly-based programme of study, a limited amount of specialization is possible through a careful selection of courses.

   Students wishing to graduate in Drama programmes must complete a minimum of three units of work from at least 3 of the 4 Fields of Study indicated below. (Courses which appear in two Fields can only satisfy one Field requirement.)

   I *Theatre Crafts*
   Drama 2A06, 3A06, 3D03, 4A06

   II *Film Studies*
   Drama 2X06, 3R03, 3RR3, 3Y03, 4H03, 4K03

   III *Theatre History*
   Drama 2C03, 2E03, 2F03, 3F03, 3FF3, 3M03, 3MM3, 3PP3, 4D03, 4DD3, 4F03, 4M03

   IV *Dramatic Literature and Theory*
   Drama 2B06, 2E03, 3BB3, 3C03, 3CC3, 3DD3, 3K06, 3P03, 3PP3, 3Q03, 4D03, 4DD3, 4E03
2. Students registered in Honours Drama are strongly urged to complete 6 units of non-introductory work in a language other than English.
3. Students who meet the prerequisites for courses in drama in languages other than English, offered by the Departments of Classics, French or Modern Languages, may take up to 6 units of such courses as a part of their Drama R-group, with the approval of the Chairman of the Committee.
4. **Practicum Courses:** Practicum courses are open only to students registered in Drama or Physical Education programmes. Each practicum course carries one unit of academic credit, and requires twenty-four hours of instruction over a six-week or a twelve-week period. Students registered in an Honours or a Combined Honours programme in Drama may include up to six units of practicum courses in their programmes; students registered in a three-level programme in Drama may take up to three units of practicum courses. No student may register in more than two practicum courses in a single academic session. Practicum courses will be classified as "Area" courses, but must be taken as work over and above the total number of units required for the degree programme. Details regarding the following practicum courses can be obtained from the Drama Chairman.

   2D01/Dance in Musical Theatre (Same as PR 17)
   2DD1/Historical Dance and Movement (Same as PR 18)
   2EE1/Mind-Body Integration (Same as PR 30)
   2G01/Modern Dance I (Same as PR 21)
   3G01/Mime (Same as PR 27)
   3GG1/Jazz Dance I (Same as PR 25)
   3H01/Dance Exercise (Same as PR 28)
   3HH1/Social Dance (Same as PR 22)
   3I01/Folk Dance (Same as PR 20)

Area Courses:

All Level II, III and IV Drama courses.

Levels II, III and IV: 90 units

R 18 units of Level II Drama; 36 units of Level III/IV Drama, which must include at least one Level IV course.
12 units Humanities, excluding Drama, or other non-Drama courses approved by the Drama Chairman and the Associate Dean of Humanities.

E 24 units, 12 of which may be from Drama.

COMBINED HONOURS IN DRAMA AND ANOTHER SUBJECT

Admission:

Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B− in Drama 1A06.

Programme Notes:

1. Courses are grouped into four major fields: theatre crafts, film studies, theatre history, dramatic literature and theory. While students are encouraged to pursue a broadly-based programme of study, a limited amount of specialization is possible through a careful selection of courses.

   Students wishing to graduate in Drama programmes must complete a minimum of three units of work from at least 3 of the 4 Fields of Study indicated below. (Courses which appear in two Fields can only satisfy one Field requirement.)

   I *Theatre Crafts*
   Drama 2A06, 3A06, 3D03, 4A06

   II *Film Studies*
   Drama 2X06, 3R03, 3RR3, 3Y03, 4H03, 4K03

   III *Theatre History*
   Drama 2C03, 2E03, 2F03, 3F03, 3FF3, 3M03, 3MM3, 3PP3, 4D03, 4DD3, 4F03, 4M03

   IV *Dramatic Literature and Theory*
   Drama 2B06, 2E03, 3BB3, 3C03, 3CC3, 3DD3, 3K06, 3P03, 3PP3, 3Q03, 4D03, 4DD3, 4E03
2. Students are strongly urged to complete a language other than English (at least high school Grade 13 or OAC or a University 1Z06 course).
3. Students who meet the prerequisites for courses in drama in languages other than English, offered by the Departments of Classics, French, or Modern Languages, may take up to 6 units of such courses, as a part of their Drama R-group, with the approval of the Chairman of the Committee.
4. **Practicum Courses:** Practicum courses are open only to students registered in Drama or Physical Education programmes. Each practicum course carries one unit of academic credit, and requires twenty-four hours of instruction over a six-week or a twelve-week period. Students registered in an Honours or a Combined Honours programme in Drama may include up to six units of practicum courses in their programmes; students registered in a three-level programme in Drama may take up to three units of practicum courses. No student may register in more than two practicum courses in a single academic session. Practicum courses will be classified as "Area" courses, but must be taken as work over and above the total number of units required for the degree programme. Details regarding the following practicum courses can be obtained from the Drama Chairman.

   2D01/Dance in Musical Theatre (Same as PR 17)
   2DD1/Historical Dance and Movement (Same as PR 18)
   2EE1/Mind-Body Integration (Same as PR 30)
   2G01/Modern Dance I (Same as PR 21)
   3G01/Mime (Same as PR 27)
   3GG1/Jazz Dance I (Same as PR 25)
   3H01/Dance Exercise (Same as PR 28)
   3HH1/Social Dance (Same as PR 22)
   3I01/Folk Dance (Same as PR 20)

Area Courses:

All Level II, III and IV Drama courses.

Levels II, III and IV: 90 units minimum

R 12 units of Level II Drama; 24 units of Level III/IV Drama, which must include at least one Level IV Drama course.

E To the minimum total of 72 units of Area work in the two components of the Combined Honours programme, students must add elective work to make a minimum overall total of 90 units beyond Level I.

B.A. IN DRAMA

Admission:
Completion of **any Level I** programme including 12 units from the Faculty of Humanities with a grade of at least C– in Drama 1A06.

Programme Notes:

1. Courses are grouped into four major fields: theatre crafts, film studies, theatre history, dramatic literature and theory. While students are encouraged to pursue a broadly-based programme of study, a limited amount of specialization is possible through a careful selection of courses.

   Students wishing to graduate in Drama programmes must complete a minimum of three units of work from at least 3 of the 4 Fields of Study indicated below. (Courses which appear in two Fields can only satisfy one Field requirement.)

   I *Theatre Crafts*
   Drama 2A06, 3A06, 3D03, 4A06

   II *Film Studies*
   Drama 2X06, 3R03, 3RR3, 3Y03, 4H03, 4K03

   III *Theatre History*
   Drama 2C03, 2E03, 2F03, 3F03, 3FF3, 3M03, 3MM3, 3PP3, 4D03, 4DD3, 4F03, 4M03

   IV *Dramatic Literature and Theory*
   Drama 2B06, 2E03, 3BB3, 3C03, 3CC3, 3DD3, 3K06, 3P03, 3PP3, 3Q03, 4D03, 4DD3, 4E03

2. **Practicum Courses:** Practicum courses are open only to students registered in Drama or Physical Education programmes. Each practicum course carries one unit of academic credit, and requires twenty-four hours of instruction over a six-week or a twelve-week period. Students registered in an Honours or a Combined Honours programme in Drama may include up to six units of practicum courses in their programmes; students registered in a three-level programme in Drama may take up to three units of practicum courses. No student may register in more than two practicum courses in a single academic session. Practicum courses will be classified as "Area" courses, but must be taken as work over and above the total number of units required for the degree programme. Details regarding the following practicum courses can be obtained from the Drama Chairman.

   2D01/Dance in Musical Theatre (Same as PR 17)
   2DD1/Historical Dance and Movement (Same as PR 18)
   2EE1/Mind-Body Integration (Same as PR 30)
   2G01/Modern Dance I (Same as PR 21)
   3G01/Mime (Same as PR 27)
   3GG1/Jazz Dance I (Same as PR 25)
   3H01/Dance Exercise (Same as PR 28)
   3HH1/Social Dance (Same as PR 22)
   3I01/Folk Dance (Same as PR 20)

Area Courses:
All Level II, III and IV Drama courses.

Levels II and III: 60 units

R 12 units Level II Drama; 12 units Level III/IV Drama; 12 units from the Faculty of Humanities.

E 24 units, 12 of which may be Drama.

Department of English

HONOURS ARTS AND SCIENCE AND ENGLISH (B.Arts Sc.)

(See Arts and Science Programme).

HONOURS ENGLISH

Admission:
Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B– in English 1A06, 1B06 or 1D06.

Programme Notes:

1. Students wishing to graduate in Honours English should plan their programmes in consultation with the Departmental Counsellor, so as to cover as many of the following courses as possible. A minimum of 6 units of work from each of the six indicated fields must be taken.

   I *Medieval*
   English 3D03, 3DD3, 4E06

   II *Renaissance*
   English 3I03, 3K06, 3T03

   III *17th and 18th Centuries*
   English 3V06, 4B06

   IV *19th and 20th Centuries*
   English 2I06, 4L03, 4M03

   V *North American*
   English 2G06, 2H06

   VI *Studies in Language, Criticism and Genre*
   English 2B06, 2V06, 3Q03, 3QQ3, 4N06

2. Students wishing to graduate in Honours English must have successfully completed 6 units of non-introductory work in a language other than English. The Department strongly advises students to fulfill this requirement before Level III.

Area Courses:
English 2B06, 2G06, 2H06, 2I06, 2V06, 3D03, 3DD3, 3I03, 3K06, 3Q03, 3QQ3, 3T03, 3V06, 4B06, 4E06, 4L03, 4M03, 4N06.

Levels II, III and IV: 90 units

R 54 units of English Area courses, including 18 units of Level II, 18 units of Level III and 18 units of Level IV;

12 units Humanities (excluding English), or other non-English courses approved by the Chairman of the Department and the Associate Dean of Humanities.

E 24 units, 12 of which may be from English.

COMBINED HONOURS IN ENGLISH AND ANOTHER SUBJECT

Admission:
Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B– in English 1A06, 1B06 or 1D06.

Programme Notes:

1. Students wishing to graduate in Combined Honours English and another subject should plan their programmes in consultation with the Departmental Counsellor, so as to cover as many of the following courses as possible. A minimum of 6 units of work from at least five of the six indicated fields must be taken.

   I *Medieval*
   English 3D03, 3DD3, 4E06

   II *Renaissance*
   English 3I03, 3K06, 3T03

   III *17th and 18th Centuries*
   English 3V06, 4B06

   IV *19th and 20th Centuries*
   English 2I06, 4L03, 4M03

   V *North American*
   English 2G06, 2H06

   VI *Studies in Language, Criticism and Genre*
   English 2B06, 2V06, 3Q03, 3QQ3, 4N06

2. Students wishing to graduate in Honours English combined with another subject other than a language, must have successfully completed 6 units of a language other than English or of other courses approved for this purpose by the Department of English: Linguistics 1A06, 2L03, 2M03, 3I03, 3M03, English 2VV6. The Department strongly advises students to fulfill this requirement before Level III.
   Note: Students who wish to take English 2V06 in fulfillment of the language requirement *must register in the course as English 2VV6*, in which case it may not be used to fulfill the English Area requirements.

Area Courses:
English 2B06, 2G06, 2H06, 2I06, 2V06, 3D03, 3DD3, 3I03, 3K06, 3Q03, 3QQ3, 3T03, 3V06, 4B06, 4E06, 4L03, 4M03, 4N06.

The **English component** of a Combined Honours programme will be as follows:

Levels II, III and IV: 90 units minimum

R 36 units of English Area courses, including 12 units of Level II, 12 units of Level III and 12 units of Level IV.

E To the minimum total of 72 units of Area work in the two components of the Combined Honours programme, students must add elective work to make a minimum overall total of 90 units beyond Level I.

B.A. IN ENGLISH

Admission:

Completion of **any Level I** programme with a grade of at least C− in English 1A06, 1B06 or 1D06.

Programme Notes:

1. Students wishing to graduate in the B.A. programme in English should plan their programmes in consultation with the Departmental Counsellor, so as to take a minimum of 6 units of work from at least five of the six fields indicated below.
   - I *Medieval*
     English 3D03, 3DD3, 4E06
   - II *Renaissance*
     English 3I03, 3K06, 3T03
   - III *17th and 18th Centuries*
     English 3V06, 4B06
   - IV *19th and 20th Centuries*
     English 2I06, 4L03, 4M03
   - V *North American*
     English 2G06, 2H06
   - VI *Studies in Language, Criticism and Genre*
     English 2B06, 2V06, 3Q03, 3QQ3, 4N06
2. Students wishing to graduate in the B.A. programme in English must have successfully completed 6 units of a language other than English or of other courses approved for this purpose by the Department of English: Linguistics 1A06, 2L03, 2M03, 3I03, 3M03, English 2VV6. The Department strongly advises students to fulfill this requirement before Level III.
   Note: Students who wish to take English 2V06 in fulfillment of the language requirement *must register in the course as English 2VV6*, in which case it may not be used to fulfill the English Area requirements.

Area Courses:

English 2B06, 2G06, 2H06, 2I06, 2V06, 3D03, 3DD3, 3I03, 3K06, 3Q03, 3QQ3, 3T03, 3V06, 4B06, 4E06, 4L03, 4M03, 4N06.

Levels II and III: 60 units

R 12 units from English 2B06, 2G06, 2H06, 2I06, 2V06; 18 units from English 3D03, 3DD3, 3I03, 3K06, 3Q03, 3QQ3, 3T03, 3V06, 4B06, 4E06, 4L03, 4M03, 4N06; 6 units Humanities.

E 24 units, 12 of which may be from English.

Department of French

HONOURS ARTS AND SCIENCE AND FRENCH (B.Arts Sc.)

(See Arts and Science Programme)

HONOURS FRENCH

Programme A: Language and Literature

Admission:

Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B− in French 1A06. (French 1B06 with a grade of at least B may be substituted for French 1A06 with permission of the Department.)

Programme Note:

1. Upon completion of 60 units of work (including 18 units of required Level II French Area courses), and with the approval of the Department of French and the Associate Dean of Humanities (Studies), Level III of Honours French may be replaced by courses of study at a French-language university.

Area Courses:

All Level II, III and IV courses in French, except 3Y03.

Levels II, III and IV: 90 units

R 15 units of French Language Practice courses, including French 2A03, 3C03, 4A03; 24 units of French/Francophone Literature and Civilization courses, including one of French 2J03, 2JJ3, one of French 2W03, 2WW3, one of French 3K03, 3KK3, one of French 3Q03, 3QQ3, 9 units of Level IV French courses; 15 additional units of French (The overall total must include a minimum of 36 units of Level III and IV French Area Courses.)

12 units Humanities, excluding French, or other non-French courses approved by the Chairman of the Department and the Associate Dean of Humanities.

E 24 units elective, 12 of which may be French.

Programme B: Language and Linguistics

Admission:

Completion of **any Level I** programme (including a Level I English course) with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B− in French 1A06. (French 1B06 with a grade of at least B may be substituted for French 1A06 with permission of the Department.) Students who are interested in entering this programme are advised to take Linguistics 1A06; those who lack a Level I English course should consult the Department for ways of meeting the programme requirements.

Programme Notes:

1. French 2G03 and 2H03 will be included in calculating the Graduation Average.
2. Upon completion of 60 units of work (including 18 units of required Level II French Area courses), and with the approval of the Department of French and the Associate Dean of Humanities (Studies), Level III of Honours French may be replaced by courses of study at a French-language university.

Area Courses:

All Level II, III and IV courses in French, except French 3Y03.

Levels II, III and IV: 90 units

R 51 units of French as follows:
French 2A03, 2H03, 3C03, 4A03;
9 units from French 2G03, 3CC3, 4B03, 4BB3;
3 units from French 2J03, 2JJ3;
3 units from French 2W03, 2WW3;
9 units of Level III or IV French/Francophone Literature or Civilization courses;
15 units from French 3B03, 3E03, 3G03, 3I03, 3R03, 4C03, 4E03, 4X03, 4Z03

12 units of English and/or Linguistics beyond Level I (to be determined in consultation with the Departmental Counsellor).

E 27 units, 12 of which may be French.

COMBINED HONOURS IN FRENCH AND ANOTHER SUBJECT

Admission:

Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B− in French 1A06. (French 1B06 with a grade of at least B may be substituted for French 1A06 with permission of the Department.)

Programme Note:

Upon completion of 60 units of work (including at least 12 units of required Level II French Area courses), and with the approval of the Department of French and the Associate Dean of Humanities (Studies), up to 15 units of Level III French may be replaced by courses of study at a French-language university.

Area Courses:

The **French component** of a Combined Honours Programme will be as follows: all Level II, III and IV courses in French, except 3Y03.

Levels II, III and IV: 90 units minimum

R 12 units of French Language Practice courses, including French 2A03, 3C03, 4A03; 18 units of French/Francophone Literature courses, including one of French 2J03, 2JJ3, one of French 2W03, 2WW3, one of French 3K03, 3KK3, one of French 3Q03, 3QQ3, 6 units of Level IV French courses; 6 additional units of French. (The overall total must include a minimum of 24 units of Level III and IV French Area courses.)

E To the minimum total of 72 units of Area work in the two components of the Combined Honours programme, students must add elective work to make a minimum overall total of 90 units beyond Level I.

B.A. IN FRENCH (September 1989)

The following requirements apply to students who enter this programme **from September 1989**. (See below for the requirements for students who entered this programme on or before September 1988.)

Admission:
Completion of **any Level I** programme with a grade of at least C− in French 1A06. (French 1B06, with a grade of at least C, may be substituted for French 1A06 with permission of the Department.)

Area Courses:
All Level II, III and IV French courses, except 3Y03.

Levels II and III: 60 units

R 33 units of French as follows: French 2A03, 3C03 and two from French 2C03, 2G03, 3CC3 and 3F03; 9 units of French/Francophone Literature and Civilization courses, including one of French 2J03, 2JJ3, one of French 2W03, 2WW3, one of French 3K03, 3KK3, 3Q03, 3QQ3, 12 additional units of French; 3 units from the Faculty of Humanities which may be French.

E 24 units elective, 12 of which may be from French.

B.A. IN FRENCH (prior to September 1989)

The following requirements apply only to students who entered this programme **before September, 1989**. (See above for the requirements for students who entered this programme from September 1989.)

Area Courses:
All Level II, III and IV French courses, except 3Y03.

Levels II and III: 60 units

R 9 units of French Language Practice courses, including French 2A03 and 3C03; 9 units of French/Francophone Literature and Civilization courses, including one of French 2J03, 2JJ3, one of French 2W03, 2WW3, one of French 3K03, 3KK3, 3Q03, 3QQ3, 9 additional units of French; 9 units from the Faculty of Humanities.

E 24 units elective, 12 of which may be from French.

Department of History

HONOURS ARTS AND SCIENCE AND HISTORY (B.Arts Sc.)

(See *Arts and Science Programme*)

HONOURS HISTORY

Admission:
Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work acceptable to the Department, including a grade of at least B− in any Level I History course.

Programme Notes:

1. In selecting courses, students must ensure that they take at least 6 units in each of three fields of History. For this purpose the Department has established the following six fields: European, Ancient, Asian, Canadian, British and the Americas (excluding Canada). This requirement must be satisfied by the end of Level III. All Level I, II and III History courses may be used towards this requirement.
2. No Level IV seminar may be taken before completion of 12 units of History beyond Level I; normally no more than 12 units of Level IV History seminars may be taken in any session (a C.A.A. of at least 8.0 is required before exceptions will be considered.)

Area Courses:
All Level II, III and IV History courses.

Levels II, III and IV: 90 units

R History 2J06 and 12 additional units of Level II History; 18 units of Level III History and 18 units of Level IV History.

12 units Humanities, excluding History, or other non-History courses approved by the Chairman of the Department and the Associate Dean of Humanities.

E 24 units, 12 of which may be from History courses approved by the Department.

COMBINED HONOURS IN HISTORY AND ANOTHER SUBJECT

Admission:
Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B− in any Level I History course.

Programme Notes:

1. In selecting courses, students must ensure that they take at least 6 units in each of three fields of History. For this purpose the Department has established the following six fields: European, Ancient, Asian, Canadian, British and the Americas (excluding Canada). This requirement must be satisfied by the end of Level III. All Level I, II, and III History courses may be used towards this requirement.
2. No Level IV seminar may be taken before completion of 12 units of History beyond Level I.

Area Courses:
All Level II, III and IV History courses.

Levels II, III and IV: 90 units minimum

R 12 units of Level II History; 12 units of Level III History; 12 units of Level IV History.

E To the minimum total of 72 units of Area work in the two components of the Combined Honours programme, students must add elective work to make a minimum overall total of 90 units beyond the Level I programme.

B.A. IN HISTORY

Admission:
Completion of **any Level I** programme with a weighted average of at least 4.0 in 12 units of Level I work, including a grade of at least C− in any Level I History course.

Programme Notes:

1. History students who achieve a Cumulative Area Average of at least 7.0 in their Level II History courses in the B.A. programme may be admitted to Honours History in Level III.
2. In selecting courses, students must ensure that they take at least 6 units in each of three of the following six fields of History: European, Ancient, Asian, Canadian, British, and the Americas (excluding Canada). All Level I, II, and III History courses may be used towards this requirement.
3. With the approval of the Departmental Counsellor, 6 units of Level III History may be replaced by Level IV History if the student has completed at least 12 units of History beyond Level I and has a minimum CAA of 7.0.

Area Courses:
All Level II, III and IV History courses.

Levels II and III: 60 units

R History 2J06 and 6 additional units of Level II History; 12 units of Level III History; 12 units from the Faculty of Humanities, excluding History.

E 24 units elective, 12 of which may be History courses above Level I.

Department of Modern Languages

The Department of Modern Languages offers single Honours programmes in Comparative Literature and Modern Languages and Linguistics. The Department also offers Combined Honours programmes in Comparative Literature, German, Hispanic Studies, Italian and Russian.

HONOURS COMPARATIVE LITERATURE

The three programme options in Comparative Literature provide students with a study of specially designed courses in Comparative Literature taught in English in conjunction with the study of one or two national literatures normally taught in the original language.

Programme A (With *One* Language Other Than English)

Admission:

Completion of **any Level I** programme, including Comparative Literature 1A06 with a grade of at least B–, and 6 units from French 1A06, 1B06, German 1A06, 1Z06, Greek 1Z06, Italian 1A06, 1ZZ6, 1Z06, Latin 1Z06, Russian 1Z06, Spanish (or Hispanic Studies) 1A06, 1Z06 with a grade of at least B–. Students who wish to enter this programme, but have not fulfilled the requirements, should consult the Associate Dean (Studies) of the Faculty of Humanities.

Programme Note:

Students must maintain averages of at least 7.0 on *two Cumulative Area Averages*, one in Comparative Literature courses and the other in the language courses selected. This programme, however, has unified Area courses; therefore, only *a single Graduation Average* will be computed on the Level III and IV Area courses.

Area Courses:

All Level II, III, and IV courses in Comparative Literature, and approved Level II, III, and IV courses in the language and literature other than English.

Levels II, III, and IV: 90 units

R Comparative Literature 2A03, 2AA3, 3D03, 3QQ3, 4A03; two of Comparative Literature 4B03, 4C03, 4E03; 15 units of Comparative Literature courses; 36 units of courses in the language and literature other than English above Level I as specified in the description in the Combined Honours component of the language selected. (The overall total must include at least 36 units of Level III and IV work.)

E 18 units elective.

Programme B (With *Two* Languages Other Than English)

Admission:

Completion of **any Level I** programme, including Comparative Literature 1A06 with a grade of at least B–; 12 units covering two different languages from French 1A06, 1B06, German 1A06, 1Z06, Greek 1Z06, Italian 1A06, 1ZZ6, 1Z06, Latin 1Z06, Russian 1Z06, Spanish (or Hispanic Studies) 1A06, 1Z06 with grades of at least B–. Students who wish to enter this programme, but have not fulfilled the requirements, should consult the Associate Dean (Studies) of the Faculty of Humanities.

Programme Notes:

1. Students must maintain averages of at least 7.0 on *two Cumulative Area Averages*, one in Comparative Literature courses and the other in the language courses selected. This programme, however, has unified Area courses; therefore, only *a single Graduation Average* will be computed on the Level III and IV Area courses.
2. Students selecting this option have no free elective choice in the programme.

Area Courses:

All Level II, III, and IV courses in Comparative Literature, and approved Level II, III and IV courses in the two languages and literatures other than English.

Levels II, III and IV: 93 units

R Comparative Literature 2A03, 2AA3, 3D03, 3QQ3, 4A03; two of Comparative Literature 4B03, 4C03, 4E03; 36 units each in the languages and literature other than English above Level I as specified in the description in the Combined Honours component of the languages selected, for a total of 72 units. (The overall total must include at least 36 units of Level III and IV work.)

Programme C (With *English and* Another Language)

Admission:

Completion of **any Level I** programme, including Comparative Literature 1A06 and English 1D06 with grades of at least B–; 6 units from French 1A06, 1B06, German 1A06, 1Z06, Greek 1Z06, Italian 1A06, 1ZZ6, 1Z06, Latin 1Z06, Russian 1Z06, Spanish (or Hispanic Studies) 1A06, 1Z06 with a grade of at least B–. Students who wish to enter this programme, but have not fulfilled the requirements, should consult the Associate Dean (Studies)of the Faculty of Humanities.

Programme Notes:

1. Students must maintain averages of at least 7.0 on *two Cumulative Area Averages*, one in Comparative Literature courses and the other in the language courses selected. This programme, however, has unified Area courses; therefore, only *a single Graduation Average* will be computed on the Level III and IV Area courses.
2. Students selecting this option have no free elective choice in the programme.

Area Courses:

All Level II, III and IV courses in Comparative Literature and approved Level II, III and IV courses in a language and literature other than English; English 2B06, 2G06, 2H06, 2I06, 2V06, 3D03, 3DD3, 3I03, 3K06, 3T03, 3V06, 4B06, 4E06, 4L03, 4M03, 4N06.

Levels II, III and IV: 93 units

R Comparative Literature 2A03, 2AA3, 3D03, 3QQ3, 4A03; two of Comparative Literature 4B03, 4C03, 4E03; 36 units of English Area Courses (12 units each from Levels II, III, and IV); 36 units of a language and literature other than English above Level I as specified in the description in the Combined Honours component of the language selected. (The overall total must include at least 36 units of Level III and IV work.)

COMBINED HONOURS IN COMPARATIVE LITERATURE AND ANOTHER SUBJECT OTHER THAN A LANGUAGE

Admission:

Completion of **any Level I** programme, including Comparative Literature 1A6 with grade of at least B–; 6 units from French 1A06, 1B06, German 1A06, 1Z06, Greek 1Z06, Italian 1A06, 1ZZ6, 1Z06, Latin 1Z06, Russian 1Z06, Spanish (or Hispanic Studies) 1A06, 1Z06 with a grade of at least B–; and a grade of at least B– in the Level I course of the other subject. Students who wish to enter this programme, but have not fulfilled the requirements, should consult the Associate Dean (Studies) of the Faculty of Humanities.

Programme Notes:

1. Students who wish to pursue the study of Comparative Literature in combination with either English or a language other than English should select one of Programmes A, B, or C in Honours Comparative Literature.
2. There will be two Cumulative Area Averages calculated, one in Comparative Literature and one in the Other Subject. The Comparative Literature component is made up of a total of 57 units of work as outlined below.
3. Students selecting this option have no free elective choice in the programme.

Area Courses:

All Level II, III, and IV courses in Comparative Literature and approved Level II, III and IV courses in the language other than English.

Levels II, III, IV: 93 units minimum

R 57 units of work consisting of: Comparative Literature 2A03, 2AA3, 3D03, 3QQ3, 4A03, two of Comparative Literature 4B03, 4C03, 4E03; 36 units in the language and literature other than English above Level I as specified in the description in the Combined Honours component of the language selected. (The overall total must include at least 36 units of Level III and IV work.)

To the total of 57 units of Area work, students must add at least 36 units of Area work in the other component to make a minimum overall total of 93 units beyond Level I.

HONOURS MODERN LANGUAGES AND LINGUISTICS

This programme combines the study of two or more modern languages (French, German, Italian, Russian, Spanish) with a concentration in Linguistics.

Admission:

Completion of **any Level I** programme with 12 units covering two different languages from the following: French 1A06 or 1B06, German 1A06 or 1Z06 or 2Z6, Italian 1A06 or 1Z06 or 1ZZ6, Russian 1Z06, Spanish (or Hispanic Studies) 1A06 or 1Z06 with grades of at least B–. Students are strongly urged to complete Linguistics 1A06 in their Level I programmes. If not, Linguistics 1A06 must be included in Level II of their programme.

Programme Notes:

1. Students must maintain averages of at least 7.0 on *two Cumulative Area Averages*, one in Linguistics courses, and the other in the Modern Language courses selected. This programme, however, has unified Area courses. Therefore, only *a single Graduation Average* will be computed on the Level III and IV Area courses.
2. Students who take French 1Z06 in their Level I programme, *must* take French 1B06 in order to enter the programme.
3. Linguistics 2A06 will be included in calculating the Graduation Average.
4. With the approval of the Programme Co-ordinator and of the Associate Dean of Humanities (Studies), Level III of this programme may be replaced by courses of study at a university or universities where one or more of the student's modern languages is spoken.

Area Courses:

All Level II, III, and IV courses in Linguistics, French, German, Hispanic Studies, Italian, and Russian except literature courses taught in translation. Those courses listed as *Other Related Courses and Language Study* under *Linguistics* in the section *Courses by Department* in this Calendar may be considered as Area courses, with the permission of the Department.

Levels II, III, and IV: 90 units

R Linguistics 2A06, 3A06, 4A06; 18 units of a language other than English above Level I; 18 units of a second language other than English above Level I; 21 units of Area courses. (The overall total must include a minimum of 36 units of Level III and IV Area courses).

E 15 units elective.

MODERN LANGUAGES - GERMAN

COMBINED HONOURS IN GERMAN AND ANOTHER SUBJECT

Alternative A (for students entering with German 1A06)
Admission:

Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B− in German 1A06.

Programme Note:

With the approval of the Department of Modern Languages, and of the Associate Dean of Humanities (Studies), Level III of Honours German may be replaced by courses of study at a university in a German-speaking country.

Area Courses:

All Level II, III and IV German courses, excluding 2Z06.

Levels II, III and IV: 90 units minimum

R 36 units of German which must include at least 24 units of Level III and IV German courses.

E To the minimum total of 72 units of Area work in the two components of the Combined Honours programme, students must add elective work to make a minimum overall total of 90 units beyond Level I. Students are strongly advised to take History 3J06 as an elective.

Alternative B (for students entering with German 1Z06)
Admission:

Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B− in German 1Z06.

Programme Notes:

1. German 2A03, 2B03, 2E03, and 2G03 will be included in calculating the Graduation Average.
2. Students are strongly advised to take History 3J06 as an elective.
3. With the approval of the Department of Modern Languages, and of the Associate Dean of Humanities (Studies), Level III of Honours German may be replaced by courses of study at a university in a German-speaking country.

Area Courses:

All Level II, III and IV German courses.

Levels II, III and IV: 90 units minimum

R German 2A03, 2B03, 2E03, 2G03, 2Y06, 2Z06, and 12 additional units of Level III and IV German courses.

E To the minimum total of 72 units of Area work in the two components of the Combined Honours programme, students must add elective work to make a minimum overall total of 90 units beyond Level I.

HONOURS ARTS AND SCIENCE AND GERMAN (B.ArtsSc.)

(See *Arts and Science Programme*)

HONOURS GERMAN AND POLITICAL SCIENCE

Alternative A (for students entering with German 1A06)
Admission:

Completion of **any Level I** programme with a grade of at least B− in German 1A06 and in Political Science 1A06.

Programme Note:

With the approval of the Departments of Modern Languages and Political Science, and of the Associate Deans of Humanities and Social Sciences, Level III of Honours German and Political Science may be replaced by courses of study at a university in a German-speaking country. Students who plan to spend their third year abroad must have a minimum of B Cumulative Area Averages in each of German and Political Science in their second year.

Area Courses:

History 3J06 and all Level II, III and IV German courses, excluding 2Z06; all Level II, III and IV Political Science courses.

Levels II, III and IV: 90 units

R 36 units of German, 24 of which must include Level III and IV German courses; History 3J06; Political Science 2P06, 9 to 12 units from Political Science 2E06, 3M06, 3PP3, 3QQ3, 3RR3; at least 6 units of Level IV Political Science; 6 to 9 additional units of Political Science, to make a total of 36 units of Area courses in Political Science, only 12 of which may be from Level II courses.

E 12 units.

Alternative B (for students entering with German 1Z06)
Admission:

Completion of **any Level I** programme with a grade of at least B− in German 1Z06 and B− in Political Science 1A06.

Programme Notes:

1. German 2A03, 2B03, 2E03, and 2G03 will be included in calculating the Graduation Average.
2. With the approval of the Departments of Modern Languages and Political Science, and of the Associate Deans of Humanities and Social Sciences, Level III of Honours German and Political Science may be replaced by courses of study at a university in a German-speaking country. Students who plan to spend their third year abroad must have a minimum of B Cumulative Area Averages in each of German and Political Science in their second year.

Area Courses:

History 3J06 and all Level II, III and IV German courses; all Level II, III and IV Political Science courses.

Levels II, III and IV: 90 units

R German 2A03, 2B03, 2E03, 2G03, 2Y06, 2Z06; 12 additional units of Level III and IV German; History 3J06; Political Science 2P06, 9 to 12 units from Political Science 2E06, 3M06, 3PP3, 3QQ3, 3RR3; at least 6 units of Level IV Political Science; 6 to 9 additional units of Political Science, to make a total of 36 units of Area courses in Political Science, only 12 of which may be from Level II courses.

E 12 units.

HONOURS GERMAN

Available only to students who entered this programme **before September 1987.** Students must consult the academic counsellor for German to discuss ways of meeting their programme requirements.

B.A. IN GERMAN

Available only to students who entered this programme **before September, 1987.** Students must consult the academic counsellor for German to discuss ways of meeting their programme requirements.

MODERN LANGUAGES - HISPANIC STUDIES

COMBINED HONOURS IN HISPANIC STUDIES AND ANOTHER SUBJECT

*(Students who entered **any programme in Spanish on or before September 1987**, must consult the academic counsellor for Hispanic Studies to discuss ways of meeting their programme requirements.*

Alternative A (for students entering with Hispanic Studies or Spanish 1A06)

Admission:

Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B− in Hispanic Studies or Spanish 1A06.

Programme Note:

Upon completion of all Level II Hispanic Studies Area courses, with the approval of the Department of Modern Languages, and the Associate Dean of Humanities (Studies), up to 15 units of Level III credit may be replaced by courses of study at a university abroad.

Area Courses:

All Level II, III and IV Hispanic Studies courses.

Levels II, III and IV: 90 units minimum

R Hispanic Studies 2A03, 2B03, 2C03, 2E03, 3A03, 3AA3, 4AA3, and 15 additional units of Level IV Hispanic Literature.

E To the minimum total of 72 units of Area work in the two components of the Combined Honours programme, students must add elective work to make a minimum overall total of 90 units beyond Level I.

Alternative B (for students entering with Hispanic Studies or Spanish 1Z06)

Admission:

Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B− in Hispanic Studies or Spanish 1Z06.

Programme Notes:

1. The following is a recommended distribution of Hispanic Area courses:

   Level II: Hispanic Studies 2Z06, 2A03; 2B03 or 2C03; 2E03.

   Level III: Hispanic Studies 3A03, 3AA3, and 6 units of Hispanic Literature.

   Level IV: Hispanic Studies 4AA3 and 9 units of Hispanic Literature.

2. Upon completion of all Level II Hispanic Studies courses, with the approval of the Department of Modern Languages, and the Associate Dean of Humanities (Studies), up to 15 units of Level III credit may be replaced by courses of study at a university abroad.

Area Courses:

All Level II, III and IV Hispanic Studies courses.

Levels II, III and IV: 90 units minimum

R Hispanic Studies 2Z06; 2B03 or 2C03; 2A03, 2E03 3A03, 3AA3, 4AA3, and 15 units of Level IV Hispanic Literature.

E To the minimum total of 75 units of Area work in the two components of the Combined Honours programme, students must add elective work to make a minimum overall total of 90 units beyond Level I.

MODERN LANGUAGES - ITALIAN

COMBINED HONOURS IN ITALIAN AND ANOTHER SUBJECT

Students who entered any programme in Italian **before September 1988** must consult the academic counsellor of Italian to discuss ways of meeting their programme requirements.

Alternative A (for students entering with Italian 1A06)

Admission:

Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B− in Italian 1A06.

Programme Notes:

1. Recommended Distribution of Italian Area Courses for students following Alternative A:

   Level II: Italian 2A03, 2D03, 2E03, 2EE3.

   Level III: Italian 3D03, 3DD3, 3R03, 3RR3; 3M03 or 4J03.

   Level IV: Italian 4H03 or 4R03; 4M03 and 6 units of Level III or IV Italian.

2. Upon completion of 60 units of work (including 12 units of Level II Italian Area courses), and with the approval of the Department of Modern Languages and the Associate Dean of Humanities (Studies), up to 15 units of Level III Italian work may be replaced by courses of study at an Italian university.

Area Courses:

All Level II, III and IV Italian courses.

Levels II, III and IV: 90 units minimum

R Italian 2A03, 2D03, 2E03, 2EE3, 3D03, 3DD3, 3R03, 3RR3; 3M03 or 4J03; 4M03; 4H03 or 4R03; 6 units of Level III or IV Italian.

E To the minimum total of 75 units of Area work in the two components of the Combined Honours programme, students must add elective work to make a minimum overall total of 90 units beyond Level I.

Alternative B (for students entering with Italian 1Z06 or 1ZZ6)

Admission:

Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B− in Italian 1Z06 or 1ZZ6.

Programme Notes:

1. Recommended Distribution of Italian Area Courses for students following Alternative B:

   Level II: Italian 2E03, 2EE3, 2Z06.

   Level III: Italian 2A03, 2D03, 3R03, 3RR3; 3M03 or 4J03.

   Level IV: Italian 3D03, 3DD3; 4H03 or 4R03; 6 units of Level III or IV Italian.

2. Upon completion of 60 units of work (including 12 units of Level II Italian Area courses), and with the approval of the Department of Modern Languages and the Associate Dean of Humanities (Studies), up to 15 units of Level III Italian work may be replaced by courses of study at an Italian university.

Area Courses:

All Level II, III and IV Italian courses.

Levels II, III and IV: 90 units minimum

R Italian 2A03, 2D03, 2E03, 2EE3, 2Z06, 3D03, 3DD3, 3R03, 3RR3; 3M03 or 4J03; 4H03 or 4R03; 6 units of Level III or IV Italian.

E To the minimum total of 78 units of Area work in the two components of the Combined Honours programme, students must add elective work to make a minimum overall total of 90 units beyond Level I.

HONOURS ITALIAN

Available only to students who entered this programme **before September, 1987.** Students must consult the academic counsellor of Italian to discuss ways of meeting their programme requirements.

B.A. IN ITALIAN

Available only to students who entered this programme **before September, 1987.** Students must consult the academic counsellor of Italian to discuss ways of meeting their programme requirements.

MODERN LANGUAGES - RUSSIAN

COMBINED HONOURS IN RUSSIAN AND ANOTHER SUBJECT

Admission:

Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B− in Russian 1Z06.

Programme Note:

Russian 2A06 will be included in calculating the Graduation Average.

Area Courses:
All Level II, III and IV Russian courses.

Levels II, III and IV: 90 units minimum

R Russian 2A06, 2C06, 3C06, 3K06, 4C06, and 6 units from 4G03, 4H03, 4I03, 4J03, 4K03.

E To the minimum total of 72 units of Area work in the two components of the Combined Honours programme, students must add elective work to make a minimum overall total of 90 units beyond Level I.

HONOURS RUSSIAN AND POLITICAL SCIENCE

Admission:
Completion of **Humanities I** or **Social Sciences I** with a weighted average of at least 7.0 in Russian 1Z06 and Political Science 1A06, including a grade of at least B– in each of Russian 1Z06 and Political Science 1A06.

Programme Note:
Russian 2A06 will be included in calculating the Graduation Average.

Area Courses:
All Level II, III and IV Russian and Political Science courses.

Levels II, III and IV: 90 units

R Russian 2A06, 2C06, 3C06, 3K06, 4C06; and 6 units from 4G03, 4H03, 4I03, 4J03, 4K03;
Political Science 2K06, 3M06, 4J06 and 6 additional units of Level II and 12 additional units beyond Level II in Political Science.

E 18 units.

HONOURS RUSSIAN STUDIES

Available only to students who entered this programme **before September 1987.** Students must consult the academic counsellor for Russian to discuss ways of meeting their programme requirements.

B.A. IN RUSSIAN

Available only to students who entered this programme **before September 1987.** Students must consult the academic counsellor for Russian to discuss ways of meeting their programme requirements.

Department of Music

Completion of a Music degree requires considerable daytime attendance.

HONOURS PROGRAMMES FOR THE B.MUS. DEGREE

Programme A - Music Education - Alternative 1:

Admission:
Completion of **Music I** with a weighted average of at least 7.0 in Music 1B06, 1CC2, 1D02, 1DD2, 1E04 (or 1E06), 1G03.

Programme Notes:

1. The Cumulative Area Average for the Honours Music programmes and for the music portion of the Combined Honours programmes is termed the Cumulative Music Average and is the weighted average of grades in all Area courses attempted. To continue in an Honours Music Programme, a student must maintain a CMA of at least 7.0.
2. Priority is given to students for whom these are Area courses: Music 3B03, 3BB3, 3C04, 3H04, 3K03, 3L03, 3M04, 3N03, 3O03, 3R03, 3V03, 4B03, 4BB3, 4C04, 4H03, 4I03, 4K03, 4L03, 4M04, 4N03, 4O03, 4P03, 4S03, 4Z03, 4ZZ3.
3. Students must complete the minimum of 24 units of non-Music electives as follows:
   12 units by the end of Level I
   18 units by the end of Level II
   24 units by the end of Level III
4. The Graduation Average will be computed on a minimum of 41 units of Level III and IV Area courses.

Area Courses:
Music 2B03, 2BB3, 2C03, 2CC3, 2D02, 2DD2, 2E04, 2G03, 2H04, 3AA3, 3E04, 3G03, 3J04, 3K03, 3L03, 3M04, 3N03, 3O03, 3T03, 3U03, 3V03, 4E04, 4G03, 4K03, 4L03, 4M04, 4N03, 4O03, 4P03.

Levels II, III and IV: 92 units

R Music 2B03, 2BB3, 2C03, 2CC3, 2D02, 2DD2, 2E04, 2G03, 2H04, 3E04, 3G03, 3J04, 4G03; and 27 units from Music 3AA3, 3K03, 3L03, 3M04, 3N03, 3O03, 3T03, 3U03, 3V03, 4K03, 4L03, 4M04, 4N03, 4O03, 4P03 (only one of 3T03, 3U03 may be taken for R-credit).

E 24 units, 12 of which may be from Music.

Programme A - Music Education - Alternative 2:
Alternative 2 is intended for those students in the Education stream who are able to benefit from an increased performance component in their programme.

Admission:
Completion of **Music I** with a weighted average of at least 7.0 in Music 1B06, 1CC2, 1D02, 1DD2, 1E06, 1G03.

Programme Notes:

1. The Cumulative Area Average for the Honours Music programmes and for the music portion of the Combined Honours programmes is termed the Cumulative Music Average and is the weighted average of grades in all Area courses attempted. To continue in an Honours Music Programme, a student must maintain a CMA of at least 7.0.
2. Priority is given to students for whom these are Area courses: Music 3B03, 3BB3, 3C04, 3H04, 3K03, 3L03, 3M04, 3N03, 3O03, 3R03, 3V03, 4B03, 4BB3, 4C04, 4H03, 4I03, 4K03, 4L03, 4M04, 4N03, 4O03, 4P03, 4S03, 4Z03, 4ZZ3.
3. Students must complete the minimum of 24 units of non-Music electives as follows:
   12 units by the end of Level I
   18 units by the end of Level II
   24 units by the end of Level III
4. The Graduation Average will be computed on a minimum of 40 units of Level III and IV Area courses.

Area Courses:
Music 2B03, 2BB3, 2C03, 2CC3, 2D02, 2DD2, 2E06, 2G03, 2H04, 3AA3, 3E06, 3G03, 3J04, 3K03, 3L03, 3M04, 3N03, 3O03, 3T03, 3U03, 3V03, 4E06, 4G03, 4K03, 4L03, 4M04, 4N03, 4O03, 4P03.

Levels II, III, IV: 90 units

R Music 2B03, 2BB3, 2C03, 2CC3, 2D02, 2DD2, 2E06, 2G03, 2H04, 3E06, 3G03, 3J04, 4E06, 4G03, and 18 units from Music 3AA3, 3K03, 3L03, 3M04, 3N03, 3O03, 3T03, 3U03, 3V03, 4K03, 4L03, 4M04, 4N03, 4O03, 4P03. (Only one of 3T03, 3U03 may be taken for R-credit.)

E 21 units, 9 of which may be from Music.

Programme B - Music History and Theory - Alternative 1:

Admission:
Completion of **Music I** with a weighted average of at least 7.0 in Music 1B06, 1CC2, 1D02, 1DD2, 1E04 (or 1E06), 1G03.

Programme Notes:

1. The Cumulative Area Average for the Honours Music programmes and for the music portion of the Combined Honours programmes is termed the Cumulative Music Average and is the weighted average of grades in all Area courses attempted. To continue in an Honours Music Programme, a student must maintain a CMA of at least 7.0.
2. Priority is given to students for whom these are Area courses: Music 3B03, 3BB3, 3C04, 3H04, 3K03, 3L03, 3M04, 3N03, 3O03, 3R03, 3V03, 4B03, 4BB3, 4C04, 4H03, 4I03, 4K03, 4L03, 4M04, 4N03, 4O03, 4P03, 4S03, 4Z03, 4ZZ3.
3. Students must complete the minimum of 24 units of non-Music electives as follows:
   12 units by the end of Level I
   18 units by the end of Level II
   24 units by the end of Level III
4. The Graduation Average will be computed on a minimum of 41 units of Level III and IV Area courses.

Area Courses:
Music 2B03, 2BB3, 2C03, 2CC3, 2D02, 2DD2, 2E04, 2G03, 2H04, 3B03, 3BB3, 3C04, 3E04, 3H04, 3J04, 3R03, 3T03, 3U03, 4B03, 4BB3, 4C04, 4E04, 4H03, 4I03, 4S03, 4Z03, 4ZZ3.

Levels II, III and IV: 92 units

R Music 2B03, 2BB3, 2C03, 2CC3, 2D02, 2DD2, 2E04, 2G03, 2H04, 3C04, 3E04, 3H04, 3J04, 3R03; 3T03 or 3U03; 4C04, 4H03, 4I03; 9 units from Music 3B03, 3BB3, 4B03, 4BB3. (Only one of 3T03, 3U03 may be taken for R-credit.)

E 24 units, 12 of which may be from Music.

Programme B - Music History and Theory - Alternative 2:
Alternative 2 is intended for those students in the History and Theory stream who are able to benefit from an increased performance component in their programme.

Admission:
Completion of **Music I** with a weighted average of at least 7.0 in Music 1B06, 1CC2, 1D02, 1DD2, 1E06, 1G03.

Programme Notes:

1. The Cumulative Area Average for the Honours Music programmes and for the music portion of the Combined Honours programmes is termed the Cumulative Music Average and is the weighted average of grades in all Area courses attempted. To continue in an Honours Music Programme, a student must maintain a CMA of at least 7.0.
2. Priority is given to students for whom these are Area courses: Music 3B03, 3BB3, 3C04, 3H04, 3K03, 3L03, 3M04, 3N03, 3O03, 3R03, 3V03, 4B03, 4BB3, 4C04, 4H03, 4I03, 4K03, 4L03, 4M04, 4N03, 4O03, 4P03, 4S03, 4Z03, 4ZZ3.
3. Students must complete the minimum of 24 units of non-Music electives as follows:
   12 units by the end of Level I
   18 units by the end of Level II
   24 units by the end of Level III
4. The Graduation Average will be computed on a minimum of 40 units of Level III and IV Area courses.

Area Courses:
Music 2B03, 2BB3, 2C03, 2CC3, 2D02, 2DD2, 2E06, 2G03, 2H04, 3B03, 3BB3, 3C04, 3E06, 3H04, 3J04, 3R03, 3T03, 3U03, 4B03, 4BB3, 4C04, 4E06, 4H03, 4I03, 4S03, 4Z03, 4ZZ3.

Levels II, III, IV: 90 units

R Music 2B03, 2BB3, 2C03, 2CC3, 2D02, 2DD2, 2E06, 2G03, 2H04, 3C04, 3E06, 3H04, 3J04, 3R03, 4C04, 4E06; 6 units from Music 3B03, 3BB3, 4B03, 4BB3; 3 units from Music 3T03, 3U03, 4H03, 4I03.

E 21 units, 9 of which may be from Music.

COMBINED HONOURS B.A. IN MUSIC AND ANOTHER SUBJECT

Alternative A: Music Education and Another Subject

Admission:
Completion of **Music I** with a weighted average of at least 7.0 in Music 1B06, 1CC2, 1D02, 1DD2, 1E04 (or 1E06), 1G03.

Programme Notes:

1. The Cumulative Area Average for the Honours Music programmes and for the music portion of the Combined Honours programmes is termed the Cumulative Music Average, and is the weighted average of grades in all Area courses attempted. To continue in an Honours Music Programme, a student must maintain a CMA of at least 7.0.
2. Priority is given to students for whom these are Area courses: Music 3B03, 3BB3, 3C04, 3H04, 3K03, 3L03, 3M04, 3N03, 3O03, 3R03, 3V03, 4B03, 4BB3, 4C04, 4H03, 4I03, 4K03, 4L03, 4M04, 4N03, 4O03, 4P03, 4S03, 4Z03, 4ZZ3.
3. The Department recommends that students enrol in at least one ensemble course as an elective. (The ensemble courses are Music 2G03, 3G03, and 4G03.)
4. Music 2H04 will be included in calculating the Graduation Average.

Area Courses:
Music 2B03, 2BB3, 2C03, 2CC3, 2D02, 2DD2, 2E04, 2H04, 3AA3, 3E04, 3J04, 3K03, 3L03, 3M04, 3N03, 3O03, 3V03, 4K03, 4L03, 4M04, 4N03, 4O03, 4P03.

Levels II, III and IV: 90 units

R Music 2B03, 2BB3, 2C03, 2CC3, 2D02, 2DD2, 2E04, 2H04, 3E04, and 16 additional units of Level III or IV Area courses.

E To the minimum total of 79 units of Area work in the two components of this Combined Honours alternative, students must add elective work to make a minimum overall total of 90 units beyond Level I.

Alternative B: Music History and Theory and Another Subject

Admission:
Completion of **Music I** with a weighted average of at least 7.0 in Music 1B06, 1CC2, 1D02, 1DD2, 1E04 (or 1E06), 1G03.

Programme Notes:

1. The Cumulative Area Average for the Honours Music programmes and for the music portion of the Combined Honours programmes is termed the Cumulative Music Average, and is the weighted average of grades in all Area courses attempted. To continue in an Honours Music Programme, a student must maintain a CMA of at least 7.0.
2. Priority is given to students for whom these are Area courses: Music 3B03, 3BB3, 3C04, 3H04, 3K03, 3L03, 3M04, 3N03, 3O03, 3R03, 3V03, 4B03, 4BB3, 4C04, 4H03, 4I03, 4K03, 4L03, 4M04, 4N03, 4O03, 4P03, 4S03, 4Z03, 4ZZ3.
3. Music 2H04 will be included in calculating the Graduation Average.

Area Courses:
Music 2B03, 2BB3, 2C03, 2CC3, 2D02, 2DD2, 2E04, 2H04, 3B03, 3BB3, 3C04, 3E04, 3H04, 3J04, 3R03, 3T03, 3U03, 4B03, 4BB3, 4C04, 4E04, 4H03, 4I03, 4S03, 4Z03, 4ZZ3.

Levels II, III and IV: 90 units minimum

R Music 2B03, 2BB3, 2C03, 2CC3, 2D02, 2DD2, 2E04, 2H04, 3E04, and 16 additional units of Level III or IV Area courses.

E To the minimum total of 79 units of Area work in the two components of this Combined Honours alternative, students must add elective work to make a minimum overall total of 90 units beyond Level I.

B.A. IN MUSIC

Alternative A (for students entering from **any Level I** programme other than Music I)

Admission:
Completion of **any Level I** programme with a grade of at least C− in Music 1A06; a successful music audition.

Programme Note:
Students must complete the minimum of 24 units of non-Music electives as follows:
12 units by the end of Level I
18 units by the end of Level II
24 units by the end of Level III

Area Courses:
All Level II, III and IV Music courses, except Music 2G03, 3E04, 3G03, 4E04, 4G03.

Levels II and III: 61 units

R Music 1CC2, 1D02, 1DD2, 1E04, 1G03, 2A06, 2C03, 2E04, 2H04; 7 units of Level III or IV Area courses.

E 24 units, 12 of which may be from Music.

Alternative B (for students entering from **Music I**)

Admission:
Completion of **Music I** with a weighted average of at least 4.0 in Music 1B06, 1CC2, 1D02, 1DD2, 1E04 (or 1E06), 1G03.

Programme Note:
Students must complete the minimum of 24 units of non-Music electives as follows:
12 units by the end of Level I
18 units by the end of Level II
24 units by the end of Level III

Area Courses:
All Level II, III and IV Music courses, except Music 2G03, 3E04, 3G03, 4E04, 4G03.

Levels II and III: 60 units

R Either Music 2A06 or Music 2B03 and 2BB3; Music 2C03, 2E04, 2H04; 9 additional units of Area courses including at least 6 units beyond Level II;

10 units from the Faculty of Humanities, which may include Music.

E 24 units, 12 of which may be from Music.

Department of Philosophy

HONOURS ARTS AND SCIENCE AND PHILOSOPHY (B. Arts Sc.)

(See *Arts and Science Programme*)

HONOURS BIOLOGY AND PHILOSOPHY (B.Sc.)

(See *Faculty of Science, Department of Biology*)

HONOURS PHILOSOPHY

Admission:
Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work acceptable to the Department.

Area Courses:
All Level II, III and IV Philosophy courses.

Levels II, III and IV: 90 units

R Philosophy 2A06; one of 2B03, 2R03; 2C06, 3A06, 3G03, 3O03, 4H03 and 24 additional units of Philosophy, at least 21 units of which must be Level III or IV Philosophy courses;

12 units Humanities excluding Philosophy or other non-Philosophy courses approved by the Chairman of the Department and the Associate Dean of Humanities.

E 24 units, 12 of which may be from Philosophy beyond Level I.

COMBINED HONOURS IN PHILOSOPHY AND ANOTHER SUBJECT

Admission:
Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B− in 6 units acceptable to the Department of Philosophy.

Programme Note:
Philosophy 2C06 will be included in calculating the Graduation Average.

Area Courses:
All Level II, III and IV Philosophy courses.

Levels II, III and IV: 90 units minimum

R Philosophy 2A06; one of 2B03, 2R03; 2C06 and 21 units of Levels III and IV Philosophy.

E To the minimum total of 72 units of Area work in the two components of the Combined Honours programme, students must add elective work to make a minimum overall total of 90 units beyond Level I.

HONOURS PHILOSOPHY AND BIOLOGY (B.A.)

Admission:
Completion of **any Level I** programme with a grade of at least B− in Philosophy 1B06 or Philosophy 1D06, and Biology 1A06 or 1G06 with a grade of at least B− and 6 units of Level I Mathematics. Students are cautioned to observe that Chemistry 1A06 is the normal prerequisite for Biology 2B03 and Biology 2C03, which are required courses in the programme.

Programme Note:
The degree programme has unified Area courses; therefore, only a single Cumulative Area Average and Graduation Average is calculated. Students are advised to note carefully the prerequisites for all courses listed in this programme.

Area Courses:
All Level II, III and IV Philosophy courses; all Level II, III and IV Biology courses; Chemistry 2O06.

Levels II, III and IV: 90 units

R Biology 2B03, 2C03, 2E03, 2F03; 24 units from Level III and IV Biology Area courses (Chemistry 2O06 may replace 6 units of the above Biology courses);

Philosophy 2A06; one of 2B03, 2R03; 2C06; one of 2D03, 2G03; 2M03; one of 3G03, 3M03; 3N06; 3O03; 3W03; 4W03; additional Level III or Level IV Philosophy courses to make a total of 42 units of Philosophy.

E 12 units elective.

HONOURS PHILOSOPHY AND MATHEMATICS (B.A.)

Admission:
Completion of **any Level I** programme with a weighted average of at least 7.0 in Mathematics 1A06 and Mathematics 1B03, and a grade of at least B− in 6 units of work acceptable to the Department of Philosophy.

Programme Note:
The degree programme has unified Area courses; therefore, only a single Cumulative Area Average and Graduation Average is calculated.

Area Courses:
All Level II, III and IV Mathematics and Philosophy courses.

Levels II, III and IV: 90 units

R Mathematics 2A06, 2B06, 2F03, 3A06, 3E03,3EE3; 9 units from Mathematics 2C03, 3B03, 3L06, 3P03, 4B06; 6 units from Mathematics 4A06, 4E03, 4K03, 4I03;

Philosophy 2A06; one of Philosophy 2B03, 2R03; 2C06; 24 units of Level III or Level IV Philosophy (including at least one Level IV Philosophy course).

E 9 units elective.

B.A. IN PHILOSOPHY

Admission:
Completion of **any Level I** programme with a grade of at least C− in a Level I course acceptable to the Department.

Area Courses:
All Level II, III and IV Philosophy courses.

Levels II and III: 60 units

R Philosophy 2A06, 2C06, one of Philosophy 2B03, 2R03; 9 units of Philosophy, including at least 6 units of Level III or IV Philosophy; 12 units from the Faculty of Humanities, or 12 units approved by the Department. If no Philosophy course was taken in Level I, 6 units of Philosophy must be included in the 12 units taken from the Faculty of Humanities.

E 24 units, 12 of which may be from Philosophy.

Faculty of Science

R.F. Childs/B.Sc., Ph.D., Dean of Science
D.E.N. Jensen/M.A., Ph.D., Associate Dean of Science (Studies)
A.J. Yarwood/B.Sc., Ph.D., Associate Dean of Science (Studies)
E. Calligan/Student Advisor
P.G. Henry/B.Sc./Student Advisor
M. Lazzarato, Programmes Assistant

The Faculty of Science provides studies through the following Departments:

- ★ Biochemistry
- ★ Biology
- ★ Chemistry
- ★ Computer Science and Systems
- Geography
- ★ Geology
- ★ Mathematics and Statistics
- ★ Materials Science and Engineering
- ★ Physics
- ★ Psychology

All Departments offer four-level Honours B.Sc. programmes which prepare students for graduate studies, Ontario Teacher's Certificate, and industry. A number of Departments offer Combined Honours degrees. An Honours Degree in Molecular Biology and Biotechnology is organized by a Committee of Instruction involving the Faculties of Health Sciences and Science.

Three-level B.Sc. programmes, which provide a science education, but are less extensive and less demanding than the Honours programmes, are also offered by all Departments except Biochemistry, and Materials Science and Engineering. A three-level B.Sc. in Science programme is also available.

Some Departments offer Major programmes as well (which are indicated in the list above by a star). Major programmes require four levels and offer in-depth studies suitable for students who will be seeking employment immediately upon graduation. Some of the Major programmes can also lead to an Ontario Teacher's Certificate. Major programmes are also distinguished from Honours programmes by being less specialized and somewhat less demanding.

Academic Regulations

The programmes of the Faculty are set out by Level, and the Academic Regulations of the University specify that courses must be taken in the sequence specified in the programmes. This means that students in the Faculty of Science must have completed or be registered in the remaining courses for one Level before they may register in courses for the next Level.

For all Honours and Major programmes in the Faculty of Science which combine the work of two disciplines, a single Cumulative Area Average and a single Graduation Average will be computed.

Students enrolled in a programme in the Faculty of Science, in addition to meeting the General Academic Regulations, shall be subject to the following Faculty of Science Regulations.

COURSE SELECTION

It is the responsiblity of the student to ensure that the selection of courses meets the degree requirements for the programme in which the student is registered and that the stated prerequisite courses were completed with a mark of a least D−.

PROGRAMME AND COURSE CHANGES

All programme and course changes must be made through the Office of the Deans of Science (Studies) and are subject to the deadline dates established by the University. (See *Sessional Dates* section of this Calendar.)

Beyond the September deadline date, first-term courses may be cancelled up to the October deadline but may not be replaced by second-term courses; beyond the January deadline date, second-term courses may not be replaced. Students who cancel a full-year course by the January deadline date may add a second-term course provided that their second-term work load is not thereby increased.

Up to the end of Level III, students may be permitted to transfer between B.Sc. and Major, and Major and Honours, programmes, on the recommendation of the Department concerned and with the approval of an Associate Dean (Studies).

EXTRA COURSES

Extra courses are courses taken in addition to those required for the degree programme in which the student is registered. Permission to take *Extra* courses must be obtained from the Office of the Deans of Science (Studies) and such courses must be designated *Extra* at the time of registration. The grades obtained in *Extra* courses will be included in neither the Cumulative Area Average nor the number of units required for graduation.

MAJOR PROGRAMMES

The following describes the change in regulations for Major programmes in the Faculty of Science. (Students in Honours, Combined Honours, and B.Sc. programmes should note the appropriate University-wide regulations in the section *Academic Regulations.*)

Admission: Students seeking admission **after August 1987**, will require a weighted average of 5.0 in Level I courses, or a grade of at least C in a specified course. The relevant courses are specified, under *Admission*, in each programme description.

Continuation in a Major Programme:

For students admitted to a Major programme **after August 1987**: If you obtain a Cumulative Area Average of 5.0, you may continue in a Major programme. If you fail to obtain a Cumulative Area Average of 5.0, but have an average of at least 4.5, you may continue on Programme Probation for one reviewing period. You may be on Programme Probation only once. If you fail to obtain a Cumulative Area Average of 4.5 you may not continue in the programme and must seek entry to another programme.

For students admitted to a Major programme **before September 1987**: If you obtain a Cumulative Area Average of 4.0, you may continue in a Major programme. If you fail to obtain a Cumulative Area Average of 4.0, but have an average of at least 3.5, you may continue on Programme Probation for one reviewing period. You may be on Programme Probation only once. If you fail to obtain a Cumulative Area Average of 3.5 you may not continue in the programme and must seek entry to another programme.

Graduation: Graduation standing in Major degree programmes is awarded in three classes. For first-class standing, a minimum Graduation Average of 9.5 is required; for second-class standing 7.0; and for third-class standing 5.0 for those who enter a Major programme **after** August 1987, and 4.0 for those who were admmitted to a Major programme **before** September 1987.

RE-ADMISSION TO THE FACULTY OF SCIENCE

A student who is ineligible to continue in the Faculty of Science may apply for re-admission. Application for re-admission must be made in writing **by June 15** to the Chairman of the Committee on Re-admissions, Office of the Deans of Science (Studies), and should include an explanation of the student's previous academic performance and reasons why the student would expect to succeed in the programme if re-admitted. If the student has been Required to Withdraw for one calendar year, a letter of reference from an employer may be required.

Readmission is not guaranteed.

LIMITED ENROLMENT

Because of resource limitations, the University reserves the right to limit enrolment in any programme or course to the number which can be effectively taught. In the Faculty of Science, enrolment will be by selec-

tion, based on academic achievement. Students should consult with the Departments concerned if there are any questions about entry to limited enrolment programmes.

Limited Enrolment in Computer Science: Enrolment is limited to students in Level II of a *programme* in which a final year Computer Science project course is required i.e. all Computer Science and combined Computer Science *programmes*.

Selection will take place normally at the end of Level I, when students apply to register in Computer Science 2MC3. The selection will be based on the student's University Average. Once admitted to one of these programmes, students will be allowed to complete the desired degree programme, subject to maintaining the required standing.

Students completing McMaster Level I programmes will be given preference over students seeking admission from other programmes or other universities.

All Computer Science *courses* except for the final year project courses are open to any student who has the prerequisite specified.

SECOND BACHELOR'S DEGREE PROGRAMMES

In addition to the regulations stated in the section *Academic Regulations, Second Bachelor's Degree Programmes* in this Calendar, the following Faculty regulations will apply, effective September 1987.

Students will be admitted to Second Degree studies only if the second degree studies involve a significant component of work in the Area courses of a programme. Accordingly, permission will not be granted to take Second Degrees in the following cases or subject combinations:

1. in a subject which was a title component of a first combined Honours or Major degree. (e.g. Computer Science *following* Computer Science and Mathematics)
2. in a combined Honours or Major degree to a holder of another degree in a component subject of that degree. (e.g. Computer Science and Mathematics *following* Computer Science)
3. an Honours degree to a holder of a Major degree in the same subject.
4. in B.Sc. Science to a holder of another B.Sc. degree (either three- or four-year) in a programme given by a department.
5. in three-year departmental B.Sc. programmes requiring courses which constitute a significant component of an initial B.Sc. Science degree.
6. in the B.Sc. degree to a holder of the B.A. degree in the same subject.

Level I Programme

NATURAL SCIENCES I: 30 UNITS

Mathematics 1A06 or 1C06

One or two of a) or b):

a. Chemistry 1A06
b. Physics 1A06 or 1B06 or 1C06

Additional selections from c.) to j.) to make a total of 30 units:

c. Biology 1A06
d. Computer Science 1MA3, or 1ZA3, **or** 1MA3 and 1MB3
e. Geography 1A06
f. Geology 1A03 and/or 1C03
g. Materials Science 1A03, or 1A03 and 1B03
h. Mathematics 1B03
i. Psychology 1A06
j. 3 or 6 units of Level I Humanities and/or Social Sciences.

With the exception of Mathematics, no more than one full-year course may be taken from any subject.

With the permission of the Associate Dean (Studies), well-prepared students may be permitted to elect up to six additional units.

The choice in the programme that a first level student may elect is considerable and should be made carefully with the Level II admission requirements of a specific programme in mind. A suitable choice of Level I options will allow successful students to enter Level II of any one of several programmes.

Students in the Faculty of Science registering in Mathematics 1B03 must register in Mathematics 1A06 rather than Mathematics 1C06.

Students who have completed Mathematics 1C06 and later complete Mathematics 1B03 are eligible to take upper level Mathematics courses.

Students who complete Natural Sciences I with high standing but who lack a Level I course required for entry into the desired Level II programme may be permitted entry to that programme after consultation with an Associate Dean (Studies) and the appropriate Departmental Chairman.

Department of Biochemistry

HONOURS ARTS AND SCIENCE AND BIOCHEMISTRY (B.Arts Sc.)

(See *Arts and Science Programme)*

HONOURS BIOCHEMISTRY

This programme fulfills the academic requirements for professional membership in the Chemical Institute of Canada. General Biochemistry and Biotechnology and Genetic options are available at Level IV.

Admission:

Completion of **Natural Sciences I**, with an average of at least 7.0 in Biology 1A06, Chemistry 1A06, and one of Mathematics 1A06, 1C06, Physics 1A06, 1B06, 1C06. The election of one of Physics 1A06, 1B06, 1C06 in Level I or II is recommended.

Programme Note:

Biochemistry 2A03 will be included in calculating the Graduation Average.

Area Courses:

Biochemistry 2A03, 3A06, 3B03, 3C03, 3L06, 3N03, 4A03, 4B06, 4D03, 4E03, 4F03, 4G03, 4H03, 4I03, 4L03, 4M03, 4P03, 4Q03; Biology 2B03, 2C03, 3O03, 4I03, 4V03; Chemistry 2N03, 2O06, 2Q06, 3D03.

Level II: 30 units

R Biochemistry 2A03; Chemistry 2N03, 2O06, 2Q06; Biology 2B03 and 2C03.

E 6 units. Chemistry 2C03 or 2F03; Computer Science 1MA3 or 1ZA3 and Statistics 2M03 are suggested.

Level III: 30 units

R Biochemistry 3A06 and 3L06; Chemistry 3F03; Biology 3O03; 6 units from Biology 2B03 (if not completed) and Level III or IV Biochemistry, Biology or Chemistry courses.

(For students planning to enter the *Biotechnology and Genetic Engineering Option*, Biology 2B03 and 3O03 must be completed by the end of Level III.)

E 6 units, excluding Biochemistry.

Level IV (General Biochemistry Option): 30 units

R One of Biochemistry 4B06, 4L03, 4G03, 4P03; Biochemistry 4E03, 4I03, 4M03; 6 to 9 units of Level III and IV Biochemistry courses to make a total of 21 units (maximum of 6 units from Biochemistry 4B06, 4G03, 4L03, 4P03); 3 units of Level III and IV courses from any Science discipline other than Biochemistry.

E 6 units.

Level IV (Biotechnology and Genetic Engineering Option): 30 units

A CAA of at least 7.0 on completion of Level III is required for admission.

R One of Biochemistry 4B06, 4G03, 4P03; Biochemistry 4D03, 4E03, 4I03, 4M03; 3 to 6 units of Level III and IV Biochemistry courses to make a total of 21 units (maximum of 6 units from Biochemistry 4L03, 4P03, 4B06); 3 units of Level III and IV courses from any Science discipline other than Biochemistry (Biology 3O03 must be selected if not taken at Level III. Biology 4I03 and 4V03 are recommended).

E 6 units.

HONOURS BIOCHEMISTRY AND CHEMISTRY

This programme fulfills the academic requirements for professional membership in the Chemical Institute of Canada.

Admission:
Completion of **Natural Sciences I**, including Chemistry 1A06, Mathematics 1A06, 1B03, and one of Biology 1A06, Physics 1A06, 1B06, 1C06, with an average of at least 7.0 in Mathematics 1A06 and Chemistry 1A06. Election of both Biology and Physics is highly recommended.

Area Courses:
Biochemistry 2A03, 3A06, 3B03, 3C03, 3L03, 3L06, 4A03, 4B06, 4D03, 4E03, 4I03, 4M03, 4Q03, 4U06; Chemistry 2A03, 2B06, 2C03, 2Q06, 2P06, 3A03, 3B03, 3C03, 3D03, 3E06, 3KK6, 3L03, 3Q03, 3U03, 4A03, 4D03, 4G06, 4K06, 4L03, 4U06.

Level II: 33 units

R Biochemistry 2A03; Chemistry 2A03, 2B06, 2C03, 2P06 or 2Q06; Mathematics 2N03; Biology 1A06, and one of Physics 1A06, 1B06, 1C06, if not completed in Level I; courses in a Science discipline to make a total of 30 units. Students considering Level III Honours Biochemistry should elect Biology 2C03. Students considering Level III Honours Chemistry should elect Physics 2A03.

E Electives to make a total of 33 units.

Level III: 33 units (1989-90 only)

R Biochemistry 3A06; one of Biochemistry 3L03, 3L06; Chemistry 3D03; one of Chemistry 3A03 or 3E06; Chemistry 3U03.

E Electives to make a total of 33 units.

Level III: 33 units (commencing 1990-91)

R Biochemistry 3A06; one of Biochemistry 3L03, 3L06; Chemistry 3D03; one of Chemistry 3A03, 3Q03, or 3E06; Chemistry 3B03.

E Electives to make a total of 33 units.

Level IV: 33 units (1989-91 only)

R Biochemistry 4E03, 4I03 and 4M03, and one of Biochemistry 4D03, 4Q03; Biochemistry 4B06, or 4U06 (same as Chemistry 4U06), or Chemistry 4G06; one of Chemistry 4A03, 4D03 4K06; 3 units of Level III or IV Chemistry. (Maximum of 6 units of laboratory.)

E Electives to make a total of 33 units.

Level IV: 33 units (commencing 1991-92)

R Biochemistry 4E03, 4I03 and 4M03, and one of Biochemistry 4D03, 4Q03; Biochemistry 4B06, or 4U06 (same as Chemistry 4U06), or Chemistry 4G06; one of Chemistry 4A03, 4D03, 3C03 or 3KK6; 3 units of Level III or IV Chemistry. (Maximum of 6 units of laboratory.)

E Electives to make a total of 33 units.

BIOCHEMISTRY MAJOR

Admission:
Completion of **Natural Sciences I**, with an average of at least 5.0 in Biology 1A06, Chemistry 1A06, and one of Mathematics 1A06, 1C06, Physics 1A06, 1B06, 1C06. The election of one of Physics 1A06, 1B06, 1C06 in Level I or II is recommended.

Programme Note:
Biochemistry 2A03 will be included in calculating the Graduation Average.

Area Courses:
Biochemistry 2A03, 3A06, 3B03, 3C03, 3L06, 3N03, 4B06, 4D03, 4E03, 4F03, 4G03, 4H03, 4I03, 4L03, 4M03, 4P03, 4Q03; Biology 2B03, 2C03, 3O03, 4I03, 4V03; Chemistry 2B06, 2F03, 2N03, 2O06, 2Q06, 3D03, 3F03.

Level II: 30 units

R Biochemistry 2A03; Chemistry 2Q06, 2O06; one of Chemistry 2C03, 2N03; Biology 2B03 and 2C03.

E 6 units.

Level III: 30 units

R Biochemistry 3A06 and 3L06; Chemistry 3F03; 3 units of Level III or IV Biochemistry or Biology Area courses; and 6 units from any Science discipline.

E 6 units.

Level IV: 30 units

R Biochemistry 4L03; one of Biochemistry 4E03, 4I03, 4M03, and 9 units of Level III and IV Biochemistry Area courses (maximum of 6 units from Biochemistry 4B06, 4G03, 4L03, 4P03) and 9 units of courses from any Science discipline.

E 6 units.

Department of Biology

HONOURS PHILOSOPHY AND BIOLOGY (B.A.)

(see *Faculty of Humanities, Department of Philosophy*)

HONOURS ARTS AND SCIENCE AND BIOLOGY (B.Arts Sc.)

(see *Arts and Science Programme*)

HONOURS BIOLOGY

Admission:
Completion of **Natural Sciences I**, including Chemistry 1A06, and one of Physics 1A06, 1B06, 1C06 with at least B– in Biology 1A06 and at least B– in one of Mathematics 1A06, 1C06, Chemistry 1A06, Physics 1A06, 1B06, 1C06. For those students entering **Level III Honours Biology in 1990-91**, Computer Science 1ZA3 (or 1MA3) must have been previously completed.

Programme Notes:

1. Students are advised to note carefully the prerequisites for all Levels III and IV courses listed in the following programme, particularly Biochemistry 3G06.
2. Students interested in Honours Biology and Pharmacology should elect Chemistry 2Q06 in Level II.
3. Computer Science 1ZA3 is recommended.

Area Courses:
All Levels II, III and IV Biology courses; Biochemistry 3B03, 3C03, 3G06, 4D03, 4E03, 4M03; Engineering 4X03; Geography 3P03, 4P03; Geology 2J03, 3D06, 3J03, 4D03, 4F03; Psychology 3F06, 3R03, 3S03, 3T03.

Level II: 30 units

R Biology 2B03, 2C03, 2D03, 2E03, 2F03; Chemistry 2O06; Chemistry 2Q06 or Statistics 2R06; Computer Science 1ZA3 (or 1MA3) (if not completed).

E Electives, excluding Biology and Biochemistry to make a total of 30 units.

Level III: 30 units

R 18 units from Levels III and IV Area courses in Biology; 6 units of Area courses.

E 6 units, at least 3 of which must not be from Biology or Biochemistry.

Level IV: 31-32 units

R 19 to 20 units of Levels III and IV Area courses in Biology, including Biology 4F04 or 4C08; 6 units of Area courses.

E 6 units

HONOURS BIOLOGY AND PHARMACOLOGY

The offering of this programme in contingent upon approval by the Ontario Council on University Affairs and resource approval from the Board/Senate Committee on Academic Planning (BSCAP). Further information should be obtained from the Associate Dean (Studies) of Science.

Admission:
Completion of **Level II Honours Biology** with a weighted average of at least 7.0 in Biology 2B03, 2C03, 2D03, 2E03, 2F03 and a weighted average of at least 7.0 in Chemistry 2O06, 2Q06; Computer Science 1MA3 or 1ZA3.

These are the minimal academic requirements. The student enrolment in this programme will be limited to 25 per year. Information about this programme and the selection procedure can be obtained from the Chairman of the Committee of Instruction and will also be explained in the month of January in an Information Session. It is highly recommended that students interested in enrolling in the programme attend the Information Session. Students wishing to apply must make a formal written request to the Chairman of the Committee of Intruction for this programme before February 15. The selection will be based on interviews and/or tutorial sessions to be held in the first weekend in March as well as on academic performance. Successful candidates will be notified.

Programme Note:
This is a five year Co-op programme, three terms of which must be spent off-campus in work related to pharmacology, toxicology or pharmaceutics. These three terms will include the summer term following the com-

pletion of Level III, the second term of Level IV and the first term of the fifth year. Level IV continues through the fourth and fifth year of the programme. A senior thesis will be completed during the summer of the fourth year. Pharmacology courses with the exception of Pharmacology 4B03 will be taught using a problem-based, self-directed learning approach. Pharmacology 4B03 will be taught in a lecture format.

Area Courses:
Biochemistry 3G06; Biology 2B03, 2C03, 2D03, 2E03, 2F03, 3A06, 3C03, 3E03, 3H03, 3HH3, 3I03, 3K06, 3N06, 3O06, 3P03, 3U06, 4C08, 4D03, 4E03, 4I03, 4M03, 4MM3, 4N03, 4V03, 4X03; Chemistry 2O06, 2Q06; Pharmacology 3A06, 3B03, 4A03, 4AA3, 4B03, 4C03, 4D03, 4F09.

Level III: 30 units

R Biology 3P03, 3U06; Biochemistry 3G06; Pharmacology 3A06, 3B03.

E 6 units. Biochemistry 3H03, Biology 3O03, Chemistry 2N03 or Statistics 2R06 are recommended.

Level IV: 38-39 units

R One of Biology 4C08, Pharmacology 4F09 to be taken in the summer term; Biology 4I03; one of Biology 4M03, 4MM3 or 4N03; 6 units of Level III or IV Area courses; Pharmacology 4A03, 4AA3 and two of Pharmacology 4B03, 4C03, 4D03.

E 6 units. Statistics 2R06 is recommended (if not completed).

HONOURS BIOLOGY AND PHILOSOPHY

Admission:
Completion of **Natural Sciences I**, including Chemistry 1A06 with at least B− in Biology 1A06 and at least B− in Philosophy 1B06 or 1D06.

Programme Note:
Students are advised to note carefully the prerequisites for all courses listed in this programme. No student may register in any level of this programme without the approval of the Chairman of the Biology Department. Students are advised to consult the Chairman for counselling in March.

Area Courses:
All Levels II, III and IV Biology courses except Biology 4C08; Biochemistry 3B03, 3G06; all Levels II, III and IV Philosophy courses.

Levels II, III and IV: 99 units

R Biology 2B03, 2C03, 2E03, 2F03; 12 units from Biology 3F06, 3H03, 3HH3, 3I03, 3J03, 3N06, 3O03, 3Q03, Biochemistry 3G06; 12 additional units from Levels III and IV Biology Area courses; Chemistry 2O06 or both Chemistry 2D03 and Biochemistry 2E03; Philosophy 2A06; one of Philosophy 2B03, 2R03, 2C06; one of Philosophy 2D03, 2G03, 2M03; one of Philosophy 3G03, 3N06, 3M03; 3O03; 3W03; 4W03; additional Level III and IV Philosophy courses to make a total of 45 units of Philosophy.

E 12 units (Chemistry 2Q06 is recommended.)

HONOURS BIOLOGY AND PSYCHOLOGY

Admission:
Completion of **Natural Sciences I**, including Chemistry 1A06, one of Physics 1A06, 1B06, 1C06, with at least B− in Biology 1A06 and at least B− in Psychology 1A06.

Programme Notes:

1. Students must complete a minimum of one laboratory course in Psychology and one in Levels III or IV Biology. A minimum of 18 units from Psychology and a minimum of 18 units from Biology must be included in the total required courses for Levels III and IV combined.
2. Enrolment is limited for the Psychology laboratory courses. Permission of the department must be obtained by March 1.
3. Biology 2E03 will be included in calculating the Graduation Average.

Area Courses:
Biology 2B03, 2C03, 2E03, 3AA3, 3F06, 3H03, 3HH3, 3I03, 3J03, 3K06, 3N06, 3O03, 3P03, 3Q03, 3U06, 4C08, 4E03, 4F04, 4I03, 4M03, 4MM3, 4N03, 4X03; Psychology 2E03, 2H03, 2R06, 2T03, 3A03, 3B03, 3E03, 3F06, 3G03, 3H03, 3K03, 3L03, 3N06, 3Q03, 3QQ3, 3P03, 3R03, 3S03, 3T03, 3U03, 3V03, 3W06, 3X03, 3Z03, 3Y03, 4A03, 4B03, 4D06, 4F03, 4G03, 4H03, 4Q03, 4QQ3; Statistics 2R06.

Level II: 33 units

R Biology 2B03 and 2C03; 6 units from Psychology 2E03, 2H03, 2T03; Statistics 2R06 or Psychology 2R06; Chemistry 2O06.

E 9 units. Students are advised to take English 3A03 and Chemistry 2Q06 as electives in Levels II and III.

Level III: 33 units

R 12 units from Biology 2E03, 3AA3, 3F06, 3H03, 3HH3, 3I03, 3J03, 3N06, 3O03, 3P03, 3U06; 12 units from Psychology 2E03, 2H03, 2T03, 3A03, 3E03, 3F06, 3G03, 3H03, 3K03, 3L03, 3N06, 3P03, 3R03, 3S03, 3T03, 3U03, 3V03, 3W06, 3X03, 3Y03, 3Z03; Biochemistry 3G06.

E 3 to 6 units, excluding Biology or Psychology, to make a total of 33 units.

Level IV: 33-34 units

R One of Biology 4F04, 4C08, Psychology 4D06; 18 to 22 units (with at least 9 units from Biology and 9 units from Psychology) from Levels III and IV Biology Area courses and Levels III and IV Psychology Area courses.

E Electives to make a total of 33 to 34 units.

BIOLOGY MAJOR

Admission:
Completion of **Natural Sciences I**, including Chemistry 1A06, with at least C in Biology 1A06, and at least C in one of Mathematics 1A06, 1C06, Chemistry 1A06, Physics 1A06, 1B06, 1C06. One of Physics 1A06, 1B06, 1C06, is strongly recommended in Level I. For those students entering **Level III Honours Biology in 1990-91**, Computer Science 1ZA3 (or 1MA3) must have been previously completed.

Programme Notes:

1. Students in Levels III and IV of this programme should select Area courses in consultation with the Chairman of the Department of Biology.
2. Computer Science 1ZA3 is recommended.

Area Courses:
All Levels II, III and IV Biology courses, except Biology 4C08; Biochemistry 3B03, 3G06, 4D03, 4E03, 4M03; Engineering 4X03; Geography 3P03, 4P03; Geology 2J03, 3J03, 4D03, 4F03; Psychology 3F06, 3R03, 3S03, 3T03.

Level II: 30 units

R Biology 2B03, 2C03, 2D03, 2E03, 2F03; Chemistry 2O06; Computer Science 1ZA3 (or 1MA3) if not completed.

E 9 units, at least 3 units of which may not be from Biology or Biochemistry.

Level III: 30 units

R 18 units of Area courses, of which 12 units must be Biology courses.

E 12 units, at least 3 units of which may not be from Biology or Biochemistry.

Level IV: 30-31 units

R 18 to 19 units of Area courses, of which 12-13 units must be Biology courses.

E 12 units, at least 3 units of which may not be from Biology or Biochemistry.

B.Sc. IN BIOLOGY

Admission:
Completion of **Natural Sciences I**, including Chemistry 1A06, and at least a grade of C in Biology 1A06. One of Physics 1A06, 1B06, 1C06, is strongly recommended in Level I.

Area Courses:
All Levels II and III Biology courses; Geography 3P03; Geology 2J03, 3J03; Psychology 3F06, 3T03.

Level II: 30 units

R Biology 2B03, 2C03, 2D03, 2E03, 2F03; Chemistry 2D03; Biochemistry 2E03; Computer Science 1MA3 (if not completed).

E 6 to 9 units, of which 6 may not be from Biology.

Level III: 30 units

R 18 units of Level III Biology Area courses; Statistics 2R06.

E 6 units which may not be from Biology.

Department of Chemistry

HONOURS BIOCHEMISTRY AND CHEMISTRY

(See *Department of Biochemistry*)

HONOURS APPLIED CHEMISTRY

This programme fulfills the academic requirements for membership in the Chemical Institute of Canada.

Admission:
Completion of **Natural Sciences I**, including Chemistry 1A06, and Mathematics 1A06 and 1B03. A grade of at least B – must be achieved in Chemistry 1A06 and one of Mathematics 1A06, 1B03, Physics 1A06, 1B06, 1C06. One of Physics 1A06, 1B06, 1C06 must be taken before entry into Level III; its election in Natural Sciences I is strongly recommended.

Programme Note:
Recommended electives throughout the programme include Engineering 2O03; Materials 2C04, 4D03, 4E03; Metallurgy 3C03, 4C04, 4N03; Chemical Engineering 3D03, 3P03, 4K03, 4N04; Business 3W06, 3X03, 3Y03, 3Z03; Physics 2A03.

Area Courses:
Chemistry 2A03, 2B06, 2C03, 3A03, 3B03, 3C03, 3D03, 3E06, 3I03, 3KK6, 3L03, 3U03, 4A03, 4C03, 4D03, 4G06, 4K06, 4L03, 4P03, 4R03, 4S03, 4T06; Chemical Engineering 2D04, 2F04, 3K03, 3M04.

Level II: 32 units

R Chemistry 2A03, 2B06, 2C03; Chemical Engineering 2D04, 2F04; Computer Science 1MA3, if not completed in Level I; Mathematics 2N03.

E 6 to 9 units, excluding Chemistry.

Level III: 31 units (1989-90 only)

R Chemistry 3D03, 3E06, 3I03, 3L03, 3U03; Chemical Engineering 3M04.

E 9 units, excluding Chemistry.

Level III: 31 units (commencing 1990-91)

R Chemistry 3B03, 3D03, 3E06, 3I03 and 3C03 or 3KK6; Chemical Engineering 3M04.

E 6 to 9 units, excluding Chemistry.

Level IV: 30 units (1989-91 only)

R Chemistry 3A03, 4G06 or 4T06; either Chemistry 4K06 or Chemical Engineering 3K03; 6 units of Level IV Area courses; an additional 3 units from Level III or IV Science or Engineering courses.

E 6 to 9 units.

Level IV: 30 units (commencing 1991-92)

R Chemistry 3A03, 4G06 or 4T06; either Chemistry 4L03 or Chemical Engineering 3K03; 6 units of Level IV Area courses; an additional 3 units from Level III or IV Science or Engineering courses.

E 9 units.

HONOURS CHEMISTRY

This programme fulfills the academic requirements for membership in the Chemical Institute of Canada.

Admission:
Completion of **Natural Sciences I**, including Chemistry 1A06, and Mathematics 1A06 and 1B03. A grade of at least B – must be achieved in Chemistry 1A06 and one of Mathematics 1A06, 1B03, Physics 1A06, 1B06, 1C06. One of Physics 1A06, 1B06, 1C06 must be taken before entry into Level III; its election in Natural Sciences I is strongly recommended.

Programme Note:
For students interested in physical chemistry, recommended electives throughout the programme include Statistics 2M03 and Mathematics 3C03, 3D03 (if Mathematics 2G03 and 2C03 were taken instead of Mathematics 2N03).

Area Courses:
Chemistry 2A03, 2B06, 2C03, 2P06, 2T06, 3A03, 3B03, 3D03, 3E06, 3I03, 3L03, 3KK6, 3U03, 4A03, 4B03, 4C03, 4D03, 4G06, 4K06, 4L03, 4P03, 4Q03, 4R03, 4S03, 4Y03.

Level II: 30 units

R Chemistry 2A03, 2B06, 2C03, 2P06; Mathematics 2N03; Physics 2A03; Computer Science 1MA3, if not completed in Level I.

E 3 to 6 units, excluding Chemistry.

Level III: 30 units (1989-90 only)

R Chemistry 3A03, 3D03, 3E06, 3L03, 3U03.

E 12 units, 6 of which may not be Chemistry.

Level III: 30 units (commencing 1990-91)

R Chemistry 3A03, 3B03, 3D03, 3E06, 3KK6.

E 9 units, 6 of which may not be Chemistry.

Level IV: 30 units (1989-91 only)

R Chemistry 4G06, 4K06, and 6 units of Level IV Area courses; an additional 6 units from Level III or IV Science or Engineering courses.

E 6 units.

Level IV: 30 units (commencing 1991-92)

R Chemistry 4G06, 4L03, and 9 units of Level IV Area courses; an additional 6 units from Level III or IV Science or Engineering courses.

E 6 units.

HONOURS CHEMISTRY AND GEOLOGY

This programme fulfills the academic requirements for membership in the Chemical Institute of Canada.

Admission:
Completion of **Natural Sciences I**, including Chemistry 1A06, Geology 1A03 or 1C03, Mathematics 1A06 and 1B03, with a grade of at least B – in each of Chemistry 1A06 and Geology 1A03 or 1C03. The election of Physics 1A06 is recommended.

Programme Notes:

1. Geology 2D06 will be included in calculating the Graduation Average.
2. Geology 3E02 is normally taken at the end of Level II and is scheduled outside the regular term. Geology 2E01 is taken during the regular term of Level II.

Area Courses:
Chemistry 2A03, 2B06, 2C03, 2P06, 2T06, 3A03, 3B03, 3E06, 3L03, 3U03, 4C03, 4P03, 4R03, 4S03; all Geology courses above Level I except Geology 3E02 and 2E01.

Level II: 34 units

R Chemistry 2B06, 2C03, 2P06; Geology 2E01, 2B06, 2C03, 2DD3; Mathematics 2N03.

E 3 units, excluding Chemistry and Geology.

Level III: 33 units (1989-90 only)

R Chemistry 2A03, 3E06, 3U03; Geology 2DD3; 3C06, 3DD3, 3E02, 3G04. Attention is drawn to Geology 3E02 which is scheduled outside of regular term.

E 3 units.

Level III: 32 units (commencing 1990-91)

R Chemistry 2A03, 3B03, 3E06; Geology 3CC6, 3E02, 3G03, 3Q03; one of Geology 2I03, 2J03, or 3DD3.

E 3 units.

Level IV: 30 units

R 21 units selected as follows: Chemistry 3A03; 18 units of Levels III and IV Chemistry and Geology to include at least 6 units of Area courses from each. Note that Geology 3C06, 2D06 and 3G04 will not be available after 1990-91.

E 9 units.

HONOURS CHEMISTRY AND PHYSICS

This programme fulfills the academic requirements for membership in the Chemical Institute of Canada.

Admission:
Completion of **Natural Sciences I**, including Mathematics 1A06 and 1B03, Chemistry 1A06 and Physics 1A06, with a grade of at least B – in Chemistry 1A06, Physics 1A06, and one of Mathematics 1A06 or 1B03. Students will also be considered for admission if they have completed Physics 1B06 or 1C06, instead of 1A06. However, Physics 1A06 is strongly recommended.

Programme Note:

Chemistry 2A03 will be included in calculating the Graduation Average.

Area Courses:

Chemistry 2A03, 2B06, 2C03, 2P06, 2T06, 3C03, 3E06, 3KK6, 3Q03, 4B03, 4C03, 4G06, 4K06, 4L03, 4Q03, 4Y03; Physics 2B06, 2C05, 3B06, 3K04, 3M06, 3M03, 3MM3, 3N03, 4F03, 4J04, 4K03, 4Q04.

Level II: 35 units

R Chemistry 2B06, 2C03, 2P06; Physics 2B06, 2C05; Mathematics 2G03, 2O03.

E 3 units. Computer Science 1MA3 is recommended (if not taken in Level I).

Level III: 33-34 units (1989-90 only)

R Chemistry 2A03, 3E06; Physics 3M03, 3MM3; 6 to 10 units from Physics 3B06, 3K04, 3N03; Mathematics 3C03, 3D03.

E Electives to make a total of 33 to 34 units. (Courses which are prerequisites for desired Level IV courses should be considered.)

Level III: 33-34 units (commencing 1990-91)

R Chemistry 2A03, 3Q03, 3C03 or 3KK6; Physics 3M03, 3MM3; 6 to 10 units from Physics 3B06, 3K04, 3N03; Mathematics 3C03, 3D03.

E Electives to make a total of 33 to 34 units. (Courses which are prerequisites for desired Level IV courses should be considered.)

Level IV: 31-34 units (1989-91 only)

R At least 25 units of Level III and Level IV Chemistry and Physics, which must include: Chemistry 4G06 or Physics 4J04 or Physics 4Q04; Physics 4F03; Chemistry 4K06; Chemistry 4Y03 or Physics 3K04, if not taken in Level III.

E 6 to 9 units.

Level IV: 31-34 units (commencing 1991-92)

R At least 25 units of Level III and Level IV Chemistry and Physics, which must include: Chemistry 4G06 or Physics 4J04 or Physics 4Q04; Physics 4F03; Chemistry 4L03, 4B03; Chemistry 4Y03 or Physics 3K04, if not taken in Level III.

E 6 to 9 units.

CHEMISTRY MAJOR

This programme fulfills the academic requirements for membership in the Chemical Institute of Canada.

Admission:

Completion of **Natural Sciences I**, including Chemistry 1A06 and Mathematics 1A06 and 1B03. A grade of at least C must be achieved in Chemistry 1A06 and one of Mathematics 1A06, 1B03, Physics 1A06, 1B06, 1C06. One of Physics 1A06, 1B06, 1C06 must be taken before entry into Level III; its election in Natural Sciences I is strongly recommended.

Programme Notes:

1. Recommended electives throughout the programme include Computer Science 2MF3.
2. With Departmental permission, Chemistry 4G06 can be substituted for Chemistry 4T06. Only Level IV students with a CAA of at least 8.5 will be considered, and only if sufficient projects are available.

Area Courses:

Chemistry 2A03, 2B06, 2C03, 2F03, 2K03, 2O06, 2P06, 3A03, 3B03, 3D03, 3F03, 3G03, 3I03, 3K03, 3KK6, 3Q03, 4A03, 4B03, 4C03, 4D03, 4G06, 4K06, 4L03, 4P03, 4Q03, 4R03, 4S03, 4T06, 4Y03.

Level II: 30 units

R Chemistry 2A03, 2B06, 2C03, 2P06; Mathematics 2N03; Computer Science 1MA3 (if not completed in Level I).

E 6 to 9 units, excluding Chemistry. Physics 2A03 is strongly recommmended.

Level III: 30 units (1989-90 only)

R Chemistry 3B03, 3F03, 3G03, 3I03, 3K03, 3Q03.

E 12 units, excluding Chemistry.

Level III: 30 units (commencing 1990-91)

R Chemistry 3A03, 3B03, 3D03, 3KK6, 3Q03; Physics 2A03 if not already taken.

E 9 to 12 units.

Level IV: 30 units (1989-91 only)

R Chemistry 4K06, 4T06 and 6 units of Level IV Area courses; Physics 2A03.

E 9 units.

Level IV: 30 units (commencing 1991-92)

R Chemistry 4L03, 4T06 and 9 units of Level IV Area courses.

E 12 units.

B.Sc. IN CHEMISTRY

Admission:

Completion of **Natural Sciences I**, including Chemistry 1A06 with a grade of at least C−, and Mathematics 1A06. Mathematics 1B03, and one of Physics 1A06, 1B06, 1C06 must be taken before Level III. The election of one of Physics 1A06, 1B06, 1C06 in Natural Sciences I is strongly recommended.

Area Courses:

Chemistry 2A03, 2B06, 2C03, 2F03, 2K03, 2O06, 2P06, 3A03, 3B03, 3F03, 3G03, 3I03, 3K03, 3Q03.

Level II: 30 units

R Chemistry 2A03, 2B06, 2C03, 2P06; Computer Science 1MA3 (if not completed in Level I).

E 9 to 12 units.

Level III: 30 units (1989-90 only)

R Chemistry 3B03, 3I03, 3K03, 3Q03; Mathematics 2N03, if not taken previously.

E 15 to 18 units, at least 6 units of which may not be Chemistry.

Level III: 30 units (commencing 1990-91)

R Chemistry 3A03, 3B03, 3I03, 3Q03; Mathematics 2N03, if not taken previously.

E 15 to 18 units, at least 6 units of which may not be Chemistry.

Department of Computer Science and Systems

Because of resource limitations, **enrolment** in Computer Science and all joint programmes involving Computer Science **is limited**. Students intending to enter any Computer Science programme should consult the Department.

HONOURS MATHEMATICS AND MATHEMATICS MAJOR AND B.SC. IN MATHEMATICS

(See *Mathematics and Statistics*)

HONOURS STATISTICS AND STATISTICS MAJOR

(See *Mathematics and Statistics*)

HONOURS ECONOMICS AND COMPUTER SCIENCE (B.A.)

(See *Faculty of Social Sciences, Department of Economics*)

HONOURS ARTS AND SCIENCE AND COMPUTER SCIENCE (B. Arts Sc.)

(See *Arts and Science Programme*)

HONOURS COMPUTER SCIENCE

Admission:

Completion of **any Level I** programme with a weighted average of at least 7.0 in Computer Science 1MA3, 1MB3, and Mathematics 1A06, and 1B03.

Programme Notes:

1. Students entering from another Faculty must complete the requirements of the Natural Sciences I programme *before entry* to Level IV.
2. It is recommended that students choose a coherent set of electives. The following possibilities should be noted:

   Numerical Analysis Option: Mathematics 2A06, 3Q03, 4Q06.
   Computer Science Theory: Computer Science 4J03, 4X03; Mathematics 4C03, 4J03, 4S03.
   Hardware Option: Mathematics 2A06, 2C03; Physics 2B06, 3B06, 4D06.

Area Courses:
Computer Science 2B03, 2L03, 2MC3, 2MD3, 2ME3, 2MF3, 2MJ3, and all Level III and IV Computer Science courses; Mathematics 2A06, 2B06, 2C03, 2E03, 2F03, 2J06, 3B03, 3E03, 3EE3, 3L06, 3Q03, 3R03, 4C03, 4J03, 4Q03, 4RR3, 4S03; Statistics 2D03, and all Level III and IV Statistics courses; Physics 2B06, 3B06, 4D06.

Level II: 30 units

R Computer Science 2MC3, 2MD3, 2ME3, 2MF3; either Mathematics 2B06 and 2F03, or 2J06; Mathematics 2A06 or 2G03.

E 3 to 9 units.

Level III: 30 units
Computer Science 3MG3, 3MH3, 3MI3, two of 3CA3, 3EA3, 3IA3, 3TA3; 6 units of Level III and IV Area courses from Mathematics or Statistics.

E 9 units, at least 6 of which must not be Computer Science, Mathematics or Statistics.

Level IV: 30 units (1989-90 only)

R Computer Science 4G06; 9 units from Level IV Computer Science courses, and Level III and IV Mathematics courses; 6 units of Area courses.

E 9 units, which may include Mathematics 2A06, 2B06, 2C03.

Level IV *(commencing 1990-91)*
In 1990-91 students will make their Level IV course selection according to their chosen area of specialization. You are urged to note the prerequisites for these courses carefully in order to ensure you have made adequate preparation.

Level IV: 30 units *Computer Systems*

R Computer Science 4CB3, 4CC3, 4CD3, 4CP6; 9 units of Level III and IV Area courses, including 3EA3 if not already completed.

E 6 units.

Level IV: 30 units *Software Engineering*

R Computer Science 4EB4, 4EC3, 4ED3, 4EP6; 9 units of Level III and IV Area courses.

E 6 units.

Level IV: 30 units *Artificial Intelligence*

R Computer Science 4IB3, 4IC3, 4ID3, 4IP6; Mathematics 4C03, 4J03; 3 units of Level III and IV Area courses, including 3EA3 if not already completed.

E 6 units.

Level IV: 30 units *Theory of Computation*

R Computer Science 4TB3, 4TC3, 4TD3, 4TP6; Mathematics 4C03, 4J03; 3 units of Level III and IV Area courses, including 3EA3 if not already completed.

E 6 units.

HONOURS COMPUTER SCIENCE AND MATHEMATICS

Admission
Completion of **Level II Honours Mathematics** including Computer Science 2MC3, 2MD3, 2MF3, or **Level II Honours Computer Science** including Mathematics 2A06 and 2B06.

Area Courses:
Computer Science 2ME3, 2MF3, 2MJ3 and all Level III and IV Computer Science courses; Mathematics 2C03, 2E03, 2F03, 3A06, 3E03, 3EE3, 3F03, 3FF3, 3G03, 3L06, 3Q03, 3R03, 3T03, 3X03, 3Y03, 4A06, 4C03, 4G03, 4J03, 4O03, 4Q03, 4RR3, 4S03; Statistics 3D06, 3S03, 3U03, 4H03, 4K03, 4M03, 4R03, 4S03, 4T03, 4U03, 4V03, 4X03, 4Z03.

Levels III and IV: 60 units
(for students entering Level III of the programme in **1988-89**)

R Computer Science 3A03, 3D03, 4G06, 6 units of Computer Science Area courses; Mathematics 2C03 or 2O03 (if neither completed), 2F03 (if not completed), 3A06, and one of Mathematics 4A06, 4C03, 4J03, 4Q03, 4S03; 6 units of Mathematics or Statistics Area courses; 6 units of Area courses.

E Electives to make a total of 60 units, at least 6 of which must not be from either the Department of Mathematics and Statistics, or from the Department of Computer Science and Systems.

Levels III and IV: 60 units
(for students entering Level III of this programme in **1989-90**)

R Computer Science 2ME3, 2MF3 (if not completed), 3MG3, 3MH3, 3MI3, 4MP6 and one of Computer Science 3CA3, 3EA3, 3GA3, 3IA3, and 3TA3; Mathematics 2C03 or 2O03 (if neither completed), 2F03 (if not completed); Mathematics 3A06 and one of Mathematics 4A06, 4C03, 4J03, 4Q03, 4S03; 6 units of Mathematics or Statistics Area courses; 3 units of Area courses. (Computer Science 3EA3 is strongly recommended).

E Electives to make a total of 60 units, at least 6 of which must not be from either the Department of Mathematics and Statistics, or the Department of Computer Science and Systems.

HONOURS COMPUTER SCIENCE AND PSYCHOLOGY

Admission:
Completion of **Natural Sciences I** with a weighted average of 7.0 in Computer Science 1MA3, 1MB3, Mathematics 1A06, 1B03 and Psychology 1A06, including a grade of at least b− in each of Computer Science 1MA3, 1MB3 and Psychology 1A06.

Programme Notes:

1. Students must complete at least one laboratory course in Psychology. Enrolment is limited in the laboratory courses, and *permission* of the department must be obtained *by March 1*.
2. Students who entered this programme **prior to September 1988**, must complete *either* Psychology 2E03 or 3W06.

   Students who enter this programme **from September 1988**, must complete Psychology 2E03.

Area courses:
All Psychology courses above Level I; Computer Science 2MC3, 2MD3, 2ME3, 2MF3, 2MJ3 and all Level III and IV Computer Science courses; Statistics 2D03; Mathematics 4S03.

Level II: 30 units

R Computer Science 2MF3 (if 1C03 not already completed), 2MC3, 2MD3; Psychology 2E03, 2T03, 2H03; Statistics 2D03; either Mathematics 2F03 and 2B06 or Mathematics 2J06.

E Electives to make a total of 30 units

Level III: 30 units

R Computer Science 3MG3, 3MH3, 3MI3, one of Computer Science 3CA3, 3EA3, 3IA3, 3TA3; 3 additional units of Computer Science Area courses; 12 units from Level III Psychology.

E 3 units.

Level IV: 30 units (1989-90 only)

R Computer Science 4G06 or Psychology 4D06 (the project or thesis topic must be approved by the Chairmen of *both* departments); Computer Science 3SD3; Mathematics 4S03; 6 additional units Level III or IV Computer Science; 9 additional units Levels III or IV Psychology.

E 3 units.

Level IV: 30 units (commencing 1990-91)

R Computer Science 4MP6 or Psychology 4D06 (the project or thesis topic must be approved by the Chairman of *both* departments); Computer Science 3SD3, 4TC3, 6 additional units of Level III or IV Computer Science (Computer Science 3EA3 is strongly recommended); 9 additional units of Level III or IV Psychology.

E 3 units.

HONOURS COMPUTER SCIENCE AND STATISTICS

Admission:

Completion of **Level II of Honours Mathematics** including Computer Science 2MC3, 2MD3 and either 2MF3 or 2MJ3 and Statistics 2D03, or **Level II of Honours Computer Science** including Mathematics 2A06 and 2B06 and Statistics 2D03.

Area Courses:

Computer Science 2ME3, 2MF3, 2MJ3 and all Level III and IV courses; Mathematics 2C03, 2E03, 3Q03, 3R03, 3T03, 4G03, 4H03, 4K03, 4O03, 4Q03, 4RR3, 4S03; Statistics 2M03 and all Level III and IV Statistics courses.

Levels III and IV: 60 units

(for students entering Level III of this programme in **1988-89**)

R Computer Science 3A03, 4G06; Mathematics 2C03 or 2O03 (if neither completed), 3T03; Statistics 3D06, 2M03 (if not completed); 6 units of Mathematics Area courses; 6 units of Statistics Area courses; 12 units of Computer Science Area courses; 3 units of Level III or IV Area courses.

E Electives to make a total of 60 units, at least 6 of which must not be from either the Department of Mathematics and Statistics, or the Department of Computer Science and Systems.

Levels III and IV: 60 units

(for students entering Level III of this programme in **1989-90**)

R Computer Science 2ME3, 2MF3 (if not completed), 3MG3, 3MH3, 3MI3, 4MP6 and one of Computer Science 3CA3, 3EA3, 3GA3, 3IA3, 3TA3; Mathematics 2C03 or 2O03 (if neither completed), and 3T03; Statistics 3D06, 2M03 (if not completed); 6 units of Mathematics Area courses; 6 units of Statistics Area courses; 3 units of Level III or IV Area courses (Computer Science 3EA3 is strongly recommended).

E Electives to make a total of 60 units, at least 6 of which must not be from either the Department of Mathematics and Statistics, or the Department of Computer Science and Systems.

COMPUTER SCIENCE MAJOR

Admission:

Completion of **any Level I** programme with a weighted average of at least 5.0 in Computer Science 1MA3, 1MB3, and Mathematics 1A06 and 1B03.

Programme Notes:

1. 1987-1988: Students who entered this programme from another Faculty **in September 1987**, must complete the requirements of the Natural Sciences Level I programme *before entry* to Level IV.
2. It is recommended that students choose a coherent set of electives. The following possibilities should be noted:
   Numerical Analysis Option: Mathematics 2G03, 2O03, 3Q03, 4Q03.
   Computer Science Theory: Computer Science 4J03, 4X03; Mathematics 4C03, 4J03, 4S03.
   Hardware Option: Mathematics 2G03, 2O03; Physics 2B06, 3B06, 4D06.

Area Courses:

Computer Science 2MC3, 2MD3, 2ME3, 2MF3, 2MJ3 and all Level III and IV Computer Science courses; Mathematics 2E03, 2G03, 2J06, 2O03, 3E03, 3EE3, 3L08, 3Q03, 3R03, 4C03, 4J03, 4Q03, 4RR3, 4S03; Statistics 2D03, 2M03, and all Level III and IV Statistics courses; Physics 2B06, 3B06, 4D06.

Level II: 30 units

R Computer Science 2MC3, 2MD3, 2ME3, 2MF3; Mathematics 2G03 and 2J06.

E 9 units, at least 6 of which must not be from either the Department of Computer Science and Systems, or the Department of Mathematics and Statistics.

Level III: 30 units

R Computer Science 3MG3, 3MH3, 3MI3, and two of 3CA3, 3EA3, 3IA3, 3TA3; 3 units of Mathematics or Statistics Area courses.

E 12 units, at least 6 of which must not be Computer Science, Mathematics or Statistics.

Level IV: 30 units (1989-90 only)

R Computer Science 3T03, 4G06; 9 units of Level III and IV Computer Science Area courses; 3 to 6 additional units of Area courses.

E 6 to 9 units.

Level IV Commencing 1990-91

In 1990-91, students will make their Level IV course selection according to their chosen area of specialization. You are urged to note the prerequisites for these courses carefully in order to ensure you have made adequate preparation.

Level IV: 30 units *Computer System*

R Computer Science 4CB3, 4CC3, 4CD3, 4CP6; 6 units of Level III and IV Area courses, including 3EA3 if not already completed.

E 9 units.

Level IV: 30 units *Software Engineering*

R Computer Science 4EB3, 4EC3, 4ED3, 4EP6; 6 units of Level III and IV Area courses.

E 9 units.

Level IV: 30 units *Artificial Intelligence*

R Computer Science 4IB3, 4IC3, 4ID3, 4IP6; Mathematics 4C03 or 4J03; 3 units of Level III or IV Area courses (Computer Science 3EA3 should be chosen if not already completed).

E 9 units.

Level IV: 30 units *Theory of Computation*

R Computer Science 4TB3, 4TC3, 4TD3, 4TP6; Mathematics 4C03 or 4J03; 3 units of Level III or IV Area courses (Computer Science 3EA3 should be chosen if not already completed).

E 9 units.

COMPUTER SCIENCE AND MATHEMATICS MAJOR

Admission:

Completion of **Level II of Mathematics Major**, including Computer Science 2MC3, 2MD3 and either 2MF3 or 2MJ3 and Statistics 2D03, or **Level II of Computer Science Major**, including Mathematics 2G03 and 2O03.

Area Courses:

Computer Science 2ME3, 2MF3, 2MJ3 and all Level III and IV Computer Science courses; Mathematics 2E03, 3E03, 3EE3, 3F03, 3FF3, 3L06, 3O06, 3Q03, 3R03, 3T03, 4C03, 4G03, 4J03, 4K03, 4O03, 4Q03, 4RR3, 4S03; Statistics 3D06, 2M03, 3S03, 3U03, 4H03, 4J03, 4K03, 4M03, 4R03, 4S03, 4T03, 4U03, 4Z03.

Levels III and IV: 60 units

(for students entering Level III of this programme in **1988-89**)

R Computer Science 3A03, 3D03, 4G06, 6 units of Computer Science Area courses; Mathematics 3O06 and 6 units from 3Q03, 3T03, 4C03, 4J03, 4O03, 4Q03, 4S03; 6 units of Mathematics or Statistics Area Courses; 6 additional units of Area Courses.

E 18 units, at least 6 units of which must not be from either the Department of Mathematics and Statistics, or the Department of Computer Science and Systems.

Level III and IV: 60 units

(for students entering Level III of this programme in **1989-90**)

R Computer Science 2ME3, 2MF3 (if not already completed), 3MG3, 3MH3, 3MI3, 4MP6 and one of 3CA3, 3EA3, 3GA3, 3IA3, 3TA3; Mathematics 3O06 and 6 units from 3Q03, 3T03, 4C03, 4J03, 4O03, 4Q03, 4S03; 6 units of Level III and IV Mathematics or Statistics Area courses; 3 additional units of Level III and IV Area courses (Computer Science 3EA3 is strongly recommended).

E 15 to 18 units, to a total of 60 units, at least 6 units of which must not be from either the Department of Mathematics and Statistics, or the Department of Computer Science and Systems.

COMPUTER SCIENCE AND STATISTICS MAJOR

Admission:

Completion of **Level II of Mathematics Major** including Computer Science 2MC3, 2MD3 and either 2MF3 or 2MJ3 and Statistics 2D03, or **Level II Computer Science Major** including Mathematics 2G03 and 2O03 and Statistics 2D03.

Area Courses:
Computer Science 2ME3, 2MF3, 2MJ3 and all Level III and IV Computer Science courses; Mathematics 2E03, 3Q03, 3R03, 3T03, 4G03, 4O03, 4Q03, 4RR3; Statistics 2M03, and all Level III and IV Statistics courses.

Levels III and IV: 60 units
(for students entering Level III of this programme in **1988-89**)

R Computer Science 3A03, 4G06; Mathematics 3T03; Statistics 3D06, 2M03 (if not completed); 27 units of Level III and IV Area courses selected as follows: 12 units of Computer Science, 6 units of Statistics, 6 units of Statistics or Mathematics, 3 additional units.

E 12 to 15 units a total of 60 units, at least 6 units of which must not be from either the Department of Mathematics and Statistics, or from the Department of Computer Science and Systems.

Levels III and IV: 60 units
(for students entering Level III of this programme in **1989-90**)

R Computer Science 2ME3, 2MF3 (if not already completed), 3MG3, 3MH3, 3MI3, 4MP6; one of Computer Science 3CA3, 3EA3, 3GA3, 3IA3, and 3TA3; Mathematics 3T03, Statistics 3D03, 2M03 (if not completed); 15 units of Level III and IV Area courses selected as follows: 6 units of Statistics, 6 units of Mathematics and Statistics, 3 additional units. (Computer Science 3EA3 is strongly recommended).

E 12 to 18 units to a total of 60 units, at least 6 units of which must not be from either the Department of Mathematics and Statistics, or from the Department of Computer Science and Systems.

B.Sc. IN COMPUTER SCIENCE

Admission:
Completion of **any Level I** programme with a weighted average of at least 4.0 in Computer Science 1MA3, 1MB3, and Mathematics 1A06.

Programme Notes:

1. It is recommended that students should choose their electives so that 18 units of Level II and Level III courses are in a single subject. Economics 1A06 and Business 3W06 are recommended.
2. It is recommended that students elect Statistics 2M03 in Level III.

Area Courses:
Computer Science 2MC3, 2MD3, 2ME3, 2MF3, 2MJ3 and all Level III and IV Computer Science courses; all Level II, III and IV Mathematics and Statistics courses; Business 3W06.

Level II: 30 units

R Computer Science 2MF3 (if 1C03 not completed), 2ME3, 2MC3, 2MD3; 3 units of any Mathematics or Statistics courses.

E 15 to 18 units to a total of 30 units, at least 6 units of which must not be from either the Department of Computer Science and Systems, or the Department of Mathematics and Statistics.

Level III: 30 units

R Computer Science 3MG3, 3MH3, 3MI3, 3MP6, and one of Computer Science 3CA3, 3EA3, 3IA3, 3TA3. (Computer Science 3EA3 is strongly recommended)

E 12 units, at least 6 units of which must not be Computer Science, Mathematics or Statistics.

Department of Geography

HONOURS GEOGRAPHY (B.A.) AND B.A. IN GEOGRAPHY, AND HONOURS GEOGRAPHY AND GEOLOGY (B.A.)

(See B.A. Programmes in Geography, *Faculty of Social Sciences, Department of Geography*)

HONOURS ECONOMICS AND GEOGRAPHY (B.A.)

(See *Faculty of Social Sciences, Department of Economics*)

HONOURS HISTORY AND GEOGRAPHY (B.A.)

(See *Faculty of Humanities, Department of History*)

HONOURS ARTS AND SCIENCE AND GEOGRAPHY (B.Arts Sc.)

(See *Arts and Science Programme*)

HONOURS GEOGRAPHY (B.Sc.)

Admission:
Completion of **Natural Sciences I**, with at least a B− in Geography 1A06, and an average of at least 7.0 in that and 6 additional units of Mathematics, Geology, Chemistry, Physics or Biology.

Programme Note:
No student may register in any Level of this programme without the approval of a Departmental Counsellor, which should be obtained before completing registration forms in March.

Area Courses:
Geography 2F03, 2K03, 2LL3, 2L03, 2T03, 2W03, 3E03, 3F03, 3I03, 3K03, 3L03, 3M03, 3NN3, 3O03, 3P03, 3V03, 3W03, 4A03, 4C06, 4D03, 4E03, 4H03, 4K03, 4N03, 4P03, 4Q03, 4R03, 4W03.

Level II: 30 units

R Geography 2F03, 2K03, 2LL3, 2L03, 2T03, 2W03.

E 12 units

Level III: 30 units

R Geography 3E03 and 3O03; 12 units from Geography 3F03, 3K03, 3M03, 3NN3, 3P03, 3W03.

E 12 units, 6 of which may not be in Geography.

Level IV: 30 units

R Geography 4C06, and at least 12 additional units of Level IV Area courses.

E 12 units, 6 of which may not be from Geography.

HONOURS GEOGRAPHY AND ENVIRONMENTAL SCIENCE (B.Sc.)

The offering of this programme is contingent upon approval by the Ontario Council on University Affairs and resource approval from the Board/Senate Committee on Academic Planning (BSCAP). Further information should be obtained from the Associate Deans (Studies) of Science.

Admission:
Completion of **Natural Sciences I**, including Chemistry 1A06 with at least a B− in Biology 1A06 and at least a B− in Geography 1A06. Students must complete Geology 1A03 or 1C03 by the end of Level II.

Area Courses:
Biochemistry 2E03; Biology 2D03, 2E03, 2F03, 3A06, 3SS3, 3TT3, 4D03, 4Y03; Chemistry 2D03, 2F03; Geography 2F03, 2K03, 2LL3, 2L03, 2T03, 2U03, 2W03, 3C03, 3E03, 3F03, 3G03, 3J03, 3K03, 3M03, 3NN3, 3O03, 3P03, 3U03, 3V03, 3W03, 4A03, 4C06, 4D03, 4K03, 4N03, 4P03, 4Q03, 4R03, 4S03, 4T03, 4V06, 4W03; Geology 2C03, 4S03, 4U03.

Level II: 30 units

R Geography 2LL3, 2L03, 2U03; Biology 2F03; Chemistry 2D03; 6 units from Geography 2F03, 2K03, 2T03, 2W03; 3 units of Area courses which must not be from the Department of Geography.

E 6 units. Biochemistry 2E03 is recommended.

Level III: 30 units

R Geography 3C03, 3E03, 3J03, 3O03, 3U03; Biochemistry 2E03 (if not already completed); 3 units of Level III or IV Area courses; 3 units of Area courses which may not be from the Department of Geography.

E 6 units

Level IV: 30 units

R Geography 4C06, 4V06; 6 units Level III or IV Area courses; 6 units Area courses which may not be from the Department of Geography.

E 6 units

HONOURS GEOGRAPHY AND GEOLOGY (B.Sc.)

Admission:
Completion of **Natural Sciences I**, including Geography 1A06, Geology 1A03 or 1C03, and Mathematics 1A06 or 1C06 with a grade of at least B− in both Geography 1A06 and Geology 1A03 or 1C03. Chemistry 1A06 must be completed by the end of Level II.

Programme Notes:

1. No student may register in any Level of this programme without the approval of a Departmental Counsellor, which must be obtained before completing registration forms in March.
2. Geology 2D06 will be included in calculating the Graduation Average.
3. Geology 3E02 is normally taken at the end of Level II. This course is scheduled outside of the regular term.

Area Courses:
Geography 2F03, 2K03, 2LL3, 2L03, 2T03, 2W03, 3E03, 3F03, 3I03, 3K03, 3M03, 3NN3, 3O03, 3P03, 3V03, 3W03, 4A03, 4C06, 4D03, 4E03, 4K03, 4N03, 4P03, 4Q03, 4R03, 4W03; all Geology courses above Level I except Geology 2E01 and 3E02.

Level II: 31 units
R Geography 2LL3, 2L03, 2T03, and one of Geography 2F03, 2K03, 2W03; Geology 2B06, 2C03, 2DD3, 2E01 and 3 to 6 units of Natural Science or Engineering approved by the Departments.
E Electives excluding Geography and Geology to make a total of 31 units.

Level III: 32 units (1989-90)
R Geography 3E03, 3M03, 3O03, and one of 3F03, 3K03, 3NN3, 3P03, 3W03; Geology 2DD3, 3DD3, 3E02.
E 6 units, at least 3 of which may not be Geography or Geology.

Level III: 32 units (1990-91)
R Geography 3E03, 3M03, 3O03, and one of 3F03, 3K03, 3NN3, 3P03, 3W03; Geology 3CC6, 3E02 and one of Geology 2J03, 2I03, 3DD3 and 3F03.
E 9 units, at least 3 of which may not be Geography or Geology.

Level IV: 30-33 units (1989-90 and 1990-91)
R 18 units of Area courses including 6 units of Level IV Geography Area courses, and 6 units of Level IV Geology Area courses and 6 units of Level IV Geography Area courses or Level III or IV Geology courses.
E Electives to make a total of 30 to 33 units. Geology 3G04 or 3G03 is strongly recommended.

Level IV: 30-33 units (1991-92)
R 18 units of Area courses including 6 units of Level IV Geography Area courses, and 6 units of Level IV Geology Area courses and 6 units of Level IV Geography Area courses or Level III or IV Geology courses, Geology 3S03 must be taken if not already completed.
E Electives to make a total of 30 to 33 units. Geology 3G03 is strongly recommended.

B.Sc. IN GEOGRAPHY

Admission:
Completion of **Natural Sciences I**, with a grade of at least C− in Geography 1A06, and an average of at least 4.0 in that and another six units of Science.

Programme Note:
No student may register in any Level of this programme without the approval of a Departmental Counsellor, which should be obtained before completing registration forms in March.

Area Courses:
Geography 2F03, 2K03, 2LL3, 2L03, 2M03, 2T03, 2W03, 3E03, 3F03, 3I03, 3K03, 3L03, 3M03, 3NN3, 3O03, 3P03, 3V03, 3W03.

Level II: 30 units
R Geography 2L03 and 15 units of Level II Area courses.
E 12 units.

Level III: 30 units
R 18 units of Level III Area courses.
E 12 units, 6 of which may not be in Geography.

Department of Geology

HONOURS CHEMISTRY AND GEOLOGY

(See *Department of Chemistry*)

HONOURS GEOGRAPHY AND GEOLOGY (B.Sc.)

(See *Department of Geography*)

HONOURS GEOGRAPHY AND GEOLOGY (B.A.)

(See *Faculty of Social Sciences, Department of Geography*)

HONOURS GEOLOGY

Admission:
Completion of **Natural Sciences I** including one of Geology 1A03 or 1C03, and Mathematics 1A06 and Chemistry 1A06, and one of Physics 1A06, 1B06, 1C06. A grade of B− must be obtained in Geology 1A03 or 1C03 and one other course listed.

Programme Notes:

1. Geology 3E02 is normally taken at the end of Level II. This course is scheduled outside of the regular term.
2. Materials 3D03, a prerequisite to Geology 4B03, should be taken in Level III.

Area Courses:
All Geology courses above Level I except Geology 2E01 and 3E02.

Level II: 34 units
R Geology 2B06, 2C03, 2DD3, 2E01, 2I03, 2J03; Chemistry 2P06; Biology 2E03; Mathematics 1B03 or Statistics 2M03.
E 3 units, excluding Geology.

Level III: 30 units (1989-90)
R Geology 2J03, 3C06, 3E02, 3G04, 3J03; 6 units Science and/or Engineering courses.
E 6 units, excluding Geology.

Level III: 32 units
(for students entering Level III in **1990-91**)
R Geology 3CC6, 3DD3, 3E02, 3F03, 3G03, 3J03, 3Q03.
E 9 units, 3 of which may not be from Geology. Geology 3S03 must be completed in Level III or IV.

Level IV: 30 units (1989-91)
R Geology 4B03 or 4BB3, 4E06 or 4K06, 4M03 and 4MM3, 6 units of Level IV Geology.
E 9 units.

Level IV: 30 units
(for students entering Level IV in **1991-92**)
R Geology 4T03; 12 units of Level IV Geology; Geology 3S03, if not taken previously.
E 12 to 15 units.

HONOURS GEOLOGY AND PHYSICS

Admission:
Completion of **Natural Sciences I**, including one of Geology 1A03 or 1C03, Physics 1A06, and Chemistry 1A06, and Mathematics 1A06 and 1B03, with a grade of at least B− in each of Geology 1A03 or 1C03, and Physics 1A06. Students will also be considered for admission if they have completed Physics 1B06 or 1C06 instead of Physics 1A06; however, Physics 1A06 is strongly recommended.

Programme Notes:

1. Geology 2D06 will be included in calculating the Graduation Average.
2. Geology 3E02 is normally taken at the end of Level II. This course is scheduled outside of the regular term.

Area Courses:
All Geology courses above Level I except Geology 2E01 and 3E02; Physics 2B06, 2C05, 3G03, 3M06, 3M03, 3MM3, 3S03, 4B04, 4K03; Mathematics 3C03, 3D03.

Level II: 36 units
R Geology 2B06, 2C03, 2DD3, 2E01, 2I03; Physics 2B06, 2C05; Mathematics 2G03, 2O03.
E 3 units excluding Geology and Physics. Computer Science 1MA3 is strongly recommended.

Level III: 35 units (1989-90)
R Geology 3C06, 3A03 or 3B03; Geology 3E02; Physics 2H03 or Chemistry 2P06; Physics 3M03, 3MM3; Physics 3G03 or 3S03; Mathematics 3C03 and 3D03.
E 3 to 6 units.

Level III: 35 units
(for students entering Level III in **1990-91**)

R Geology 3CC6, 3DD3, 3E02; Physics 2H03 or Chemistry 2P06; Physics 3M03, 3MM3; Physics 3G03 or 3S03; Mathematics 3C03 and 3D03.

E 3 to 6 units. Geology 3A03 or 3B03 is strongly recommended.

Level IV: 31-34 units (1989-90)

R Geology 3C06, 3A03 or 3B03, whichever not already completed; Physics 4B04, 4K03; one of Physics 3G03 or 3S03, whichever not already completed; 6 additional units of Level III or IV Geology or Physics.

E 6 to 9 units.

Level IV: 31-34 units (1990-91)

R Geology 2DD3, 3DD3; 3A03 or 3B03, whichever not already completed; Physics 4B04, 4K03; one of Physics 3G03 or 3S03, whichever not already completed; 6 additional units of Level III or IV Geology or Physics.

E 6 to 9 units.

Level IV: 31-34 units
(for students entering Level IV in **1991-92**)

R Geology 3S03 or 3F03; 4J03, 4T03; Physics 4B04, 4K03; one of Physics 3G03 or 3S03, whichever not already completed; 6 additional units of Level III or IV Geology or Physics.

E 6 to 9 units. Geology 3A03 or 3B03 is strongly recommended.

GEOLOGY MAJOR

Admission:
Completion of **Natural Sciences I**, including one of Geology 1A03 or 1C03, Mathematics 1A06 or 1C06, Chemistry 1A06, and one of Physics 1A06, 1B06, or 1C06. A grade of at least C must be obtained in Geology 1A03 or 1C03 and one other course listed.

Programme Notes:

1. Geology 2D06 will be included in calculating the Graduation Average.
2. Geology 3E02 is normally taken at the end of Level II. This course is scheduled outside of the regular term.
3. Materials 3D03, a prerequisite to Geology 4B03, should be taken in Level III.

Area Courses:
All Geology courses above Level I except Geology 2E01 and 3E02.

Level II: 31 units

R Geology 2B06, 2C03, 2DD3, 2E01, 2I03, 2J03; Chemistry 2P06; Biology 2E03.

E 6 units, excluding Geology.

Level III: 30 units (1989-90)

R Geology 2DD3, 3C06, 3DD3, 3E02, 3G04.

E 12 units, 6 of which may not be Geology. Chemistry 2W03 is strongly recommended.

Level III: 32 units
(for students entering Level III in **1990-91**)

R Geology 3CC6, 3DD3, 3E02, 3F03, 3G03, 3J03, 3Q03.

E 9 units, 3 of which may not be Geology. Geology 3S03 must be completed in Level III or IV. Chemistry 2W03 is strongly recommended.

Level IV: 30 units (1989-91)

R Geology 2J03, 3J03, 4B03 or 4BB3, 4E06 or 4K06, 4M03 and 4MM3.

E 9 units.

Level IV: 30 units
(for students entering Level IV in **1991-92**)

R Geology 4T03; 9 units of Level IV Geology; Geology 3S03, if not taken previously.

E 15 to 18 units, 3 of which may not be from Geology.

GEOLOGY AND PHYSICS MAJOR

Admission:
Completion of **Natural Sciences I**, including one of Geology 1A03 or 1C03, Physics 1A06, Chemistry 1A06, Mathematics 1A06 and 1B03 with a grade of at least C in each of Geology 1A03 or 1C03 and Physics 1A06. Students will also be considered for admission if they have completed Physics 1B06, or 1C06; however, Physics 1A06 is strongly recommended.

Programme Notes:

1. Geology 2D06 will be included in calculating the Graduation Average.
2. Geology 3E02 is normally taken at the end of Level II. This course is scheduled outside of the regular term.

Area Courses:
All Level II Geology courses except Geology 2E01; Physics 2B06, 2G03, and all Levels III and IV Geology and Physics courses, except Geology 3E02.

Level II: 34 units

R Geology 2B06, 2C03, 2DD3, 2E01, 2I03; Physics 2B06, 2G03; Mathematics 2G03, 2O03.

E 3 units excluding Physics and Geology. Computer Science 1MA3 is strongly recommended.

Level III: 32 units (1989-90)

R Geology 3A03 or 3B03; Geology 3C06, 3E02; Physics 2H03 or Chemistry 2P06; Physics 3G03 or 3S03; 3 units of Geology or Physics.

E 6 to 9 units to make a total of 32 units.

Level III: 32 units
(for students entering Level III in **1990-91**)

R Geology 3CC6, 3DD3, 3E02; Physics 2H03 or Chemistry 2P06; Physics 3O03; Physics 3G03 or 3S03; 3 units of Geology or Physics.

E 6 to 9 units. Geology 3A03 or 3B03 is strongly recommmended.

Level IV: 30 units (1989-90)

R Geology 3A03 or 3B03, whichever not already completed; Geology 2DD3, 3DD3; Physics 3G03 or 3S03, whichever not already completed; 9 units of Level III or IV Geology or Physics, of which 6 units must be Level III or IV Physics.

E 9 units.

Level IV: 30 units (1990-91)

R Geology 2DD3, 3DD3; 3A03 or 3B03, whichever not already completed; Physics 3G03 or 3S03, whichever not already completed; 9 units of Level III or IV Geology or Physics, of which 6 units must be Level III or IV Physics.

E 9 units.

Level IV: 30 units
(for students entering Level IV in **1991-92**)

R One of Geology 3A03, 3B03 or 4J03; 3S03 or 3F03; 4T03; one of Physics 3G03 or 3S03, whichever not already completed; 9 units of Level III or IV Geology or Physics, of which 6 units must be Level III or IV Physics.

E 9 units.

B.Sc. IN GEOLOGY

Admission:
Completion of **Natural Sciences I** including one of Geology 1A03 or 1C03, Chemistry 1A06 and Mathematics 1A06 or 1C06, with a grade of at least C– in Geology 1A03 or 1C03.

Programme Note:
Geology 3E02 is normally taken at the end of Level II. This course is scheduled outside of the regular term.

Area Courses:
All Geology courses above Level I except Geology 2E01 and 3E02.

Level II: 31 units

R Geology 2B06, 2C03, 2DD3, 2E01; Biology 2E03.

E 15 units, at least 6 of which may not be Geology. Chemistry 2P06 is strongly recommended.

Level III: 30 units (1989-90)

R Geology 2DD3, 3DD3, 3C06; 2J03 and 3J03, or 3G04; Geology 3E02.

E 10 to 12 units, 6 of which may not be from Geology. Geology 2J03 and 3J03, or 3G04, whichever not already completed as an R-group course is strongly recommended.

Level III: 29 units
(for students entering Level III in **1990-91**)

R Geology 3CC6, 3DD3; 3J03 or 3G03; 3S03 or 3F03; 3E02.

E 12 units, 6 of which may not be from Geology. Geology 3J03 or 3G03, whichever not already completed as an R-group course is strongly recommended.

Materials Science and Engineering

HONOURS MATERIALS SCIENCE

Admission:
Completion of **Natural Sciences I**, including Mathematics 1A06 and 1B03, Chemistry 1A06, and Physics 1A06 with a weighted average of at least 7.0 in Chemistry 1A06 and one of Mathematics 1A06, 1B03, or Physics 1A06.

Programme Notes:

1. Attention is drawn to Materials 4A01, which requires a report based on employment in the summer between Levels III and IV.
2. Students must select a minimum of 36 units of Level III and IV Area courses.

Area Courses:
All Ceramics, Materials and Metallurgy courses; Chemistry 2P06, 2T06; Engineering 2O03, 3Q03, and 4J03; Mathematics 2A06, 2C03, 2G03, and 2O03.

Levels II & III: 66 units

R Chemistry 2P06; Computer Science 1MA3 (unless 1B03 completed); Mathematics 2G03, 2O03, 3C03, 3D03; Engineering 2O03 (unless Materials 1A06, or 1A03 and 1B03 completed); Engineering 2P04 or 2R04; Materials 2C04, 2F03, 3B04, 3D06, 3E06; Physics 2B06; Physics 3M03, 3MM3 or Chemistry 3U03.

E Electives to make a minimum of 66 units.

Level IV: 30 units

R Materials 4A01, 4E03, 4K04, 4L04; 12 units of technical electives chosen from Area courses or Chemical Engineering 4B03; Engineering Physics 4E03, 4F03, 4Z03; Mechanical Engineering 3O04; Physics 4K03; Statistics 2M03 or 3N03.

E 6 units, which may not be selected from courses in Ceramics, Chemistry, Computer Science, Engineering Physics, Mathematics, Materials, Metallurgy, Physics or Statistics.

MATERIALS SCIENCE MAJOR

Admission:
Completion of **Natural Sciences I**, including Mathematics 1A06 and 1B03, and Chemistry 1A06 with a weighted average of at least 5.0 in Mathematics 1A06 and Chemistry 1A06. Physics 1A06 must be taken in Level I or II; its election in Level I is strongly recommended.

Programme Notes:

1. Attention is drawn to Materials 4A01, which requires a report based on employment in the summer between Levels III and IV.
2. Students must select a minimum of 36 units of Level III and IV Area courses.

Area Courses:
All Ceramics, Materials and Metallurgy courses; Chemistry 2P06, 2T06; Engineering 2O03, 3Q03, and 4J03; Mathematics 2A06, 2C03, 2G03, and 2O03.

Levels II & III: 60 units

R Chemistry 2P06; Computer Science 1MA3 (unless 1B03 completed); Mathematics 2G03, 2O03, 3V06; Enginneering 2O03 (unless Materials 1A03 and 1B03 completed); Engineering 2P04 or 2R04; Materials 2C04, 2F03, 3B04, 3D06, 3E06; Physics 1A06 (unless completed), 2B06.

E Electives to make a minimum of 60 units.

Level IV: 30 units

R Materials 3P03, 4A01, 4E03, 4L04; nine units of technical electives chosen from Area courses or Chemical Engineering 4B03; Engineering Physics 4E03, 4F03, 4Z03; Mechanical Engineering 3O04; Physics 4K03; Statistics 2M03 or 3N03.

E Electives to make a total of 30 units, at least 6 units of which are not to be selected from courses in Ceramics, Chemistry, Computer Science, Engineering, Physics, Mathematics, Materials, Metallurgy, Physics or Statistics.

Department of Mathematics and Statistics

HONOURS COMPUTER SCIENCE AND COMPUTER SCIENCE MAJOR AND B.SC. IN COMPUTER SCIENCE

(See *Computer Science and Systems*)

HONOURS COMPUTER SCIENCE AND MATHEMATICS, AND COMPUTER SCIENCE AND MATHEMATICS MAJOR

(See *Computer Science and Systems*)

HONOURS COMPUTER SCIENCE AND STATISTICS AND COMPUTER SCIENCE AND STATISTICS MAJOR

(See *Computer Science and Systems*)

HONOURS ECONOMICS AND MATHEMATICS (B.A.)

(see *Faculty of Social Sciences, Department of Economics*)

HONOURS PHILOSOPHY AND MATHEMATICS (B.A.)

(See *Faculty of Humanities, Department of Philosophy*)

HONOURS ARTS AND SCIENCE AND MATHEMATICS (B.Arts Sc.)

(See *Arts and Science Programme*)

HONOURS MATHEMATICS (common Level II programme)

Admission:
Completion of **any Level I** programme, with a weighted average of at least 7.0 in Mathematics 1A06 or 1C06 and 1B03, and 6 units acceptable to the Department of Mathematics and Statistics.

For students intending to enter Honours Computer Science and Mathematics, or Honours Computer Science and Statistics, Computer Science 1MA3 and 1MB3 are required in Level I.

Programme Notes:

1. This is a common Level II Programme from which the student, by a suitable selection of required and elective courses, may enter the Honours programmes in Computer Science, Computer Science and Mathematics, Computer Science and Statistics, Mathematics, and Statistics.
2. **Choice of required courses and electives:** Students should carefully choose their required and elective courses to be eligible for the programme of choice.

   For the **Computer Science** Programme **and the joint programme** with Computer Science, the student must take Computer Science 2MC3, 2MD3.

   Students interested in **Statistics** must take Statistics 2D03 and should take Statistics 2M03. A course in Computer Science is recommended.

   Students interested in **Mathematics** should take Mathematics 2C03 and 2F03.
3. All computer Science Courses except for the final year project courses are open to any student who has the specified prerequisite.
4. The Department of Mathematics and Statistics requires that all Honours students entering Level III or IV must have their programmes approved by the Chairman or designate.

Area Courses:
Computer Science 2MC3, 2MD3; Mathematics 2A06, 2B06, 2C03, 2E03, 2F03; Statistics 2D03, 2M03; Physics 2C05.

Level II: 30 units

R Mathematics 2A06, 2B06; 9 units of Area courses.

E 9 units.

HONOURS MATHEMATICS

Admission:
Completion of **Level II Honours Mathematics**, including Mathematics 2C03 or **Level II Honours Computer Science**, including Mathematics 2A06 and 2B06.

Area Courses:
Mathematics 2C03, 2F03; all Level III and IV Mathematics and Statistics courses.

The following Area Courses are recommended for those who wish to pursue a career in Mathematics: Mathematics 3F03, 3FF3, 3H03, 3P03, 3L06, 4B06, 4E03, 4I03, 4K03, 4V03.

Levels III and IV: 60 units

R Mathematics 2C03 (must be completed by the end of Level III); Mathematics 3A06, 3B03, 3E03, 3EE3, 4A06; 21 units of Area courses.

E Electives to make a total of 60 units, at least 6 of which must not be from the Department of Mathematics and Statistics.

HONOURS MATHEMATICS AND PHYSICS

Admission:
Completion of **Natural Sciences I**, including Mathematics 1A06 or 1C06; 1B03; Physics 1A06 and Chemistry 1A06, with a weighted average of at least 7.0 in the Physics and Mathematics courses. It is also mended that Computer Science 1B03 or 1MA3 be taken in Level I.

Programme Note:
Students who complete Level II of Honours Mathematics and Physics are eligible to proceed to any Level III Honours programme in Mathematics or Physics.

Area Courses:
Mathematics 2A06, 2B06, 2C03, 2E03, 2F03; Statistics 2D03; all Level III and IV Mathematics and Statistics courses; Physics 2B06, 2C05, 2H03; all Level III and IV Physics courses *except* Physics 3G03, 3S03, 3T03, 4R03 and 4T03; Computer Science 2MC3, 2MD3.

Level II: 32 units

R Mathematics 2A06, 2B06, 2C03; Physics 2B06, 2C05, 2H03.

E 3 units

Levels III and IV: 61-62 units

R Mathematics 3A06, 3F03, 4A06; Physics 3K04, 3M03, 3MM3, 4B04, 4C03; 17 to 18 units of Area courses.

E 12 units

HONOURS STATISTICS

Admission:
Completion of **Level II Honours Mathematics**, including Statistics 2D03 or **Level II Honours Computer Science**, including Mathematics 2A06 and 2B06. Students are strongly urged to complete Computer Science 1B03 or 1MA3, or 1H03 or 1ZA3 before entering Level III.

Area Courses:
Computer Science 2MC3, 2MD3, 2ME3, 2SB3, 3A03, 3IA3, 3P03, 3SC3; Mathematics 2C03, 2C04, 2E03, 3A06, 3E03, 3EE3, 3F03, 3FF3, 3O06, 3Q03, 3Q04, 3R03, 3S03, 3T03, 3W03, 3X03, 3Y03, 4A06, 4C03, 4G03, 4J03, 4K03, 4O06, 4Q03, 4RR3, 4W03; all Level III and IV Statistics courses.

Levels III and IV: 60 units

R Mathematics 2C03 (must be completed by the end of Level III), and 3A06 or 3O06, 3T03; Statistics 3D06, 2M03 or 3M03 (if not completed), 4M03; 9 units of Statistics Area Courses; 15 units of Area Courses.

E Electives to make a total of 60 units, of which at least 6 units must not be from courses in the Department of Mathematics and Statistics.

MATHEMATICS MAJOR (common Level II programme)

Admission:
Completion of **any Level I** programme, with an average of at least 5.0 in Mathematics 1A06 or 1C06, and 1B03, and 6 units acceptable to the Department of Mathematics and Statistics.

Students with a weighted average of at least 10.0 in Mathematics 2G03, 2J06 and 2O03 in Level II Mathematics may be permitted to transfer to Honours Mathematics in Level III.

For students intending to enter Computer Science Major, Computer Science and Mathematics Major, or Computer Science and Statistics, Computer Science 1MA3 and 1MB3 are required in Level I.

Programme Notes:

1. This is a common Level II Programme from which the student, by a suitable selection of required and elective courses, may enter the major programmes in Computer Science, Computer Science and Mathematics, Computer Science and Statistics, Mathematics, Statistics.
2. **Choice of required courses and electives:** Students should carefully choose their required and elective courses to be eligible for the programme of choice.

   For the **Computer Science** programme **and the joint programme** with Computer Science, the student must elect Computer Science 2MC3 and 2MD3.

   Students interested in **Statistics** must take Statistics 2D03 and should take Statistics 2M03. A course in Computer Science is recommended.

Area Courses:
Computer Science 2MC3, 2MD3, 2ME3, 2SB3; Mathematics 2E03, 2G03, 2J06, 2K03, 2O03; Statistics 2D03, 2M03.

Level II: 30 units

R Mathematics 2G03, 2J06, 2O03; one of Statistics 2D03, 2M03.

E Electives to make a total of 30 units, at least 6 of which must not be from the Department of Mathematics and Statistics.

MATHEMATICS MAJOR

Admission:
Completion of **Level II Mathematics Major**, including Statistics 2D03, or **Level II Computer Science Major** including Mathematics 2G03 and 2O03.

Area Courses:
All Levels III and IV Mathematics and Statistics courses.

Levels III and IV: 60 units

R Mathematics 3O06, 3T03, 4O03, and one of Mathematics 3B03, 3F03, 3H03, 3E03; 18 units of Area courses.

E Electives to make a total of 60 units, at least 6 of which must not be from the Department of Mathematics and Statistics.

STATISTICS MAJOR

Admission:
Completion of **Level II Mathematics Major**, including Statistics 2D03, or **Level II Computer Science Major** including Mathematics 2G03 and 2O03. Students are strongly urged to complete Computer Science 1B03 or 1MA3, or 1H03 or 1ZA3 before entering Level III.

Area Courses:
Computer Science 2MC3, 2SB3, 3I03, 3D03, 3P03, 3SC3, 3T03, 4I03, 4W03; Mathematics 3O06, 3Q03, 3R03, 3S03, 3T03, 3X03, 3Y03, 4C03, 4C04, 4G03, 4J03, 4O03, 4Q03, 4RR3, 4W03; Statistics 2M03; all Level III and IV Statistics courses.

Levels III and IV: 60 units

R Mathematics 3O06, 3T03, 4O03; Statistics 3D06, 2M03 or 3M03 (if not completed); 9 units of Statistics Area courses; 9 units of Area courses.

E Electives to make a total of 60 units at least 6 of which must not be from the Departments of Mathematics and Statistics.

B.Sc. IN MATHEMATICS

Admission:
Completion of **any Level I Programme**, with a weighted average of at least 4.0 in Mathematics 1A06 or 1C06, and Mathematics 1B03.

Area Courses:
Mathematics 2E03, 2G03, 2J06, 2K03, 2O03; Computer Science 2ME3, 2P03, 3P03; Statistics 2D03, 2M03; all Level III Mathematics and Statistics courses.

Levels II and III: 60 units

R Mathematics 2G03, 2J06, 2O03, 3O06; one of Mathematics 3B03, 3E03, 3T03; 6 units of Area courses.

E Electives to make a total of 60 units, at least 12 units of which must not be from the Department of Mathematics and Statistics.

Molecular Biology and Biotechnology

HONOURS MOLECULAR BIOLOGY AND BIOTECHNOLOGY

This Honours degree programme is administered within the Faculty of Science, jointly by the Departments of Biochemistry, Biology and Pathology, through a Committee of Instruction. The programme also draws on the McMaster Institute for Molecular Biology and Biotechnology. Information and counselling may be obtained from the Programme Co-ordinator, Dr. S.T. Bayley in the Department of Biology.

Admission:
Completion of **Natural Sciences I** including Biology 1A06, Chemistry 1A06, one of Physics 1A06, 1B06, or 1C06, with at least a B– in Biology 1A06, Chemistry 1A06, and in one of Mathematics 1A06, 1C06 or Physics 1A06, 1B06, 1C06. The inclusion of Computer Science 1MA3 or 1ZA3 in Level I is strongly recommended.

Programme Note:
Level IV programme registrations must be approved by the Programme Co-ordinator for Molecular Biology and Biotechnology.

Area Courses:
Biochemistry 2A03, 3A06, 3B03, 3C03, 3G06, 4B06, 4I03, 4M03, 4P03, 4Q03; Biology 2B03, 2C03, 2D03, 2E03, 3E03, 3H03, 3HH3, 3N06, 3O03, 4B03, 4C08, 4F04, 4H03, 4I03, 4V03; Chemistry 2B06, 2N03, 2O06, 2Q06, 3D03; Molecular Biology 3A06, 4A03, 4B03, 4C03, 4D03, 4E03, 4F03, 4G03.

Level II: 30 units

R Biochemistry 2A03; Biology 2B03, 2C03; Chemistry 2O06, 2Q06; Computer Science 1MA3 or 1ZA3 (if not completed); one of Biology 2D03, 2E03, Chemistry 2N03.

E 3 to 6 units. Biology 2D03, 2E03, Chemistry 2N03 are recommended if not taken in the R group.

Level III: 30 units

R Biochemistry 3A06 or 3G06 (if Biochemistry 2A03 not completed); Molecular Biology 3A06; Biology 3H03, 3N06, 3O03; Chemistry 3D03.

E 3 units.

Level IV: 30-32 units

R Either Molecular Biology 4A03 and one of Biochemistry 4P03, Biology 4F04, or one of Biochemistry 4B06, Biology 4C08; Molecular Biology 4B03, 4C03, 4D03; 9 units chosen from Biochemistry 4I03, 4M03, 4Q03; Biology 4H03, 4I03, 4V03; Molecular Biology 4E03, 4F03, 4G03.

Students who have opted in either Biochemistry 4B06 or Biology 4C08 for a thesis topic which is outside the Molecular Biology discipline will be required to take Molecular Biology 4A03.

E 6 units.

Department of Physics

HONOURS CHEMISTRY AND PHYSICS

(See *Department of Chemistry*)

HONOURS GEOLOGY AND PHYSICS

(See *Department of Geology*)

HONOURS MATHEMATICS AND PHYSICS

(See *Department of Mathematics and Statistics*)

HONOURS ARTS AND SCIENCE AND PHYSICS (B.Arts Sc.)

(See *Arts and Science Programme*)

HONOURS PHYSICS

Admission:
Completion of **Natural Sciences I**, including Mathematics 1A06 and 1B03, Physics 1A06 and Chemistry 1A06, with a weighted average of at least 7.0 in the Physics and Mathematics courses. Students will also be considered for admission if they have completed Physics 1B06 or 1C06, instead of 1A06. However, Physics 1A06 is strongly recommended. It is also recommended that Computer Science 1MA3 be taken in Natural Sciences I.

Programme Note:
Students who have completed Level II of Honours Physics are eligible to proceed to Level III of Honours Physics, and Honours Applied Physics. They may also be considered for admission to Level III of Honours Materials Science, preferably if Materials 1A06 or 1A03 and 1B03, or Engineering 2O03, has been completed in Level II.

Area Courses:
Physics 2B06, 2C05, 2H03, 3A03, 3B06, 3H04, 3K04, 3M03, 3MM3, 3M06, 3N03, 3X03, 3Y03, 4A02, 4B04, 4C03, 4D06, 4E03, 4F03, 4G03, 4J04, 4K03, 4U03; Mathematics 2A06, 3C03, 3D03.

Level II: 32-35 units

R Physics 2B06, 2C05, 2H03; Mathematics 2A06, 2C03; Computer Science 1MA3 (if 1B03 not completed).

E Electives to make a total of 32 to 35 units, at least 6 of which must not be from Physics.

Level III: 32-35 units

R Physics 3H04, 3K04, 3M03, 3MM3, 3N03; Mathematics 3C03, 3D03; 3 to 6 units of Level III or IV courses from the Faculty of Science. At least one of Physics 3B06 or 4D06 must be completed in either Level III or IV. Students will generally find that more choices are offered by the timetable if Physics 3B06 is taken in Level III and if Physics 4D06 is taken in Level IV.

E 6 units, excluding Physics and Engineering Physics.

Level IV: 31-34 units

R Physics 4A02, 4B04, 4F03, 4J04; two of Physics 3A03, 3X03, 3Y03, 4C03, 4D06, 4E03, 4K03; 6 units of Level III or IV courses from the Faculty of Science.

E Electives to make a total of 31 to 34 units.

HONOURS PHYSICS (THEORY OPTION)

Admission:
Completion of **Level II Honours Physics** or **Level II Honours Mathematics and Physics**.

Area Courses:
Applicable Level II Area courses; Physics 3A03, 3H04, 3K04, 3M03, 3MM3, 3N03, 3X03, 3Y03, 4A02, 4B04, 4C03, 4E03, 4F03, 4G03, 4K03, 4Q04, 4U03; Mathematics 3C03, 3D03, 3Q03, 4O03, 4V03.

Level III: 32-35 units

R Mathematics 3C03, 3D03, 3Q03; Physics 3H04, 3K04, 3M03, 3MM3, 3N03, 4C03 (if offered). **NOTE:** Physics 4C03, which is offered in alternate years, must be taken in Level III or Level IV.

E 6 to 9 units, at least 3 of which must be from outside of Physics and Engineering Physics.

Level IV: 31-34 units

R Mathematics 4O03; Physics 4A02, 4B04, 4C03 (if not completed), 4F03; 9 units from Physics 3A03, 3X03, 3Y03, 4E03, 4G03, 4K03, 4U03; 6 units of Level III or IV courses from the Faculty of Science. **NOTE:** Physics 4C03, which is offered in alternate years, must be taken in Level III or Level IV.

E Electives to make a total of 31 to 34 units.

HONOURS APPLIED PHYSICS

Admission:
Completion of **Level II Honours Physics**, or **Level II Honours Mathematics** including Physics 2B06 and 2C05.

Area Courses:
Applicable Level II Area courses; Physics 3B06, 3H04, 3M03, 3MM3, 3M06, 4A02, 4B04, 4D06, 4J04; Mathematics 3C03, 3D03; Engineering Physics 4W03.

Level III: 34-36 units

R Physics 3B06, 3H04, 3M03, 3MM3, 2H03 (if not completed); Mathematics 3C03, 3D03; additional units chosen from Physics 3K04, 3N03, 3T03, 3X03, 3Y03, Engineering Physics 3D03, 3X04, Mathematics 3Q03 to make a total of 28 to 30 units.

E 6 units, excluding Physics and Engineering Physics.

Level IV: 32-34 units

R Physics 4A02, 4B04, 4D06, 4J04; Engineering Physics 4W03; 6 to 8 units of Level III or IV Physics or Engineering Physics.

E Electives to make a total of 32 to 34 units.

HONOURS APPLIED PHYSICS (HEALTH AND RADIATION OPTION)

Admission:
Completion of **Natural Sciences I**, including Mathematics 1A06 and 1B03, Physics 1A06, Chemistry 1A06, and one of Biology 1A06, Computer Science 1MA3, with a weighted average of at least 7.0 in the Physics and Mathematics courses. Students will also be considered for admission if they have completed Physics 1B06 or 1C06, instead of 1A06. However, Physics 1A06 is strongly recommended. It is also recommended that Computer Science 1MA3 be taken in Natural Sciences I.

Area Courses:
Physics 2B06, 2C05, 2H03, 3H04, 3M03, 3MM3, 3M06, 3T03, 4A02, 4B04, 4D06, 4E03, 4Q04, 4R03, 4T03; Mathematics 2A06, 3C03, 3D03; Biology 3Q03.

Level II: 32-35 units

R Physics 2B06, 2C05, 2H03; Mathematics 2A06, 2C03; Computer Science 1MA3 (if 1B03 not completed), and Biology 1A06 (if not completed); one of Computer Science 1MB3, 2SB3.

E Electives to make a total of 32 to 35 units. Chemistry 2D03 is strongly recommended.

Level III: 31-34 units

R Physics 3H04, 3M03, 3MM3, 3T03; Mathematics 3C03, 3D03; Biology 3Q03; two of Physics 3B06, Mathematics 3Q03, Chemistry 2F03.

E Electives to make a total of 31 to 34 units.

Level IV: 33-35 units

R Physics 4A02, 4B04, 4D06, 4E03, 4Q04, 4R03, 4T03; Engineering Physics 4W03; one of Engineering 4X03, Engineering Physics 4Y03. The project of Physics 4Q04 must be taken in the field of Health and Radiation Physics.

E Electives to make a total of 33 to 35 units.

HONOURS THEORETICAL PHYSICS AND APPLIED MATHEMATICS

Programme Note:
This programme is being discontinued. Level III will be last offered in 1989-90. Alternate Programmes are Honours Physics (Theory Option) and Honours Mathematics and Physics. (See *Department of Mathematics and Statistics*).

Area Courses:
Applicable Level II Area courses; Physics 3K04, 3M06, 4A02, 4B04, 4C03, 4F03; Mathematics 3A06, 3C03, 3D03, 3O06, 3T03, 4A06, 4D03, 4O03, 4V03.

Level III: 31-34 units

R Mathematics 3C03, 3D03; one of Mathematics 3A06, 3O06; Physics 3K04, 3M03, 3MM3, 4C03 (in 1989-90), 2H03 (if not completed); 3 to 6 units from Physics 3A03, 3N03, 3X03, 3Y03, Mathematics 3Q03.

E Electives to make a total of 31 to 34 units.

Level IV: 33-36 units

R Mathematics 3Q03 (if not completed), 4V03, Physics 4A02, 4B04, 4C03 (if not completed), 4F03; Mathematics 4A06 or 4B06 or 4O03; 3 to 9 units of Level III or IV Mathematics or Physics.

E Electives to make a total of 33 to 36 units.

PHYSICS MAJOR (GENERAL OPTION)

Admission:
Completion of **Natural Sciences I**, including Mathematics 1A06 and 1B03, Physics 1A06, and Chemistry 1A06 with a weighted average of at least 5.0 in the Physics and Mathematics courses. Students will also be considered for admission if they have completed Physics 1B06 or 1C06 instead of 1A06. However, Physics 1A06 is strongly recommended. It is also recommended that Computer Science 1MA3 be taken in Natural Sciences I.

Area Courses:
Physics 2B06, 2C05, 2G03, 2H03, and all Levels III and IV Physics courses; Mathematics 2G03, 2O03; Engineering Physics 3D03, 3F03, 4D03, 4E03, 4F03, 4G03, 4K03, 4N03, 4S04, 4W03.

Level II: 30-32 units

R Physics 2B06, 2H03; one of 2G03, 2C05; Mathematics 2G03, 2O03; Computer Science 1MA3 (if 1B03 not completed).

E Electives to make a total of 30 to 32 units, at least 6 of which must not be Physics.

Level III: 29-32 units

R Physics 3H04; **either** Physics 3M03 and 3MM3, and Mathematics 3C03 and 3D03, and 3 to 4 units from Levels III and IV Physics, **or** Physics 3O03, 3Q03, and Mathematics 3C03, and 6 to 7 units from Levels III and IV Physics.

E Electives to make a total of 29 to 32 units, at least 6 of which must not be from Physics or Engineering Physics.

Level IV: 30-32 units

R Physics 4A02, 4J04; 8 to 10 units of Level III and IV Physics which must include one of Physics 3B06 or 4D06 if neither has been completed; 6 units of Level III or IV Area courses.

E Electives to make a total of 30 to 32 units.

PHYSICS MAJOR (HEALTH AND RADIATION PHYSICS OPTION)

Admission:
Completion of **Natural Sciences I**, including Mathematics 1A06 and 1B03, Physics 1A06, Chemistry 1A06, one of Biology 1A06, Computer Science 1MA3, with a weighted average of at least 5.0 in Physics, one of the Mathematics courses, and any one other required course. Students will also be considered for admission if they have completed Physics 1B06 or 1C06, instead of 1A06. However, Physics 1A06 is strongly recommended.

Area Courses:
Physics 2B06, 2C05, 2G03, 2H03 and all Levels III and IV Physics courses; Mathematics 2G03, 2O03; Biology 3Q03; Engineering 4X03; Engineering Physics 4Y03.

Level II: 30-32 units

R Physics 2B06, 2H03; one of 2C05, 2G03; Mathematics 2G03, 2O03; Computer Science 1MA3 (if 1B03 not completed), and Biology 1A06 if not completed; one of Computer Science 1MB3, 2SB3.

E Electives to make a total of 30 to 32 units. Chemistry 2D03 is strongly recommended.

Level III: 31-34 units

R Physics 3B06, 3H04, 3O03, 3Q03, 3T03; Mathematics 3C03; Biology 3Q03; Chemistry 2F03.

E Electives to make a total of 31 to 34 units.

Level IV: 30-32 units

R Physics 4A02, 4D06, 4E03, 4Q04, 4R03, 4T03; one of Engineering 4X03, Engineering Physics 4Y03. The project of 4Q04 must be taken in the field of Health and Radiation Physics.

E Electives to make a total of 30 to 32 units.

B.Sc. IN PHYSICS

Admission:
Completion of **Natural Sciences I**, including Physics 1A06, Mathematics 1A06 and 1B03, Chemistry 1A06, with at least C− in Physics. Students will also be considered for admission if they have completed Physics 1B06 or 1C06, instead of 1A06. However, Physics 1A06 is strongly recommended. It is also recommended that Computer Science 1MA3 be taken in Natural Sciences I.

Area Courses:
Physics 2B06, 2G03, 2H03 and all Levels III and IV Physics courses; Mathematics 2G03; Chemistry 2P06.

Level II: 30 units
R Physics 2B06, 2G03; either Physics 2H03 or Chemistry 2P06; Mathematics 2G03, 2O03; Computer Science 1MA3 (if 1B03 not completed).
E Electives to make a total of 30 units, at least 6 of which must not be from Physics.

Level III: 29-31 units
R Physics 3H04, 3O03; 6 to 9 units of Levels III and IV Physics.
E Electives to make total of 29 to 31 units, at least 6 of which must not be from Physics or Engineering Physics.

Department of Psychology

HONOURS PSYCHOLOGY (B.A.) AND MAJOR PSYCHOLOGY (B.A.) AND B.A. IN PSYCHOLOGY

(See *Faculty of Social Sciences, Department of Psychology.*)

HONOURS BIOLOGY AND PSYCHOLOGY (B.Sc.)

(See *Department of Biology*)

HONOURS COMPUTER SCIENCE AND PSYCHOLOGY (B.Sc.)

(See *Department of Computer Science and Systems*)

HONOURS ARTS AND SCIENCE AND PSYCHOLOGY (B. Arts Sc.)

(See *Arts and Science Programme*)

HONOURS PSYCHOLOGY (B.Sc.)

Admission:
Completion of **Natural Sciences I**, with a grade of at least B− in Psychology 1A06, and a grade of a least B− in 6 additional units of Biology, Chemistry, Physics, or Mathematics.

Programme Notes:

1. At some time during the programme, the student must meet a laboratory requirement by completing one of Psychology 3C06, 3E03, 3L03 (formerly 2U03), 3QQ3, 3S03, 3V03, 4G03, or 4QQ3.
   Enrolment in Psychology Laboratory courses is limited. Permission of the department is required by March 1.
2. Students who entered this programme **prior to September 1988**, must complete *either* Psychology 2E03 or 3W06.
   Students who entered this programme **in September 1988**, must complete Psychology 2E03.
3. The electives taken during Levels III and IV must include a minimum of 6 units which are *not* Psychology.

Area Courses:
Psychology 2E03, 2H03, 2R06, 2T03; All Level III and IV Psychology courses .

Level II: 30 units
R Psychology 2E03, 2H03, 2R06, 2T03; one of English 1D06, 3A03; 9 units chosen from Biochemistry, Biology, Chemistry, Physics, Mathematics and Statistics, Computer Science.
E Electives to make a total of 30 units, only 3 of which may be from Psychology. Psychology 3L03 may be taken in Level II.

Level III: 30 units
R 18 units of Level III Psychology; 6 units chosen from Levels III and IV Biochemistry, Biology, Chemistry, Physics, Mathematics and Statistics, or Computer Science.
E 6 units. (See *Programme Notes* above.)

Level IV: 30 units
R Psychology 4D06; 12 units of Levels III or IV Psychology.
E 12 units. (See *Programme Notes* above.)

PSYCHOLOGY MAJOR (B.Sc.)

Admission:
Completion of **Natural Sciences I** with at least a grade of C in Psychology 1A06 and in 6 additional units of Science courses.

Programme Notes:

1. At some time during the programme the student must meet a laboratory requirement by completing one of: Psychology 3C06, 3E03, 3L03 (formerly 2U03), 3QQ3, 3S03, 3V03, 4G03.
   Enrolment in Psychology laboratory courses is limited. Permission of the Department is required by March 1.
2. All area courses from Levels II, III and IV will be included in calculating the Graduation Average.

Area Courses:
Psychology 2E03, 2H03, 2T03, 2R06; All Level III and IV Psychology courses *except* Psychology 3Z03 and 4D06.

Level II: 30 units
R Psychology 2R06; 6 units from Psychology 2E03, 2H03, 2T03; 3 additional units of Level II Psychology; English 1D06; 9 units Natural Sciences excluding Psychology.

Level III: 30 units
R 12 units Level III Psychology; 6 units Humanities or Social Science; 12 units Natural Sciences excluding Psychology; at least 6 units of which must be Level III or IV courses.

Level IV: 30 units
R 12 units Level III or IV Psychology; 6 units Humanities or Social Sciences; 12 units Level III or IV Natural Sciences courses excluding Psychology.

B.Sc. IN PSYCHOLOGY

Admission:
Completion of **Natural Sciences I**, with a grade of at least C− in Psychology 1A06.

Programme Notes:

1. At some time during the programme, the student must meet a laboratory requirement by completing one of Psychology 3C06, 3E03, 3L03 (formerly 2U03), 3QQ3, 3S03, or 3V03.
   Enrolment in Psychology laboratory courses is limited. Permission of the department is required by March 1.

Area Courses:
Psychology 2D06, 2E03, 2H03, 2R06, 2T03; All Level III and IV Psychology courses.

Level II: 30 units
R 6 units from Psychology 2D06, 2E03, 2H03, 2T03; Psychology 2R06; one of English 1D06 or 3A03; 6 units chosen from Biochemistry, Biology, Chemistry, Mathematical Sciences or Physics.
E 6 to 9 units, at least 3 of which must not be from Psychology. Psychology 3L03 may be taken in Level II.

Level III: 30 units
R 12 units of Level III Psychology; 6 units beyond Level I chosen from Biochemistry, Biology, Chemistry, Mathematics and Statistics, Computer Science or Physics.
E 12 units, at least 6 of which must not be from Psychology.

Science

B.Sc. IN SCIENCE

For students who enter this programme **from September 1987** the following will prevail.

Admission:
Completion of **Natural Sciences I**, including Mathematics 1A06 or 1C06, and two of Chemistry 1A06, Physics 1A06, 1B06, 1C06, Biology 1A06, Psychology 1A06 with an average of at least 4.0 in two of the specified courses. Chemistry 1A06, one of Physics 1A06, 1B06, 1C06,

one of Biology 1A06 or Psychology 1A06, and one of Geography 1A06, Geology 1A03, 1C03 must be completed before Level III. The completion of all the requirements in Level I is strongly recommended.

Programme Notes:

1. ★ Science Courses: Courses referred to as *Science Courses* and marked with ★ are those courses offered by the Departments of Biochemistry, Biology, Chemistry, Computer Science and Systems, Geology, Materials Science and Engineering, Mathematics and Statistics, Physics, Psychology, and courses offered by the Department of Geography which are classified as Science courses.
2. No more than 24 units of the R- and E-group courses designated as Science Courses★ may be taken in any one department. No more than 12 units of Level I courses may be taken.

Area Courses:
All Level II and III Science Courses★.

Levels II and III: 60 units

R 18 units of Level II Science courses★, 12 units of Level III Science courses★, one of English 1D06, Humanities 1C03, Philosophy 1B06, 1D06; 6 additional units from the Faculties of Humanities or Social Sciences.

No more than 18 units of R-group courses may be taken in any one Department.

E 18 to 21 units to make a total of 60 units.

For students who entered this programme **before September 1987**, the following will prevail.

Programme Notes:

1. ★ Science Courses: Courses referred to as *Science Courses* and marked with ★ are those courses offered by the Departments of Biochemistry, Biology, Chemistry, Computer Science and Systems, Geology, Materials Science and Engineering, Mathematics and Statistics, Physics, Psychology, and courses offered by the Department of Geography which are classified as Science courses.
2. In Levels II and III combined, not more than 14 units of Level I work may be taken and not more than 18 units of R-group courses may be taken in any one Department.

Area Courses:
All Level II and III Science Courses★.

Level II: 30 units

R 18 units of Level II and III Sciences courses★, including a Level I Chemistry (if not completed) and a Level I Physics (if not completed).

E 12 units, at least 6 of which are not Area courses.

Level III: 30 units

R 18 units of Level II and III Science Courses★, at least 12 units of which must be from Level III.

E 12 units, at least 6 of which are not Area courses.

Faculty of Social Sciences

P.J. George/M.A., Ph.D., Dean of Social Sciences
W.K. Whillier/B.A., Ph.D., Associate Dean (Studies)
E. Frank/M.A., Academic Assistant to the Dean
A. Treadwell/B.S.W., M.A., Student Advisor
J. Weston/B.A., Student Advisor
E. Moore/Programmes Co-ordinator

The social sciences are concerned with the systematic study of activities and human relationships in societies which range from the primitive to the post-industrial. There is also growing interest among social scientists in the interaction between people and their natural and artificial environments. Developments in theory and refinements of method have, in recent years, given great impetus to social science studies and research.

The Faculty of Social Sciences includes the following departments or schools and programmes:

Anthropology, Economics, Gerontology, Labour Studies, Physical Education, Political Science, Religious Studies, Social Work, Sociology. Geography and Psychology have programmes in the Faculty of Social Sciences as well as in the Faculty of Science.

The Faculty offers Bachelor of Arts, Honours Bachelor of Arts and Professional programmes. It also offers a B.A. Major programme in Psychology. The Honours programmes provide a richer concentration in the particular field, as well as an extended time of study, and are normally a requirement for those who contemplate proceeding to graduate studies. In many cases, students may combine work in two departments and be graduated with a Combined Honours Degree in the two subjects. The Gerontology degree is offered *only* in combination with another subject, except when it is taken as a second degree. The Faculty of Social Sciences is participating fully in helping interested students combine concentration in a social science area with concentration in Arts and Science, or any discipline in the Faculty of Humanities.

The two schools, Social Work and Physical Education, offer programmes of study which lead to the B.A./B.S.W. degrees in the one case, and the B.P.E. degree in the other. The B.S.W. degree may be attained separately by those who have already received one undergraduate degree.

Students are strongly advised to take advantage of the extensive advisory services provided by the Faculty. New students in particular should plan a programme of study that will allow them a number of options for Level II.

Academic Regulations

Students enrolled in a programme in the Faculty of Social Sciences, in addition to meeting the Academic Regulations of the University, shall be subject to the following regulations of the Faculty of Social Sciences.

MCMASTER TEST OF WRITING COMPETENCE

A student admitted to McMaster University in 1986 or later who has completed 60 units of any programme, **must** also have passed the McMaster Test of Writing Competence, **before** continuing in any Social Sciences Programme. The intent of this regulation is to ensure that students pass the Test before registering in Level III of, or graduating from, any Social Sciences programme, and the regulation will be applied in accordance with this intent.

HUMANITIES REQUIREMENTS

Students registered in programmes in the Faculty of Social Sciences, except for those registered in the Bachelor of Physical Education programme and the B.A./B.S.W. programme, **are required** to complete 6 units of courses chosen from the Faculty of Humanities before graduation, preferably before Level II.

Students registered in B.A. programmes in Economics and Psychology will fulfill this requirement by completing the English requirement for their programme. Students in the B.A. Psychology programme should note the additional Science or Humanities requirements for that programme.

DEADLINES

The Faculty of Social Sciences will not consider applications for admission, admission to a second degree or continuing studies, registration, or dropping and adding of courses after the deadlines stated in this Calendar under *Application Procedures* and *Sessional Dates* unless written documentation is provided showing good cause, as determined by the Faculty Admissions, Study and Reviewing Committee.

COURSE SELECTION AND CHANGES

A student must ensure that the selection of courses meets the degree requirements for the programme in which the student is registered, that any prerequisites have been met, and that the appropriate written permission has been obtained if required. Considerable inconvenience can result for a student whose registration does not meet the requirements.

All registrations, programme changes and course changes must be approved by the Associate Dean (Studies) and are subject to the deadline dates established by the University as published in this Calendar under *Sessional Dates*.

Qualified students are permitted to transfer between B.A. and Honours programmes with the approval of the Associate Dean (Studies). Transfers are subject to the deadline dates established by the University.

COURSES IN PHYSICAL EDUCATION AND SOCIAL WORK AVAILABLE FOR UNDERGRADUATE CREDIT

Several courses offered by the School of Physical Education and the School of Social Work may be taken by students in B.A. programmes as electives for undergraduate credit. Enrolment in these courses requires written permission of the instructor. These courses are:

Physical Education 3J03, 3P03, 3Q03, 3SS3, 4E03, 4G03, 4J03, 4L03, 4M03, 4Q03

Social Work 3C03, 3G03, 3H03, 3J03, 4J03, 4M03.

RE-ADMISSION

A student who is ineligible to continue at the University may apply for re-admission to the Faculty of Social Sciences. Application for re-admission must be made in writing to the Associate Dean (Studies) before the application deadline for the session in which the student seeks to be re-admitted. The letter of application should include an explanation of the student's academic performance and reasons why the student would expect to succeed if re-admitted. Further guidelines for the letter of appplication may be obtained from the Office of the Associate Dean (Studies).

In considering a student's request for re-admission, the Faculty's Admissions, Study and Reviewing Committee will use several criteria, including the student's academic record before and after admission to McMaster, the letter of application and the student's ability in English.

Students are advised that re-admission is a privilege given only to those who are able to show good reasons for an expectation of improved academic performance. In the case of students who have been Required to Withdraw, re-admission will not be considered for a session beginning within 12 months of this requirement except in extraordinary circumstances. If a student is applying for re-admission after the 12-month withdrawal period, a letter of reference from an employer may be required.

Re-admission is not automatic or guaranteed.

PROGRAMMES

Combined Honours Programmes: Subject to possible timetable restrictions, and provided that the student meets the requirements for entry into each of the relevant Honours Programmes, a student may combine work in any two departments, and be graduated with a Combined Honours degree in the two subjects.

All Combined Honours programmes must be approved by both Departments concerned as well as by the Associate Dean(s)(Studies).

These programmes will normally include approximately 36 units of work beyond Level I in each Department (normally 12 units of work per Level in each).

Honours Programmes: For requirements of Honours programmes see the University's statement on *Academic Regulations* in this Calendar.

Major Programme: For requirements of the Major programme see the university's statement on *Academic Regulations* in this calendar.

Bachelor of Arts Programmes: For requirements of Bachelor of Arts programmes see the University's Statement on *Academic Regulations* in this Calendar.

The only 3-Level *Combined* Bachelor's Degree programme is in Gerontology and Another Subject. The other subject may be from the Faculty of Social Sciences or the Faculty of Humanities. This programme may also be combined with the B.S.W. as a 4-Level programme.

PART-TIME STUDIES

Subject to limitations of course offerings, a student may pursue on a part-time basis any programme in the Faculty of Social Sciences, except for the B.P.E. programme. Normally, students will arrange their programme of studies in consultation with a Student Advisor in the Office of the Associate Dean (Studies) and with the Undergraduate Advisor of the appropriate Department.

Level I Programmes

SOCIAL SCIENCES I: 30 units

R 12 units from: Anthropology 1A03, 1Z03, 1B06; Canadian Studies 1A06; Economics 1A06; Geography 1A06, 1B06; Gerontology 1A06; Labour Studies 1A03, 1AA3; Political Science 1A06; Psychology 1A06; Religious Studies 1B06, 1D06, 1E06, 1F06, 1H03; Sociology 1A06.

Students registered in programmes in the Faculty of Social Sciences are required to complete 6 units of courses chosen from the Faculty of Humanities as stated above (*Academic Regulations, Humanities Requirement*). It is recommended that this requirement be completed in Level I.

Students may take more than 12 units of work in the Faculty of Social Sciences if they wish, subject to the conditions outlined in E (Electives) below.

E 18 units.

Normally, a student will take only 6 units of Level I work in any one discipline. In special circumstances, a student may be permitted to take up to 12 units in one discipline.

PHYSICAL EDUCATION I: 31 UNITS

R Physical Education 1A06, 1B03, 1E03, 1F03; Practicum: 1 unit, plus the McMaster Basic Swimming Test; Biology 1J03.

E 12 units.

Department of Anthropology

HONOURS ARTS AND SCIENCE AND ANTHROPOLOGY (B. Arts Sc.)

(See *Arts and Science Programme*)

Anthropology Subfields: (Applicable to all Anthropology programmes)

Anthropology includes the **four major subfields** of Social/Cultural Anthropology, Physical/Biological Anthropology, Archaeology, and Linguistics. Students may specialize in any one of these subfields though it is not necessary to do so. It should be noted, however, that each subfield has its own sequence of courses and prerequisites (see course listings by department in the Calendar).

Cultural/Social Anthropology:	Anthropology 2B03, 2C03, 2F03, 2G03, 2H03, 2I03, 2KK3, 2P03, 2Q03, 2R03, 2S03, 2X03, 2Z03, 3A03, 3B03, 3D03, 3F03, 3G03, 3H03, 3J03, 3JJ6, 3L03, 3P03, 3Q03, 3S06, 3T03, 3V03, 3X03, 3Z03, 4A03, 4I03, 4N03, 4Y03.
Physical/Biological Anthropology:	Anthropology 2D03, 2E03, 2J03, 2K03, 3Z03, 3ZZ3, 3N06, 3O06, 4O03, 4P03, 4Q03 (relevant courses are also offered by Biology and Physical Education).
Archaeology:	Anthropology 2A03, 2N03, 2O03, 2V03, 3K03, 3U03, 4E03, 4F03, 4M03 (relevant courses are also offered by History and Classics).
Linguistics:	Anthropology 2L03, 2M03, 2Q03, 2T03, 3I03, 3M03, 3Y03, 4K03.
Other courses:	Courses not distinguished by subfield include the reading courses 2W03, 2Y03, 3W03, 4G03 as well as the seminar course 4B03.

In planning your programme, it is important to take note of the prerequisites of certain of the higher level courses.

HONOURS ANTHROPOLOGY

Admission:

Completion of 30 units with an average of at least 7.0 in Anthropology 1A03 and 1Z03, or an average of at least 7.0 in Anthropology 1B06 and 1A03 or 1Z03.

Programme Notes:

1. See *subfield* descriptions above.
2. Honours students are required to take at least 3 units above Level I in *each* of the four Anthropology subfields. This requirement is in effect for students entering Level II in 1984-85 or later.
3. For students entering this programme **in September 1988** or later, the Graduation Average is computed on all Level II, III and IV Area courses. For students who entered the programme **before September 1988**, the Graduation Average is computed on all Level II, III and IV Anthropology courses taken.

Area Courses:

All Level II, III and IV Anthropology; Sociology 2Y03, Philosophy 2R03.

Levels II, III and IV: 90 units

R 36 units of Anthropology Area courses, including Anthropology 2F03, 3S06 and 4I03, Sociology 2Y03, Philosophy 2R03, and at least 9 additional units of Level IV Anthropology courses.

E Electives to make a total of 90 units.

B.A. IN ANTHROPOLOGY

Admission:

Completion of 30 units with an average of at least 4.0 in Anthropology 1A03 and 1Z03, or an average of at least 4.0 in Anthropology 1B06 and 1A03 or 1Z03.

Area Courses:

All Level II, III and IV Anthropology courses.

Levels II and III: 60 units

R 24 units of Anthropology beyond Level I, including Anthropology 2F03.

E Electives to make a total of 60 units.

Canadian Studies

The B. A. Programmes in Canadian Studies have been suspended. Courses with a focus on Canadian Studies are available. Students with an interest in this area should consult the section *Course Listings, Canadian Studies* in this Calendar. A Canadian Studies Theme of Study also exists within the Humanities Interdisciplinary B.A., as described in the section *Programmes for the B.A., B.A. (Honours) and B.Mus. Degree, Humanities Interdisciplinary B.A.*

Department of Economics

HONOURS COMMERCE AND ECONOMICS

In conjunction with the Faculty of Business, a programme is offered in Honours Commerce and Economics. Since students register in the Faculty of Business, details concerning admission, the programme of study and academic requirements are given in the *Faculty of Business* section of the Calendar.

HONOURS ARTS AND SCIENCE AND ECONOMICS

(B. Arts Sc.)

(See *Arts and Science Programme*)

A Combined Honours programme is offered for students in the Arts and Science Programme. The academic requirements and programme of study are given in the *Arts and Science Programme* section of the Calendar.

HONOURS ECONOMICS

Admission:

Completion of **any Level I** programme with an average of at least 7.0 in Economics 1A06 and 6 units of Mathematics (or another 6 units acceptable to the Department), including a grade of at least B− in Economics 1A06.

Programme Notes:

1. **English Requirement:** Students entering this programme in September 1985 or later are required to complete English 1D06 or equivalent, by the end of Level II. It is strongly recommended that the English course be included in the student's Level I programme.
2. **Mathematics Requirement:** One course from each of the following groups must be completed by the end of Level II.
   a. Grade 13 or OAC Calculus or Mathematics 1K03.
   b. Mathematics 1A06 or 1M03.
   c. Mathematics 1L03.

   (Students with credit in Mathematics 1F06 or 1G06 have fulfilled the Mathematics requirements. Students with credit in Mathematics 1B03, 1B04 or 1G04 must consult a Departmental adviser.)
3. The Graduation Average is computed on all Level II, III and IV Economics courses.

Area Courses:

All Level II, III and IV Economics courses.

Levels II, III and IV: 90 units

R 48 to 66 units of Economics, including Economics 2L06, 2M06, 3O06, 3A03, 3AA3, one of 2K03, 3I03, 3R03; at least 24 units outside of Economics; additional English and Mathematics units as described above in *Programme Notes*, if not completed in Level I.

E Electives to make a total of 90 units. Mathematics 2L03 is recommended as preparation for Economics 3A03, 3AA3.

COMBINED HONOURS IN ECONOMICS AND ANOTHER SUBJECT

Admission:

Completion of **any Level I** programme, including a grade of at least B− in each of Economics 1A06 and 6 units of the other subject.

Programme Notes:

1. **English Requirement:** See *Honours Economics* above.
2. **Mathematics Requirement:** See *Honours Economics* above.
3. With the approval of both departments concerned, students may arrange to follow a Combined Honours programme in Economics and another subject in the Faculties of Social Sciences or Humanities. The Economics component of such programmes is described below. Unless otherwise specified below, Cumulative Area Averages are computed separately for each subject. Students wishing to arrange such programmes are urged to discuss their interests with the departments concerned. Requirements for a number of specific joint Honours programmes that have been arranged in the past are also described below.
4. The Economics component of the Graduation Average is computed on all Level II, III and IV Economics courses.

Area Courses:

All Level II, III and IV Economics courses.

Levels II, III and IV: 90 units

R At least 36 units of Economics, and additional courses as required by the other department, including Economics 2L06, 2M06, 3O06 (students combining Economics with Religious Studies or a subject in Humanities may subsititute Economics 2B03 for 3O06), 3A03, 3AA3, one of Economics 2K03, 3I03, or 3R03; additional English and Mathematics units as described above in *Programme Notes*, if not completed in Level I; three or six units of Statistics offered by the other department may be substituted for Economics 2B03 or 3O06 respectively.

E Electives, if needed, to make a total of 90 units. Mathematics 2L03 or equivalent is recommended as preparation for Economics 3A03, 3AA3.

HONOURS ECONOMICS AND COMPUTER SCIENCE

Admission:

Completion of **any Level I** programme, including Computer Science 1MA3 and 1MB3, and including a grade of at least B− in Economics 1A06, and an average of at least 7.0 in Economics 1A06, Computer Science 1MB3, Mathematics 1A06 and Mathematics 1B03. Mathematics 1B03 may be postponed until Level II.

Programme Notes:

1. Because of resource limitations, enrolment in *Honours Economics and Computer Science* is limited. Students intending to enter the programme must consult the Department of Computer Science and Systems.
2. **English Requirement:** See *Honours Economics* above.
3. The Graduation Average is computed on all Level II, III and IV Economics and Computer Science courses.

Area Courses:

All Level II, III and IV Economics and Computer Science courses.

Levels II, III and IV: 90 units

R At least 36 units of Economics, including Economics 2L06, 2M06, 3A03, 3AA3; one of Economics 2K03, 3I03, 3R03; Statistics 2D03; either Statistics 2M03 and 3D06, or Economics 3O06; Computer Science 2MF3 (if Computer Science 1C03 not completed), 2MC3, 2MD3, 3MG3, 4MP6; two of Computer Science 3CA3, 3EA3, 3MI3, 3MH3; 6 additional units of Computer Science; and additional English units as described above in *Programme Notes* if not completed in Level I. Computer Science 3EA3 is strongly recommended. Computer Science 2ME3, 4EB3,4EC3 are recommended as preparation for Business Data Processing.

E Electives to make a total of 90 units.

HONOURS ECONOMICS AND GEOGRAPHY

Admission:

Completion of **any Level I** programme with a grade of at least B− in each of Economics 1A06 and Geography 1B06.

Programme Notes:

1. No student may register in any Level of this programme without the approval of a Geography Departmental Counsellor, which should be obtained before completing registration forms.
2. **English Requirement:** See *Honours Economics* above.
3. **Mathematics Requirement:** See *Honours Economics* above.
4. A single Cumulative Area Average and a single Graduation Average will be computed.

Area Courses:

Geography 2A03, 2B03, 2LL3, 2L03, 2R03, 2Y03, 3G03, 3N03, 3O03, 3Q03, 3T03, 3X03, 4C06, 4F03, 4H03, 4J03, 4N03, 4T03, 4X03, 4Y03; all Level II, III and IV Economics courses.

Level II: 30 units

R Geography 2LL3, 2L03 or Economics 3O06 (in Level III); 9 units from Geography 2A03, 2B03, 2R03, 2Y03; Economics 2L06, 2M06; one of Economics 2K03, 3I03, 3R03 (this requirement may be met in Level III or IV); Mathematics and English requirements as listed above if not completed in Level I.

E Electives to make a total of 30 units.

Level III: 30 units

R Geography 3O03, 3Q03 and 6 units of Geography from 3G03, 3T03, 3X03; Economics 3A03, 3AA3, 3O06 (if Geography 2LL3 and 2L03 not taken in Level II), and 6 additional units of Economics.

E Electives to make a total of 30 units.

Level IV: 30 units

R Geography 4C06 and at least 6 other units of Level IV Area courses in Geography; 12 units of Economics.

E 6 units elective.

HONOURS ECONOMICS AND MATHEMATICS

Admission:

Completion of **any Level I** programme, including a grade of at least B– in Economics 1A06 and an average of at least 7.0 in Mathematics 1A06 and 1B03.

Programme Notes:

1. **English Requirement:** See *Honours Economics* above.
2. Graduation Average is computed on all Level II, III and IV Economics, Mathematics and Statistics courses.

Area Courses:

All Level II, III and IV Economics, Mathematics and Statistics courses.

Levels II, III and IV: 90 units

R At least 36 units of Economics and 36 units of Mathematical Sciences, selected as follows: Economics 2L06, 2M06, 3A03, 3AA3; one of 2K03, 3I03, 3R03; Statistics 2D03; either Economics 3O06 or Statistics 3D06; Mathematics 2A06, 2B06, 2F03; one of 2C03, 3A06, 3O06; 15 units from Mathematics 3E06, 3F06, 3P03, 3Q03, 3R03, 3S03, 3T03, 4A06, 4C03, 4G03, 4J03, 4K03, 4O03, Statistics 3D06, 3S03, 3U03, 4H03, 4K03, 4M03.

E Electives to make a total of 90 units.

HONOURS ECONOMICS AND POLITICAL SCIENCE

Admission:

Completion of **any Level I** programme including a grade of at least B– in each of Economics 1A06 and Political Science 1A06.

Programme Notes:

1. **English Requirement:** See *Honours Economics* above.
2. **Mathematics Requirement:** See *Honours Economics* above.

Area Courses:

All Level II, III and IV Economics and Political Science courses.

Level II: 30 units

R Economics 2L06 and 2M06; one of Economics 2K03, 3I03, 3R03 (may be postponed to Levels III or IV); 12 units of Level II Political Science (Political Science 2F06 is recommended); Mathematics and English requirements as described above in *Programme Notes*, if not completed in Level I.

E Electives to make a total of 30 units, at least 3 of which must be outside of Economics and Political Science.

Level III: 30 units

R Economics 3A03, 3AA3 and 3O06; 12 units of Level III or IV Political Science.

E 6 units elective.

Level IV: 30 units

R 12 units of Economics, including 3 units from Economics 2K03, 3I03, 3R03 (if not previously completed); 6 units of Level IV Political Science and 6 units of either Level III or IV Political Science.

E 6 units elective.

B.A. IN ECONOMICS

Admission:

Completion of **any Level I** programme with a grade of at least C– in Economics 1A06. It is recommended that students take Mathematics 1K03, 1L03 and 1M03 in Level I.

Programme Notes:

1. **English Requirement:** Students entering this programme in September 1985 or later are required to complete English 1D06 or equivalent by the end of Level II. It is strongly recommended that the English course be included in the student's Level I programme.
2. **Mathematics Requirement:** One course from each of the following groups must be completed by the end of Level II.
   a. Grade 13 or OAC Calculus or Mathematics 1K03.
   b. Mathematics 1A06 or 1M03.(Students entering Level II in 1984-85 or before are exempt from this requirement.)
   c. Mathematics 1L03.

   (Students with credit in Mathematics 1F06 or 1G06 have fulfilled the Mathematics requirements. Students with credit in Mathematics 1B03, 1B04 or 1G04 must consult a Departmental adviser.)

Area Courses:

All Level II, III and IV Economics courses.

Levels II and III: 60 units

R 24 to 36 units of Economics, including one of Economics 2K03, 3I03, 3R03; Economics 2G03 or 2L06; Economics 2H03 or 2M06; Economics 2B03 or 3O06; additional English and Mathematics requirements as described above in *Programme Notes*, if not completed in Level I; at least 24 units outside Economics, including Mathematics and English if taken in Levels II and III.

E Electives to make a total of 60 units.

Department of Geography

HONOURS GEOGRAPHY (B.Sc.) AND B.Sc. IN GEOGRAPHY AND HONOURS GEOGRAPHY AND GEOLOGY (B.Sc.)

(See B.Sc. Programmes in Geography, *Faculty of Science, Department of Geography*)

HONOURS ECONOMICS AND GEOGRAPHY (B.A.)

(See *Department of Economics*)

HONOURS HISTORY AND GEOGRAPHY (B.A.)

(See *Faculty of Humanities, Department of History*)

HONOURS ARTS AND SCIENCE AND GEOGRAPHY (B. Arts Sc.)

(See *Arts and Science Programme*)

HONOURS GEOGRAPHY (B.A.)

Admission:

Completion of **any Level I** programme with at least a B– in Level I Geography, and an average of at least 7.0 in that and 6 additional units. One of Mathematics 1A06, 1C06 or 1M03 must be completed by the end of Level II. Its inclusion in the student's Level I programme is strongly recommended. Students are reminded of the Humanities requirement of the Faculty of Social Sciences. (See *Faculty of Social Sciences, Humanities Requirement.*)

Programme Notes:

1. No student may register in any Level of this programme without the approval of a Departmental Counsellor, which should be obtained before completing registration forms in March.
2. Students are advised to take Geography 1A06 or 1B06 in Level I and to take Geography 2L03 and 2LL3 in Level II. Geography 3O03 must be taken in Level III. Students should consult the *Handbook for Undergraduate Geographers*, which may be obtained from the departmental office.

Area Courses:

All Level II, III and IV Geography courses.

Level II: 30 units

R Geography 2LL3 and 2L03, at least 12 units of 2A03, 2B03, 2D03, 2F03, 2K03, 2R03, 2T03, 2W03, 2Y03, and one of Mathematics 1A06, 1C06 or 1M03 if not taken in Level I.

E Electives to make a total of 30 units. At least 6 units of electives must be in Humanities or Science, excluding Geography.

Level III: 30 units

R Geography 3O03; at least 12 units from Geography 3D03, 3F03, 3G03, 3K03, 3M03, 3NN3, 3P03, 3Q03, 3T03, 3W03, 3X03, 3Z03, and 3 additional units of Level III or IV Geography.

E Electives to make a total of 30 units, 6 of which must not be from Geography.

Level IV: 30 units

R Geography 4C06; at least 12 additional units of Level IV Geography.

E Electives to make a total of 30 units, 6 of which must not be from Geography.

HONOURS GEOGRAPHY AND ENVIRONMENTAL STUDIES (B.A.)

The offering of this programme is contingent upon approval by the Ontario Council on University Affairs and resource approval from the Board/Senate Committee on Academic Planning (BSCAP). Further information should be obtained from the Associate Dean (Studies) of Social Sciences.

Admission:

Completion of **Social Sciences I** including Mathematics 1M03 or 1K03, Economics 1A06, Geography 1A06 with a grade of at least B− and Biology 1G06.

Area Courses:

Anthropology 2F03, 2H03, 2K03, 3F03, 3V03, 3Z03, 4A03, 4B03, 4E03; Biology 2D03, 2E03, 3A06, 3SS3, 3TT3, 4D03, 4Y03; Economics 2G03, 2L06, 3J03, 3V03, 3W03, 3Z03, 4E03, 4G03, 4GG3, 4H03; Geography 2F03, 2K03, 2R03, 2T03, 3W03, 3F03, 3G03. 3K03, 3L03, 3M03, 3NN3, 3P03, 3V03, 3W03, 4A03, 4D03, 4J03, 4K03, 4N03, 4P03, 4Q03, 4R03, 4S03, 4T03, 4W03; Philosophy 2M03; Political Science 2E06, 2G06, 3CC3, 3S03,3Z03, 4F06, 4K06, 4O06; Sociology 2H06, 3G03, 3HH3, 4O03.

Level II: 30 units

R Geography 2LL3, 2L03, 2U03; Biology 2F03; 12 units of area courses of which at least 3 must be from Geography and at least 6 outside of Geography.

E 6 units. Geology 1A03 or 1C03 is strongly recommended.

Level III: 30 units

R Geography 3E03, 3J03, 3O03, 3U03, 3C03; 12 units of area courses, at least 6 of which may not be from Geography.

E 3 units.

Level IV: 30 units

R Geography 4C06, 4V06; 12 units of area courses, at least 6 of which may not be from Geography.

E 6 units.

HONOURS GEOGRAPHY AND GEOLOGY (B.A.)

Admission:

Completion of **any Level I** programme with a grade of at least B− in both Geography 1A06 and Geology 1A03 or 1C03. Six units of Mathematics (either 1A06 or 1C06, or two of 1K03, 1L03, 1M03) which must be completed by the end of Level II. Their inclusion in the student's Level I programme is strongly recommended. Chemistry 1C03 must be completed by the end of Level III.

Programme Notes:

1. No student may register in any Level of this programme without the approval of a Departmental Counsellor, which should be obtained before completing registration forms in March.
2. Students wishing to enter this programme are to follow the procedures for admission to the Limited Enrolment Programme In Geology.
3. This programme is considered to have a unified area. The Graduation Average is calculated on at least 36 units of Levels III and IV courses. Geology 2D06 will be included in calculating the Graduation Average.
4. Geology 3E02 is normally taken at the end of Level II. This course is scheduled outside of the regular term.

Area Courses:

Geography 2F03, 2K03, 2LL3, 2L03, 2L06, 2T03, 2W03, 3E03, 3F03, 3I03, 3K03, 3M03, 3NN3, 3O03, 3P03, 3V03, 3W03, 4A03, 4C06, 4D03, 4E03, 4K03, 4N03, 4P03, 4Q03, 4R03, 4W03; All Geology courses above Level I except Geology 2E01 and 3E02.

Level II: 31-34 units

R Geography 2LL3, 2L03, 2T03 and one of Geography 2F03, 2K03, 2P03, 2W03; Geology 2B06, 2C03, 2DD3, 2E01; 6 units of Mathematics (either 1A06, 1C06, or 1K03 and one of 1L03 or 1M03) if not taken in Level I, or 3 to 6 units from the Faculties of Science or Engineering approved by the Departments. (Chemistry 1C03 is strongly recommended and must be completed by the end of Level III.)

E Electives, excluding Geography and Geology, to make a total of 31 to 34 units.

Level III: 29-32 units (1989-90)

R Geography 3E03, 3M03, 3O03, and one of 3F03, 3K03, 3NN3, 3P03, or 3W03; Geology 2DD3, 3C06, 3DD3, 3E02; Chemistry 1C03 if not previously completed.

E Electives to make a total of 29 to 32 units, at least 3 of which may not be Geography or Geology.

Level III: 32 units (1990-91)

R Geography 3E03, 3M03, 3O03, and one of 3F03, 3K03, 3NN3, 3P03, 3W03; Geology 3CC6, 3E02, and one of 2J03, 2I03, 3DD3, or 3F03.

E Electives to make a total of 32 units, at least 3 of which may not be Geography or Geology.

Level IV: 30-31 units (1989-90 and 1990-91)

R 18 units of Area Courses including 6 units of Level IV Geography Area courses, 6 units of Level IV Geology Area courses, and 6 units of Level IV Geography or Level III or IV Geology Area courses.

E Electives to make a total of 30 to 31 units. Geology 3G04 or 3G03 is strongly recommended.

Level IV: 30 units (1991-92)

R 18 units of Area courses including 6 units of Level IV Geography Area courses and 6 units of Level IV Geology Area courses and 6 units of Level IV Geography Area courses or Level III or IV Geology courses. Geology 3S03 must be taken if not already completed.

E Electives to make a total of 30 units. Geology 3G03 is strongly recommended.

B.A. IN GEOGRAPHY

Admission:

Completion of **any Level I** programme, including Level I Geography with a grade of at least C−, and one other subject with a grade of at least C−.

Programme Note:

No student may register in any Level of this programme without the approval of a Departmental Counsellor, which should be obtained before completing registration forms.

Area Courses:

All Level II, III and IV Geography courses.

Level II: 30 units

R At least 6 units from Geography 2A03, 2B03, 2D03, 2F03, 2K03, 2LL3, 2R03, 2T03, 2U03, 2W03, 2Y03; at least 6 additional units of Level II Geography.

E Electives to make a total of 30 units, so that at least 18 units outside Geography are taken in Levels II and III.

Level III: 30 units

R At least 6 units from Geography 3D03, 3F03, 3G03, 3K03, 3M03, 3P03, 3NN3, 3Q03, 3T03, 3W03, 3X03, 3Z03; at least 6 additional units of Level III Geography.

E Electives to make a total of 30 units, so that at least 18 units outside Geography are taken in Levels II and III.

Gerontological Studies

HONOURS ARTS AND SCIENCE AND GERONTOLOGY
(B. Arts Sc.)
(See *Arts and Science Programme*)

COMBINED HONOURS IN GERONTOLOGY AND ANOTHER SUBJECT
Admission:
Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B− in Gerontology 1A06 or Social Science 2G06, and satisfaction of admission requirements for the Honours B.A. programme in the other subject.

Programme Notes:

1. **Enrolment in programmes in Gerontology is limited.** Application for admission, including a statement explaining the applicant's interest in the Programme, should be made to the Chairman of the Committee of Instruction, **prior to April 15**. The Admissions Committee *may* wish to interview the applicants.
2. Students who have not taken Gerontology 1A06 or Social Science 2G06 in Level I *may* be considered for admission to the programme, and should consult the Chairman of the Committee of Instruction.
3. Courses other than those listed below as *Area Courses*, may qualify as Gerontology Area courses. Students wishing to designate an Area course not on the list of Gerontology Area courses must do so at registration, with the permission of the Chairman of the Committee of Instruction.
4. Students should refer to the section *Course Listings* in this Calendar, and take note of the prerequisites for the Area courses.
5. Students who have completed a three level combined Gerontology and Another Subject programme may, if qualified, register in the Combined Honours in Gerontology and Another Subject as a Second Degree Programme. The other subject must be the same as in the first degree. Students must apply to the University as second degree candidates and consult the Chairman of the Committee of Instruction.

Area Courses:
All Level II, III and IV Gerontology courses, and all designated Gerontology Area courses: Anthropology 3Q03; Health Sciences 3B04, 4C03, 4D03; History 3EE3; Philosophy 3C03; Religious Studies 2A06, 2WW3; Social Work 3C03; Sociology 3G03, 3HH3, 3X03; or other designated and approved Area courses. (See *Programme Notes* above.)

Levels II, III and IV: 90 units
R Gerontology 2A03, 3B03, 3C03; one of Gerontology 2B03 or 3D03; Gerontology 4A06 (Thesis) or Psychology 4D06; 3 units of Level IV Gerontology Area courses; 15 additional units of Gerontology Area courses; the Area requirements of the Honours B.A. programme of the other subject.
E Electives, beyond Level I, to a total of 90 units.

B.A. IN GERONTOLOGY AND ANOTHER SUBJECT
Admission:
Completion of **any Level I** programme with a Grade of at least C− in Gerontology 1A06 or Social Science 2G06, and satisfaction of admission requirements for the B.A. in the other subject.

Programme Notes:

1. **Enrolment in programmes in Gerontology is limited.** Application for admission, including a statement explaining the applicant's interest in the Programme, should be made to the Chairman of the Committee of Instruction, **prior to April 15**. The Admissions Committee may wish to interview the applicants.
2. Students who have not taken Gerontology 1A06 or Social Science 2G06 *may* be considered for admission to the programme and should consult the Chairman of the Committee of Instruction.
3. Courses other than those listed below as *Area Courses*, may qualify as Gerontology Area courses. Students wishing to designate an Area course not on the list of Gerontology Area courses must do so at registration, with the permission of the Chairman of the Committee of Instruction.
4. No more than 6 units of work in the other subject of the combined programme which are also Gerontology Area courses may be used to fulfill the requirements of both programme components.
5. Students should refer to the section *Course Listings* in this Calendar, and take note of the prerequisites for some of the Area courses.

Area Courses:
All Level II and Level III Gerontology courses and the following designated Gerontology Area Courses: Anthropology 3Q03; Health Sciences 3B04, 4C03, 4D03; History 3EE3; Philosophy 3C03; Religious Studies 2A06, 2WW3; Social Work 3C03; Sociology 3G03, 3HH3, 3X03; or other designated and approved Area courses. (See *Programme Notes* above.)

Levels II and III: 60 units
R Gerontology 2A03; 3B03; 3C03; one of 2B03 or 3D03; 12 units of Gerontology Area Courses; the Area requirements of the B.A. programme of the other subject.
E Electives, beyond Level I, to a total of 60 units.

B.A. IN GERONTOLOGY AS A SECOND DEGREE
Admission:
Completion of an undergraduate degree from a recognized university normally with a Graduation Average of at least 4.0 (or its equivalent), a grade of at least C− in Gerontology 1A06 (or its equivalent), and evidence of personal interest in gerontological studies which may be evaluated by one or a combination of a written statement and an interview.

An applicant is normally required to complete the prerequisite undergraduate degree work by April of the year in which application is made.

Students who have completed a three level combined Gerontology and Another Subject programme may, if qualified, register in the Combined Honours in Gerontology and Another Subject as a Second Degree Programme. The other subject must be the same as in the first degree. Students must apply to the University as second degree candidates and consult the Chairman of the Committee of Instruction.

Programme Notes:

1. **Enrolment in programmes in Gerontology is limited.** Application for admission, including a statement explaining the applicant's interest in the programme, should be made to the Chairman of the Committee of Instruction **prior to April 15**. Applicants must **also** apply for admission to the University through the office of the Associate Registrar (Liaison and Admissions).
2. Students who have not included Gerontology 1A06 (or its equivalent) in their first degree programme *may* be considered for admission to the programme and should consult the Chairman of the Committee of Instruction.

Requirements: 30 units
R 24 units of Gerontology or Gerontology Area Courses beyond Level I, including Gerontology 2A03, 3B03, 3C03, and one of 2B03 or 3D03.
E 6 units

Labour Studies

HONOURS LABOUR STUDIES
Admission:
Completion of **any Level I** programme with an average of at least 7.0 in Labour Studies 1AA3 and 1A03, and an overall average of at least 7.0 in 12 units, which includes Labour Studies 1AA3 and 1A03, and 6 units from Economics 1A06, History 1C06, Mathematics 1K03, Mathematics 1L03, Political Science 1A06, Psychology 1A06, Sociology 1A06.

Programme Notes:

1. **Enrolment in the Labour Studies Programme is limited.** Application for admission, including a statement explaining the applicant's interest in the programme, should be made to the Chairman, Committee of Instruction, **prior to April 15**. The Admissions Committee *may* wish to interview each applicant.

2. Students must successfully complete Economics 1A06 and Sociology 1A06 by the end of Level II.

Area Courses:
All Level II, III and IV Labour Studies courses; Commerce 2BA3, 4BC3, 4BD3.

Level II: 30 units
R Labour Studies 2A06, 2B03, 2C03; Commerce 2BA3.
E 15 units.

Level III: 30 units
R Labour Studies 3A06, 3B03 or 3I03, 3C03; Commerce 4BC3 and 4BD3.
E 12 units which may include Commerce 3BB3.

Level IV: 30 units
R Labour Studies 3D03 or 3E03, 4A06, 4B03, 4C03, 4D03.
E 12 units.

COMBINED HONOURS IN LABOUR STUDIES AND ANOTHER SUBJECT.

Admission:
Completion of **any Level I** programme with an average of at least 7.0 in Labour Studies 1AA3 and 1A03, *and* an overall average of at least 7.0 in 12 units, which includes Labour Studies 1AA3 and 1A03, and 6 units from Economics 1A06, History 1C06, Mathematics 1K03, Mathematics 1L03, Political Science 1A06, Psychology 1A06, Sociology 1A06, *and* satisfaction of the admission requirements for the Honours B.A. programme in the other subject.

Programme Notes:

1. **Enrolment in the Labour Studies Programme is limited.**
   Application for admission, including a statement explaining the applicant's interest in the programme, should be made to the Chairman, Committee of Instruction, **prior to April 15**. The Admissions Committee *may* wish to interview each applicant.
2. Students must successfully complete Economics 1A06 and Sociology 1A06 by the end of Level II.

Area Courses:
Level II, III and IV Labour Studies courses; Commerce 2BA3, 4BC3, 4BD3.

Level II, III and IV: 90 units
R Labour Studies 2A06, 2C03, 3A06, 3C03, 4A06, 4B03, 4C03; Commerce 4BC3 and 4BD3.
E Electives to make a total of 90 units.
This may include Commerce 3BB3.

B.A. IN LABOUR STUDIES

Admission:
Completion of **any Level I** programme with an average of at least 4.0 in Labour Studies 1AA3 and 1A03 and an overall average of at least 4.0 in 12 units, which includes Labour Studies 1AA3 and 1A03, and 6 units from Economics 1A06, History 1C06, Mathematics 1K03, 1L03, Political Science 1A06, Psychology 1A06 and Sociology 1A06.

Programme Notes:

1. **Enrolment in the Labour Studies Programme is limited.**
   Application for admission, including a statement explaining the applicant's interest in the programme, should be made to the Chairman, Committee of Instruction, **prior to April 15.** The Admissions Committee *may* wish to interview each applicant.
   Students applying for the Honours Programme will automatically be considered for the B.A. Programme
2. Students must successfully complete Economics 1A06 and Sociology 1A06 by the end of Level II.
3. Part-time students continuing under the regulations of the previous B.A. Programme (i.e., who **entered** the programme **prior to 1987/88**) should consult the office of the Associate Dean (Studies) of the Faculty of Social Sciences or the Director of Labour Studies.

Area Courses:
All Level II and III Labour Studies courses; Commerce 2BA3, 4BC3, 4BD3.

Level II: 30 Units
R Labour Studies 2A06, 2B03, 2C03; Commerce 2BA3.
E 15 units.

Level III: 30 units
R Labour Studies 3A06; Commerce 4BC3 and 4BD3; 6 units from Labour Studies 3B03, 3C03, 3D03, 3E03, 3I03.
E 12 units which may include Commerce 3BB3.

School of Physical Education and Athletics

PROGRAMME FOR THE B.P.E. DEGREE

The School of Physical Education and Athletics offers a four-year programme leading to the degree of Bachelor of Physical Education (B.P.E.). The programme differs somewhat from the majority of Physical Education programmes in the province in that students begin to take courses leading to the degree in Level I. As a result, the programme is divided into **two** distinct parts.

During **Levels I and II** students take *a core of thirty-six units of required theoretical* courses in which they are introduced to the various theoretical sub-disciplines of Physical Education, *and a core of five units of required practicum* courses.

During **Levels III and IV** students are free to select from a variety of Physical Education electives in both the theoretical and practicum areas. These courses, supplemented by the arts and science electives selected by the student, may be grouped in various ways with career and/or graduate study goals in mind.

ACADEMIC REGULATIONS

Students enrolled in Physical Education, in addition to meeting the General Academic Regulations of the University, shall be subject to a number of School regulations.

Continuation in Programme
Students in **Physical Education I** must:

1. obtain a university average (UA) of at least 4.0 (weighted average of grades in all courses taken).
2. obtain a Cumulative Area Average (CAA) of at least 4.0 calculated as a weighted average of grades in all Physical Education courses taken.
3. obtain a grade of at least D– in each Area course.

Beyond Level I a student must achieve a minimum grade of D– in each Area course taken and a CAA of a least 4.0 at each review in order to continue in the programme.

Failure to meet the above requirements leads to one of two conditions:

1. May Not Continue in the Programme: Re-Admission
   A student who is ineligible to continue in the B.P.E. programme may apply for re-admission after not less than one year. Application for re-admission must be made in writing to the Undergraduate Chairman in **March** of the year re-admission is desired. Students normally will not be considered for readmission unless they have achieved a B– (7.0) average in at least 24 units of university course work.
   Re-admission Is Not Guaranteed.
2. May Continue on Probation: Repeated Courses
   Students who have failed (F grade) any Area course, but who have achieved a CAA of 4.0 at the review period may be permitted to continue on probation *subject to the approval* of the School of Physical Education Admissions and Review Committee. In such cases the student must repeat any failed *Required Area* course or replace any failed *Elective Area* course. To lift the probationary status a minimum grade of C– must be obtained in any repeated course.

Work Load
All B.P.E. students must complete a Winter Session work load of 31 units in Level I, and 34 units in each of Levels II, III, and IV. Advanced credit and credit earned during Summer Sessions may be used to reduce this load requirement. Such reductions will be applied as late as possible in

a student's programme. In any Winter Session, a student may not register for any more than the required number of units without the approval of the Undergraduate Chairperson. While no unit credit is given, students are also *required* to pass the McMaster Basic Swimming Test, normally during Level I, but no later than the end of Level II.

Graduation
The minimum requirement for graduation from the B.P.E. programme is a CAA of 4.0 in at least 60 units of Area courses taken in Levels II, III, and IV. A student may be awarded First, Second, or Third Class standing on the basis of the Graduation Average (GA).

Students require 133 units to graduate. These units are composed of 54 units of electives, 66 units of Physical Education theory, and 13 units of Physical Education practicum.

Area Courses
All Level I, II, III and IV Physical Education courses and Biology 1J03. Normally, the requirements for each Level must be completed satisfactorily before a student is allowed to proceed to the next Level of the Physical Education programme.

Level I: 31 units
R Physical Education 1A06, 1B03, 1E03, 1F03; Practicum: 1 unit, plus the McMaster Basic Swimming Test; Biology 1J03.
E 12 units, excluding Physical Education courses.

Level II: 34 units
R Physical Education 2A03, 2B03, 2C06, 2D03, 2F03; Practicum: 4 units, plus the McMaster Basic Swimming Test, if not passed in Level I.
E 12 units, excluding Physical Education courses.

Level III: 34 units
R 15 units from Level III or IV Physical Education courses; Practicum: 4 units.
E 15 units, excluding Physical Education courses.

Level IV: 34 units
R 15 units from Level III or IV Physical Education courses. Practicum: 4 units.
E 15 units, excluding Physical Education courses.

B.P.E. AS A SECOND DEGREE

Individuals already holding an undergraduate degree may be admitted to the Physical Education programme. Applications should be made to the Undergraduate Physical Education programme **prior to May 15** for the Fall term.

Enrolment is limited and applicants must normally provide evidence of at least second class standing (B–) in their previous university work to be eligible. Only full-time students will be considered.

Students are required to take 79 units of Physical Education courses which consist of 66 units of Physical Education theory and 13 units of Physical Education practicum, plus satisfactory completion of the McMaster Basic Swimming Test. Level I and II theory and practicum courses must be taken in sequence and be completed before Level III and IV courses are undertaken.

The B.P.E. degree will be awarded if the student achieves a minimum grade of D– in each course and maintains a CAA of at least 4.0 (C–).

TRANSFERRING INTO THE SCHOOL OF PHYSICAL EDUCATION

Undergraduate students from McMaster University or any other university seeking to transfer into the B.P.E. program *may* be admitted. Enrolment is limited and applicants must normally provide evidence of at least second class standing (B–) in their previous university work to be eligible. Only full-time students will be considered.

Department of Political Science

HONOURS ARTS AND SCIENCE AND POLITICAL SCIENCE (B. Arts Sc.)

(See *Arts and Science Programme*)

HONOURS ECONOMICS AND POLITICAL SCIENCE

(See *Department of Economics*)

HONOURS GERMAN AND POLITICAL SCIENCE

(See *Faculty of Humanities, Department of Modern Languages-German*)

HONOURS RUSSIAN AND POLITICAL SCIENCE

(See *Faculty of Humanities, Department of Modern Languages-Russian*)

HONOURS POLITICAL SCIENCE

Admission:
Completion of **any Level I** programme with an average of at least 7.0 in Political Science 1A06 and 6 other units, including a grade of at least B– in Political Science 1A06.

Programme Notes:
1. After completion of Level I, students in Honours Political Science must complete at least 48 units of Political Science and at least 30 units of electives outside of Political Science.
2. Recommended Courses: Political Science 2F06 and Political Science 2O06 are recommended to students enrolled in Honours Political Science because their conceptual concerns underlie all political analysis. Political Science 2F06, 2O06 will be included in calculating the Graduation Average if taken in Level III.
3. Prerequisites: All students should note those Level II Political Science courses that are required in order to register in a number of Level III and Level IV courses.

Area Courses:
All Level II, III and IV Political Science courses.

Level II: 30 units
R 12 units of Level II Political Science.
E 18 units elective, only 6 of which may be from Political Science.

Level III: 30 units
R 18 units of Level III Political Science; or 12 units Level III Political Science and 6 units of Political Science 2F06 or 2O06.
E 12 units elective, only 6 of which may be from Political Science.

Level IV: 30 units
R Political Science 4Z06; 6 units of Level IV Political Science; 6 units of either Level III or IV Political Science.
E 12 units elective.

COMBINED HONOURS IN POLITICAL SCIENCE AND ANOTHER SUBJECT

Admission:
Completion of **any Level I** programme with a weighted average of at least 7.0 in 12 units of Level I work, including a grade of at least B– in Political Science 1A06, and satisfaction of the admission requirements for the Honours programme in the other subject.

Programme Notes:
1. During Levels II, III and IV, students in the Combined Honours programme must complete not fewer than 36 units of Political Science, of which only 12 units may be in Level II courses, and at least 6 units should be in Level IV courses.
2. Recommended Courses: Political Science 2F06 and Political Science 2O06 are recommended to students enrolled in Honours Political Science because their conceptual concerns underlie all political analysis. Political Science 2F06, 2O06 will be included in calculating the Graduation Average if taken in Level III.

Area Courses:
All Level II, III and IV Political Science courses for the Political Science component.

B.A. IN POLITICAL SCIENCE

Admission:
Completion of **any Level I** programme, with a grade of at least C– in Political Science 1A06.

Programme Notes:
1. After completion of Level I, students in the B.A. programme must complete at least 24 units of Political Science, of which 12 units should be in Level III or Level IV, and at least 24 units of electives outside of Political Science.

2. Prerequisites: All students should be alerted to those Level II Political Science courses that are required in order to register in a number of Level III and IV courses. Students at Level III may take courses at Levels II, III or IV, provided they meet the prerequisites.

Area Courses:
All Level II, III and IV Political Science courses.

Level II: 30 units
R 12 to 18 units of Level II Political Science.
E Electives to make a total of 30 units, with at least 12 units outside Political Science.

Level III: 30 units
R 12 to 18 units of Level III or IV Political Science.
E Electives to make a total of 30 units.

Department of Psychology

HONOURS PSYCHOLOGY (B.Sc.), MAJOR PSYCHOLOGY (B.Sc.) AND B.Sc. IN PSYCHOLOGY

(See B.Sc. Programmes in Psychology, *Faculty of Science, Department of Psychology*)

HONOURS BIOLOGY AND PSYCHOLOGY (B.Sc.)

(See *Faculty of Science, Department of Biology*)

HONOURS COMPUTER SCIENCE AND PSYCHOLOGY (B.Sc.)

(See *Faculty of Science, Department of Computer Science & Systems*)

HONOURS ARTS AND SCIENCE AND PSYCHOLOGY (B. Arts Sc.)

(See *Arts and Science Programme*)

HONOURS PSYCHOLOGY (B.A.)

Admission:
Completion of **any Level I** programme with a grade of at least B− in Psychology 1A06, at least B− in six additional units, at least C− in English 1D06 or equivalent, and credit in Mathematics 1A06 or 1F06 or at least C− in Mathematics 1M03.

Students who did not complete the English or Mathematics requirements in Level I should obtain the permission of the department to register for Level II Psychology. They may be admitted to the Honours Psychology programme on completion of Level II, subject to the completion of these requirements, and obtaining a CAA of at least 7.0 or greater in the required Level II Psychology courses.

Programme Notes:

1. When Mathematics is delayed to Level II, then Psychology 2R06 must be deferred to Level III and another 6 units of Psychology must be taken to fulfill that Level II requirement.

   Psychology 2R06 will be included in calculating the Graduation Average, if it is taken after Level II.
2. Students who entered this programme **prior to September 1988**, must complete *either* Psychology 2E03 or 3W06.

   Students who enter this programme **from September 1988**, must complete Psychology 2E03.
3. At some time during the programme, the student must meet a laboratory requirement by completing one of Psychology 3C06, 3E03, 3L03 (formerly 2U03), 3QQ3, 3S03, 3V03, 4G03, 4QQ3.

   Enrolment in Laboratory courses is limited. Permission of the Department must be obtained by March 1.

Area Courses:
Psychology 2E03, 2H03, 2R06, 2T03. All Level III and IV Psychology courses.

Level II: 30 units
R Psychology 2E03, 2H03, 2R06, 2T03; 6 units of courses chosen from the Faculty of Science, excluding Psychology and the Mathematics course taken to meet the Admission requirements (e.g. Mathematics 1K03, 1M03).
E 9 units, at least 6 of which must not be from Psychology. Psychology 3L03 may be taken in Level II.

Level III: 30 units
R 18 units of Level III Psychology, or 12 units of Level III Psychology and Psychology 2R06 (if not completed).
E 12 units, 6 of which must not be from Psychology.

Level IV: 30-31 units
R Psychology 4D06; 12 units of Levels III or IV Psychology.
E 12 units.

PSYCHOLOGY MAJOR (B.A.)

Admission:
Completion of **any Level I** programme with at least a C in Psychology 1A06 and in 6 additional units of Social Sciences or Natural Science, and at least a C− in English 1D06.

Programme Note:
All area courses from Levels II, III, and IV will be included in calculating the Graduation Average.

Area Courses:
Psychology 2A03, 2B03, 2C03, 2E03, 2G03, 2H03, 2R06, 2T03. All Level III and IV Psychology courses except 3Z03 and 4D06.

Level II: 30 units
R Psychology 2G03 or 2R06; 6 units from Psychology 2E03, 2H03, and 2T03; 3 additional units of Level II Psychology; 3 units Level I Mathematics; 6 units from the Faculty of Humanities or the Faculty of Science excluding Psychology.
E Electives excluding Psychology to make a total of 30 units.

Level III: 30 units
R 12 units Level III Psychology; 6 units Humanities or Natural Sciences excluding Psychology.
E 12 units elective excluding Psychology, at least 6 of which must be from Level III or IV.

Level IV: 30 units
R 12 units Level III or IV Psychology; 6 units Humanities or Natural Sciences excluding Psychology.
E 12 units Level III or IV electives excluding Psychology.

B.A. IN PSYCHOLOGY

Admission:
Completion of **any Level I** programme with a grade of at least C− in Psychology 1A06, and at least C− in English 1D06.

Students who did not complete the English requirement in Level I will be admitted to the programme only with the approval of a departmental counsellor and must complete the requirement by the end of Level II.

Area Courses:
All Psychology courses above Level I.

Level II: 30 units
R Psychology 2G03, and 6 units from 2D06, 2E03, 2H03, or 2T03; 3 units of Level II Psychology; Mathematics 1L03, or any other 3 units of Level I Mathematics; 6 units of courses chosen from the Faculty of Science or the Faculty of Humanities, excluding Psychology, English 1D06 (if not completed), and the 3 units of Mathematics required by the programme.
E 9 units, 3 of which must not be from Psychology. Psychology 3L03 may be taken in Level II.

Level III: 30 units
R 12 units of Level III Psychology; 6 units of courses chosen from the Faculty of Science or the Faculty of Humanities, excluding Psychology.
E 12 units, 6 of which must not be from Psychology.

Department of Religious Studies

PROGRAMME NOTE: (Applicable to ***all*** Religious Studies programmes.)

Religious Studies at McMaster includes three major **subfields** of Biblical Studies, Western Religious Traditions, and Asian Religions. Students may concentrate in any one of these subfields though it is not necessary to do so. It should be noted, however, that each subfield has its own sequence of courses and prerequisites. Courses listed below are considered central to the subfield and are strongly recommended for any student wishing such a concentration.

Biblical Studies

Hebrew Bible: Religious Studies 2D06, 2DD3, 2EE3, 3M03

Christianity: Religious Studies 2E06, 2FF6, 3O03, 3T03, 3X03

Western Religious Traditions

Religious Studies 2II3, 2JJ3, 2KK3, 2LL3, 3D03, 3MM3, 3NN3

Asian Religions

Religious Studies 2J06, 2MM6, 3Q06

(For the *Social Scientific Study of Religion*, the following courses are recommended: Religious Studies 3J06, 3JJ6.)

HONOURS ARTS AND SCIENCE AND RELIGIOUS STUDIES (B. Arts Sc.)

(*See Arts and Science Programme*)

HONOURS RELIGIOUS STUDIES

Admission:

Completion of **any Level I** programme with an average of 7.0 in 12 units acceptable to the department, preferably including one of the Level I Religious Studies courses.

Programme Notes:

1. All students are urged to consult a Departmental Advisor concerning their programmes at least once each year.
2. The Graduation Average will be computed on the basis of all Religious Studies courses taken in Levels II, III and IV.
3. Students are required to complete at least 48 units of Religious Studies courses or approved substitutes in Levels II, III and IV as specified as Required (R) below, and at least 18 units of Electives (E) outside Religious Studies.

   Courses from other departments may, with the *written* approval of a Departmental Undergraduate Advisor, be substituted for Religious Studies courses, and will then be designated Area courses.
4. Part-time students should be aware that the required courses in Levels II, III and IV are regularly offered in the evening and/or in the summer. Students who anticipate difficulty in fulfilling departmental requirements should consult a Departmental Undergraduate Advisor as early as possible in their programmes.
5. Students who entered this programme prior to **September 1989**, must complete either Religious Studies 2GG3 or six units from the Eastern Pool (2J06 and 2MM6) and either Religious Studies 2NN3 or six units from the Western Pool (2D06, 2E06, 2FF6, 2II3, 2JJ3, 2K03, 2KK3, 2LL3, 2R06, 2S06, and 2YY6).

Area Courses:

All Level II, III, and IV Religious Studies courses or approved substitutes.

Level II: 30 units

R 12 units of Level II Religious Studies: six units from 2D06, 2E06, 2FF6, 2II3, 2JJ3, 2K03, 2KK3, 2LL3, 2R06, 2S06, and 2YY6; and six units from 2J06, 2MM6.

E Electives to make a total of 30 units.

Level III: 30 units

R At least 18 units, including Religious Studies 3F03; an Undergraduate Advisor will aid each student in the choice of the 15 remaining units. Normally, at least 9 of these 15 units should be Level III Religious Studies courses.

E Electives to make a total of 30 units.

Level IV: 30 units

R At least 18 units, including Religious Studies 4FF3, 4GG3, 6 units of Level IV Advanced Study and 6 additional units of Level II or III Religious Studies courses (or substitute) to be determined in consultation with a Departmental Undergraduate Advisor.

E Electives to make a total of 30 units.

COMBINED HONOURS IN RELIGIOUS STUDIES AND ANOTHER SUBJECT

Programme Notes:

1. Combined Honours students are urged to consult a Departmental Advisor concerning their programmes at least once each year.
2. Students in Combined Honours programmes must complete at least 36 units of Religious Studies courses or approved substitutes in Levels II, III and IV, including Religious Studies 3F03, 4FF3, 4GG3; six units from 2D06, 2E06, 2FF6, 2II3, 2JJ3, 2K03, 2KK3, 2LL3, 2R06, 2S06, 2YY6; and six units from 2J06, 2MM6; nine units of Level III Religious Studies courses; normally six units of Level IV Advanced Study.

B.A. IN RELIGIOUS STUDIES

Admission:

Completion of **any Level I** programme with an average of at least 4.0 in six units of work acceptable to the Department including at least three units of Religious Studies.

Programme Notes:

1. All Religious Studies majors are urged to consult a Departmental Advisor concerning their programmes at least once each year.
2. Students are required to complete at least 30 units of Religious Studies courses or approved substitutes in Levels II and III as specified as Required (R) below, and at least 12 units of Electives (E) outside Religious Studies.

   Courses from other departments may, with the *written* approval of a Departmental Undergraduate Advisor, be substituted for Religious Studies courses and will then be designated Area courses.
3. Part-time students should be aware that required courses in Levels II and III are regularly offered in the evenings and/or in the summer. Students who anticipate difficulty in fulfilling departmental requirements should consult a Departmental Undergraduate Advisor as early as possible in their programmes.
4. Students who entered this programme prior to **September 1989**, must complete either Religious Studies 2GG3 or six units from 2J06 and 2MM6, and either Religious Studies 2NN3 or six units from 2D06, 2E06, 2FF6, 2II3, 2JJ3, 2K03, 2KK3, 2LL3, 2R06, 2S06, 2YY6.

Area Courses:

All Level II, III and IV Religious Studies courses or approved substitutes.

Level II: 30 units

R 12 units of Level II Religious Studies: six units from 2D06, 2E06, 2FF6, 2II3, 2JJ3, 2K03, 2KK3, 2LL3, 2R06, 2S06, 2YY6; and six units from 2J06, 2MM6.

E Electives to make a total of 30 units.

Level III: 30 units

R At least 18 units, including Religious Studies 3F03; an Undergraduate Advisor will aid each student in the choice of the 15 remaining units. Normally, at least 9 of these 15 units should be Level III Religious Studies courses.

E Electives to make a total of 30 units.

School of Social Work

COMBINED B.ARTS SC./B.S.W.

Students interested in this combined programme should consult *both* the Director of the Arts and Science Programme and the Director of the School of Social Work *prior to enrolment in Level I.*

(*See Arts & Science Programme.*)

COMBINED B.A./B.S.W.

Admission:

Completion of **any Level I** programme, including Psychology 1A06 and Sociology 1A06, normally with a University Average of at least 6.0 and evidence of personal suitability, which may be evaluated by one or a combination of written statements, tests, or interviews.

An applicant must complete Level I by April of the year in which application is made.

In choosing Level I courses, the student should take care to include those courses that will allow entry to the B.A. programme. Students should consult the relevant sections of the Calendar and/or the Associate Dean of the Faculty.

Enrolment in the Combined B.A./B.S.W. programme is limited. Students who intend to apply for the combined B.A. and B.S.W. programme must consult the School of Social Work prior to application.

All applications for admission to the School of Social Work are considered annually and must be made **directly to the School well before March 1** for the Fall term.

Applicants **transferring** from other universities (see *Two-tier Applications below*) **must also apply** through the Ontario Universities' Application Centre (OUAC) for full-time study, or through the Associate Registrar (Liaison and Admissions) for part-time study, and are required to meet the introductory Psychology and Sociology prerequisites.

Students admitted to the Combined Programme who have completed B.A. work beyond Level I normally will require three years after admission to complete the programme.

Two-tier Applications

If you are transferring from a university other than McMaster, or a college, you must complete **two** application forms as follows:

1. *General Application (early January)*:

   If you wish to study *full-time*, obtain a 105 application form from the Admissions Office of any Ontario university. Complete the form showing *both* your interest in the BA/BSW programme, and the subject you wish to take for the BA component. The form should be returned to OUAC, with the appropriate fee.

   If you wish to study *part-time*, fill out a McMaster Application form which can be obtained directly from McMaster, at Gilmour Hall, Room 120.

   In order to allow adequate time for the processing of the General Application, applicants are advised to submit their applications **in early January.**

2. *Supplementary Application (March 1)*:

   After the General Application has been received at McMaster, the School of Social Work will mail you a Supplementary Application form, which must be completed and returned directly to the School of Social Work by **March 1.** (To avoid delay, you are advised to request this form personally through direct contact with the School of Social Work.) This form is used to decide when applicants are able to write an admissions test, which is scheduled for two dates in March of each year, both on site and at alternative testing centres outside Hamilton.

   Adequate time is needed to make these arrangements and to complete the admissions process. Therefore, it is *impossible* to consider applicants whose Supplementary Application arrives after the March 1 deadline.

Programme Notes

1. **Course Groupings:** There are **three** groups of courses in the Social Work programme:

   Group I are those which are required core courses;
   Group II are those which are primarily practice oriented;
   Group III are those which are primarily policy oriented. Only Group III courses may be taken for B.A. elective credit by undergraduates not in Social Work. Social Work students must in *each* of Levels III and IV take 6 units from Group III courses for B.A. Elective credit. Permission of the School for Group III courses is required for ***all*** students.

   Group I:
   Social Work 2B06, 2C03, 2D03, 2E03, 3D06, 3DD3, 4D06, 4DD6

   Group II:
   Social Work 3N03, 3O03, 3P03, 3R03, 4G03, 4H03, 4K03, 4O03, 4P03, 4T03, 4V03, 4W03, 4X03, 4Y03

   Group III:
   Social Work 3C03, 3G03, 3H03, 3J03, 4J03, 4M03

2. Continuation Beyond Level I: Students must achieve a minimum grade of C+ in each of Social Work 2B06, 2C03, 2D03, 2E03, 3D06, and 4D06, and a 'Pass' in Social Work 3DD3 and 4DD6, *and* a Cumulative Area average of at least 6.0 in Group I and Group II Social Work courses at each review in order to continue in the programme.

3. Graduation: To qualify for the B.A. and B.S.W. degrees, students must complete a total of at least 48 units of Social Work for credit towards the B.S.W. degree and a total of 90 units of credit towards the B.A. degree.

   The B.S.W. degree will be granted only if the student has achieved a grade of at least C+ in each of Social Work 2B06, 2C03, 2D03, 2E03, 3D06, and 4D06, and a 'Pass' in Social Work 3DD3 and 4DD6, *and* a Cumulative Area average of at least 6.0 in Group I and Group II Social Work courses. Graduation from the three-year B.A. portion of the programme requires a Graduation Average of at least 4.0.

4. Students are expected to assume the cost of travelling to and from field practice agencies.

Area Courses:

Group I and Group II Social Work courses taken for B.S.W. degree.

Level I: 30 units (B.A.)

B.A. courses as prescribed above for admission to the programme.

Level II: 36 units

R Social Work 2B06, 2C03, 2D03 and 2E03, all of which must be completed prior to enrolling in Social Work 3D06 and 3DD3; courses in the corresponding B.A. programme to total 21 units, including Psychology 2A03 which must be completed prior to enrolling in Social Work 3D06 and 3DD3.

Level III: 36 units

R Social Work 3D06 and 3DD3, which must be completed prior to enrolling in Social Work 4D06 and 4DD6; one of Social Work 3N03 or 3R03; and one other Group II Social Work course to total 15 units; courses in the corresponding B.A. programme to total 21 units, of which 6 units must be from Group III Social Work courses for B.A. credit.

Level IV: 36 units

R Social Work 4D06 and 4DD6; one of Social Work 4O03, 4X03; or 4Y03; and one other Group II Social Work course to total 18 units; courses in the corresponding B.A. programme to total 18 units, of which 6 units must be from Group III Social Work courses for B.A. credit.

B.S.W. AS A SECOND DEGREE

Admission:

Completion of an undergraduate degree from a recognized university including *introductory* Psychology and Sociology, (equivalent to the McMaster courses Psychology 1A06 and Sociology 1A06) normally with an average of at least 6.0 or its equivalent, and evidence of personal suitability which may be evaluated by one or a combination of written statements, interviews, or tests.

An applicant is required to complete the prerequisite undergraduate degree work by April of the year in which application is made.

Enrolment in the B.S.W. Second Degree programme is limited. Students who intend to apply for the B.S.W. as a Second Degree programme must consult the School of Social Work prior to application.

All applications for admission to the School of Social Work are considered annually and must be made **directly to the School well before March 1** for the Fall term. Applicants **must also apply** to the University through the Associate Registrar (Liaison and Admissions) for full- or part-time study.

Programme Notes:

1. McMaster Work: Students are required to take courses to total 60 units, all of which must be completed at McMaster. If advanced standing is granted, additional courses must be taken at McMaster to total 60 units.

2. **Course Groupings:** There are **three** groups of courses in the Social Work programme:

   Group I are those which are required core courses;
   Group II are those which are primarily practice oriented;
   Group III are those which are primarily policy oriented. Only Group III courses may be taken for B.A. elective credit by undergraduates not in Social Work. Social Work students must take 12 units from Group III courses. Permission of the School for Group III courses is required for ***all*** students.

   Group I:
   Social Work 2B06, 2C03, 2D03, 2E03, 3D06, 3DD3, 4D06, 4DD6

   Group II:
   Social Work 3N03, 3O03, 3P03, 3R03, 4G03, 4H03, 4K03, 4O03, 4P03, 4T03, 4V03, 4W03, 4X03, 4Y03

   Group III:
   Social Work 3C03, 3G03, 3H03, 3J03, 4J03, 4M03

2. Progression Within Programme: Students must achieve a minimum grade of C+ in each of Social Work 2B06, 2C03, 2D03, 2E03, 3D06, and 4D06, and a 'Pass' in Social Work 3DD3 and 4DD6, *and* a Cumulative Area average of at least 6.0 in Social Work courses at each review in order to continue in the programme.
3. Graduation: To qualify for the B.S.W. as a Second Degree, students must complete a total of 60 units of credit at McMaster. The B.S.W as a Second Degree will be granted only if the student has achieved a grade of at least C+ in each of Social Work 2B06, 2C03, 2D03, 2E03, 3D06, and 4D06, and a 'Pass' in Social Work 3DD3 and 4DD6, *and* a Cumulative Area average of at least 6.0 in Group I and II Social Work courses.
4. Students are expected to assume the cost of travelling to and from field practice agencies.

Area Courses:
All Social Work courses.

Requirements:

R All Group I required Social Work core courses, with a minimum grade of C+, in each of Social Work 2B06, 2C03, 2D03, 2E03, 3D06, and 4D06, a 'Pass' in Social Work 3DD3 and 4DD6, and credit in Psychology 2A03. Students must complete Social Work 2B06, 2C03, 2D03, 2E03, and Psychology 2A03 prior to enrolling in 3D06 and 3DD3. Completion of 3D06 and 3DD3 is a prerequisite for Social Work 4D06 and 4DD6.
one of Social Work 3N03, 3R03;
one of Social Work 4O03, 4X03, 4Y03;
four Group III Social Work courses;
one or two other Group II Social Work courses to total 60 units. (Two courses must be chosen if Psychology 2A03 was completed prior to admission to the B.S.W. Second Degree Programme.)

Department of Sociology

HONOURS ARTS AND SCIENCE AND SOCIOLOGY (B. Arts Sc.)

(See *Arts and Science Programme)*

HONOURS SOCIOLOGY

Admission:
Completion of **any Level I** programme with an average of at least 7.0 in 12 units, including Sociology 1A06 with a grade of at least B−.

Programme Notes:

1. Level IV courses in Sociology may be taken after completion of 60 units beyond Level I or with the permission of the instructor.
   A student may take a maximum of 6 units of Level IV independent research (Sociology 4M03/4N03).
2. Students should check both this Calendar and the Departmental Handbook for prerequisites and course descriptions.

Area Courses:
All Level II, III and IV Sociology courses.

Levels II, III and IV: 90 units

R 48 units of Sociology including: Sociology 2S06 and one of 3A03, 3P03 or 3PP3; Sociology 3H06 and one of 3O03 or 3W03; 30 additional units of Levels II, III and IV Sociology including at least 12 units of Level IV Sociology.

E 42 units.

COMBINED HONOURS IN SOCIOLOGY AND ANOTHER SUBJECT

Admission:
Completion of **any Level I** programme, including a grade of at least B− in each of Sociology 1A6 and 6 units of the other subject.

Programme Notes:

1. With the approval of both departments concerned, students may arrange to follow a Combined Honours programme in Sociology and another subject in the Faculties of Social Sciences and Humanities. The Sociology component of such programmes is described below.
2. The Sociology component of the Graduation Average is computed on all Level II, III and IV Sociology courses.
3. Level IV courses in Sociology may be taken after completion of 60 units beyond Level I or with the permission of the instructor.
   A student may take a maximum of 6 units of Level IV independent research (Sociology 4M03/4N03).

Area Courses:
All Level II, III and IV Sociology courses.

Levels II, III and IV: 90 units

R At least 36 units of Sociology including: Sociology 2S06 and one of 3A03, 3P03 or 3PP3; Sociology 3H06 and one of 3O03 or 3W03; 18 additional units of Level II, III and IV Sociology, including at least 12 units of Level IV Sociology.

B.A. IN SOCIOLOGY

Admission:
Completion of **any Level I** programme, including Sociology 1A06 with a grade of at least C−.

Area Courses:
All Level II, III and IV Sociology courses.

Levels II and III: 60 units

R 24 units of Sociology, including Sociology 2S06 and at least one of Sociology 2Y03, 2Z03 or 3H06.

E 36 units.

Part-time Degree Studies

The University offers a broad range of educational opportunities for students who wish to take degree studies on a part-time basis. In addition to the day time offerings in the Winter and Summer sessions, a wide selection of evening classes is available throughout the year.

Each student taking degree courses will associate with one of the undergraduate faculties (Business, Humanities, Science or Social Sciences). By so doing, students will have the opportunity to consult with the academic counsellors of their Faculty, and with the departments concerned with the interests in which they wish to develop further study. If their interests change, it is often possible to transfer to another department or Faculty.

The courses which part-time students take in the early stages of their education will form the basis for choosing their programme of study. The Level I courses will give them the information they need for this purpose, as well as provide the prerequisites for more advanced courses and admission to programmes of study. The programmes of study which are available entirely through evening and summer courses are indicated on the chart *Degrees by Programme*, in the *Degrees and Programmes* section of this Calendar.

There are specific regulations that part-time students should be aware of. They are decribed below. Students should **also** familiarize themselves with the requirements and information found in this Calendar in the following sections: *Admissions*, *Academic Regulations* and *Sessional Dates* **as well as** the programame descriptions found in the specific Faculty sections.

ADMISSION

Before you can register for any course or programme, you must apply for admission to the University. Applicants who satisfy the normal admission requirements of the University may choose to register for part-time study. Those who do not satisfy these requirements may be admissible as *Special Students* and given the opportunity to show that they can deal successfully with university work. Initially, *Special Students*, with the approval of the appropriate Associate Dean (Studies), may take only 6 units of work per session until 12 units are completed.

Students who do not wish to enter a degree programme, but would like to take a course for credit, may be admissible as *Occasional Students* under the same conditions as apply to *Special Students*. Such students may subsequently transfer to a degree programme. If the courses already completed were relevant to the programme, then they could be counted towards the degree requirements.

Many part-time students enter degree study from other forms of post-secondary education. Students who want to inquire regarding credit recognition for work taken in non-degree programmes (e.g. diploma, certificate, CAAT) should contact the appropriate Faculty Office.

Please refer to the section *Admission Requirements* for details about the various avenues for admission to study at McMaster.

AVAILABILITY OF COURSES

Although both daytime and evening courses are open to all students, part-time students often have other responsibilities which restrict them to the courses offered in the evenings, winter and summer. We have, therefore, listed the 1989/90 Winter Evening courses which the University intends to offer on the main campus as well as an indication of projected course offerings for the February to July Evening and Summer Day Sessions for 1990. This schedule is part of a longer plan which has been designed to make available the required courses for a number of the three level programmes, and some of the Honours programmes, over a five or six-year period. For those who can arrange to take day courses, the options are greatly enlarged. Announcements concerning course offerings planned primarily for part-time students will be made from time to time through separate Part-Time Degree Studies brochures.

CO-ORDINATOR OF PART-TIME DEGREE STUDIES

The **Co-ordinator** of Part-time Degree Studies, Mr. Gordon Raymond or his Assistant, Ms. Tina Horton, may be telephoned at 525-9140, extension 4325 or 4324 respectively, Gilmour Hall Room 103, for counselling and to discuss preparation and plans for degree study. His office is open in the day, and in the evening by appointment. More detailed information concerning programmes and courses is provided by the Academic **Counsellors** within each Faculty as follows:

Business: extension 4432
Humanities: extension 4326
Science: extension 2612
Social Sciences: extension 4604

Information about **application procedures and admission regulations** is available through the Admissions Office (525-9140, ext. 4796, Gilmour Hall, Room 120).

Information about **non-degree courses and programmes**, including courses for pre-university upgrading is available through the Centre for Continuing Education (525-9140, ext. 4321).

OFF-CAMPUS CENTRES

In addition to the courses scheduled for the main campus, the University offers evening courses through the year in Brantford, Burlington, Oakville and Stoney Creek. These courses are *not* included in this listing.

In co-operation with the Mohawk College of Applied Arts and Technology, the University operates an Education Information Centre in downtown Hamilton and supports the Brantford Information Centre, which is directed by the Council for Continuing Education for Brantford and Brant County. These centres exist to provide information and assistance in career planning for persons of all ages and maintain comprehensive collections of Calendars and brochures concerning educational opportunities across Canada. The staff of these centres are also familiar with McMaster's programmes and can either assist you directly or help you to make contact with the appropriate persons at McMaster.

The Centre in Hamilton is in the Hamilton Central Library just off Jackson Square, telephone (416)525-9140, extension 2020.

The Information Centre in Brantford is located at 99 Chatham Street, Brantford, N3T 2T3, telephone (519)753-3171.

MAPS

The McMaster Assocation of Part-time Students (MAPS) maintains an office and student lounge in Room 102 of Kenneth Taylor Hall, telephone 525-9140, extension 2021 and publishes a newsletter, *Link*, which is sent to all part-time students. The coffee lounge is open day and evening from Monday to Thursday, and Friday during the day. MAPS Executive Director, Ms. Judy Worsley, is available during these hours to help students. All part-time students are invited to use these facilities and to assist their Association in its efforts to improve the quality and range of educational opportunities available to students who can only attend university in the evening.

Schedule of Courses

The following plan of programmes and courses is a projection only. It is subject to change according to the availability of instructors and adequate resources.

Specific dates and examination times may be found in the section *Sessional Dates* in this Calendar.

Courses are arranged alphabetically by department. The various sessions in which courses are offered are identified by the following code:

Session	Code
Winter Evening, 1989-90	W
February/July Evening, 1990	A★
February/April Evening, 1990	B★
May/July Evening, 1990	C★
May/June Evening, 1990	D★
June/July Evening, 1990	E★
Summer Day, 1990	S

First- and second-term Winter Evening Session and Summer Day Session offerings are identified by a 1 or 2, following the letter code, respectively, while a 3 indicates a course that runs throughout both terms of the Winter or Summer Session. An x indicates that the term within the session has not yet been determined.

★ As of the printing of this Calendar, projections for the February to July terms are tentative and subject to changes. Please refer to the sessional brochures prior to the February to July Session for full information on course offerings.

ANTHROPOLOGY

1A03	Introduction to Anthropology: Culture and Society	W1, E, S2
1B06	The Study of Language	W3
1Z03	Introduction to Anthropology: Human and Cultural Origins	W2, D, S1
2A03	World Prehistory: Paleolithic	D or E
2C03	Communal Societies	Wx
2D03	Genetics and Evolution	D or E
2E03	Physical Anthropology	Wx
2F03	Social Anthropology	W1
2G03	Folklore Studies	Wx
2J03	Human Growth and Adaptation	D or E
2K03	Social Biology	D or E
2KK3	Myth	D or E
2O03	New World Prehistory	Wx
2Q03	Linguistics and the Study of Culture	Wx
2R03	Religion, Magic and Witchcraft	Wx
2S03	The Peoples of the Soviet Union	D or E
2Y03	Honours Seminar	Wx
2V03	Aztecs, Maya and Inca	Wx
3A03	Ethnology: The Canadian North	W1
3B03	Ethnology: Europe	D or E
3D03	Ethnology: Pacific Islands	D or E
3F03	Contemporary Northern Peoples	W2
3L03	Primitive Systems of Thought	Wx
3N06	Human Evolution	W3
3Q03	Anthropological Approaches to the Study of Aging	Wx
3T03	Competition and Conflict	D or E
3X03	People of India	Wx
3ZZ3	Medical Anthropology: Symbolic Healing	Wx
4B03	Current Problems in Anthropology	Wx
4I03	Contemporary Anthropological Theory	Wx

ART

Consult Sessional Brochures for further information on course offerings in *Art*.

ART HISTORY

2R03	The Art of the Northern Renaissance: 1400-1580	Wx
2X06	The Art of the Film	W3
3AA3	Contemporary Art	Wx
3L03	Venetian Renaissance Painting	Wx
4W03	Modern Landscape Art	Wx

BUSINESS

3V03	Business Law	W1
3W06	Accounting	W3
3Y03	Marketing	W1

CHINESE

1Z06	Beginner's Intensive Chinese	W3

CLASSICAL CIVILIZATION

Consult Sessional Brochures for full information on course offerings in *Classical Civilization*.

COMMERCE

2AA3	Financial Accounting	W1
2BA3	Organizational Behaviour	W1
2QA3	Computer-Augmented Statistical Analysis	W2
3AB3	Financial Accounting	D or E
3MA3	Introduction to Marketing Research	W2
3QA3	Decision Science for Managers	W1
4BD3	Settlement of Industrial Disputes	W2
4PB3	Taxation	D or E
4PD3	Commercial Law	D or E

COMPARATIVE LITERATURE

Consult Sessional Brochures for full information on course offerings in *Comparative Literature*.

COMPUTER SCIENCE

1MA3	Introduction to Computer Programming	W1
1ZA3	Introduction to Computing and Computer Use	W2
4I03	Management Information Systems	Wx

CROATIAN

2C03	The Early Cultural Heritage	Wx
3C03	Contemporary Croatian Culture	Wx

DRAMA

1A06	Introduction to Drama	W3
2X06	The Art of Film	W3
3K06	Shakespeare	W3
3PP3	Plays in Performance	Sx

ECONOMICS

Consult Sessional Brochures for further information on course offerings in *Economics*.

ENGLISH

1D06	Literature in English: Forms and Approaches	W3, A, C
2C03	Contemporary Canadian Fiction	Wx
2F03	Studies in American Literature	Wx
2R03	Topics in Restoration and 18th Century Literature	D or E
3D03	The Earliest English Literature	W1
3DD3	Beowulf	W2
3E03	Shakespeare: Selected Plays	Wx
3K06	Shakespeare	W3
3V06	Studies in 17th Century Literature	C
3X03	Topics in 20th-Century Literature I	Wx
3XX3	Topics in 20th-Century Literature II	D or E
4L03	Romantic Poetry	Wx
4M03	Victorian Poetry	Wx

FRENCH

1B06	Intermediate French	W3, S3
1Z06	Beginner's Intensive French	W3, A
2A03	French Language Practice	W3
2C03	French Language Practice: Oral	W3
2W03	Twentieth Century French Literature I	Wx
3C03	French Language Practice: Written	W3
3F03	French Language Practice: Oral	W3
3Q03	Seventeenth-Century French Literature I	Wx
4U03	Topics in French-Canadian Literature	Wx

Consult Sessional Brochures for further information on course offerings in *French*.

GEOGRAPHY

2C03	China: People and Land in Transition	W1
2K03	Introduction to Soil and Land Use Studies	W2
3G03	Population Growth and Distribution	W1
3P03	Biogeography: Distribution of Plants and Animals	W2

Consult Sessional Brochures for full information on course offerings in *Geography*.

GERMAN

1Z06	Beginner's Intensive German	W3
2Z06	Intermediate Intensive German	W3

Consult Sessional Brochures for full information on course offerings in *German*.

GERONTOLOGY

1A06	Introduction to Gerontology	W3, C
2A03	Multidisciplinary Issues in Gerontology	W1
3A03	International Aspects of Gerontology	W1
3B03	Gerontology Field Experience	D or E
3C03	Research Methods in Social Gerontology	D or E
4B03	Communication and Counselling with Older Adults	W2
4C03	Special Topics in Gerontology	W1, D or E

GREEK

Consult Sessional Brochures for full information on course offerings in *Greek*.

HISPANIC STUDIES

1Z06	Beginner's Intensive Spanish	W3

Consult Sessional Brochures for full information on course offerings in *Hispanic Studies*.

HISTORY

1C06	The Modern World: The Era of European Primacy	W3
1D06	The Civilization of the West	W3, C
2B06	China: From the Opium Wars to the Present	W3
2H06	United States History	W3, C
2J06	The History of Canada	W3, C
2N06	British History 1500 to the Present	W3
3H06	The History of Modern Russia	C
3J06	Germany and Austria from the Hapsburgs to Hitler	W3
3JJ3	Crime, Criminal Justice and Punishment in Modern History	Wx
3N03	Canadian Working Class	Wx
3R03	Religion and Politics in the Age of Reformation	Wx
3RR3	War and Society in 20th Century Britain	Wx
4P06	Contemporary Europe	W3
4Q06	Special Topics in the History of Medieval Europe and Byzantium	W3

HUMANITIES

3B06	From Romanticism to Modernism	W3

ITALIAN

1Z06	Beginner's Intensive Italian	A

Consult Sessional Brochures for full information on course offerings in *Italian*.

JAPANESE

1Z06	Beginner's Intensive Janpanese	W3

LABOUR STUDIES

1AA3	An Introduction to Labour Studies	Wx
1A03	The Canadian Labour Movement	Wx
2A06	Trade Unions	W3
2B03	Social Welfare	W1
2BB3	Social Welfare	W2
3A06	Current Labour Issues	W3
3C03	Labour Law and Policy	W1

Consult Sessional Brochures for full information on course offerings in *Labour Studies*.

LINGUISTICS

1A06	The Study of Language	W3

MATHEMATICS

1A06	Calculus I	W3, A, C
1B03	Linear Algebra I	W1, D or E
1K03	Introductory Calculus for Business and the Social Sciences	W1, D or S1
1L03	Linear Algebra and Probability for Business and the Social Sciences	W1, D or E
1M03	Calculus for Business and the Social Sciences	W2, E or S2
2G03	Intermediate Calculus	W1
2O03	Differential Equations	W2

Consult Sessional Brochures for full information on course offerings in *Mathematics*.

MUSIC

2A06	History of Music (CA. 1750 to the Present)	W3
3A03	Music Education I	W1
3AA3	Music Education II	W2

PHILOSOPHY

2A06	Ancient Greek Philosophy	C
2C06	Philosophy During the Scientific Revolution	W3
2F03	Philosophical Psychology	D or E
2H03	Aesthetics	Wx
2N03	Business Ethics	Wx
2R03	Reasoning	D or E
3A06	From Kant to Hegel	W3
3H03	Philosophy of Religion	Wx
3J03	Aristotle	Wx

PHYSICAL EDUCATION

3P03	Sport and Social Processes	W1
3SS3	Body, Mind and Spirit	W2

POLITICAL SCIENCE

1A06	An Introduction to the Study of Politics	W3,
2E06	International Relations	W3
2F06	The Systematic Study of Politics	W3
3FF3	Canadian Foreign Policy	Wx
3O06	Modern Political Thought	W3
3Z06	Public Administration	W3
4Q06	Developing Areas	W3

Consult Sessional Brochures for full information on course offerings in *Political Science*.

PSYCHOLOGY

1A06	General Psychology	W3, A, S3
2A03	Theories of Human Development	Wx
2B03	Personality	Wx
2C03	Introduction to Social Psychology	Wx
2E03	Sensory Processes	Wx
2H03	Human Learning and Cognition	Wx
2R06	Research Design and Statistics for Psychologists	W3
2T03	Principles of Conditioning	Wx
3B03	Psychopathology	W1
3G03	Development During Infancy	Wx
3H03	Intellectual Development After Infancy	Wx
3L03	Laboratory in Animal Conditioning	Wx
3X03	Selected Topics in Behaviour Modification	Wx
3Z03	Research Methods in Psychology	W1
4B03	History of Psychology	Wx

Consult Sessional Brochures for full information on course offerings in *Psychology*.

RELIGIOUS STUDIES

1D06	The Modern Study of the Bible	W3
1E06	Ideas of Love	W3
2A06	Death and Dying in Human Experience	W3
2BB3	Images of the Divine Feminine	W1
2CC3	Specialists in the Sacred	W1
2J06	India: Its Culture, Social History, Religion and Philosophy	W3
2KK3	Christianity in the 16th Century	W1
2L03	Life, Work and Teachings of Mahatma Gandhi	W1
2QQ3	Cults in North America	W1
2SS3	Women and Religion	W2
2S06	Modern Judaism	W3
2T03'	Yoga: Theory and Practice	W2
2WW3	Health, Healing, and Religion	W2
2YY6	The Jewish-Christian Encounter: An Historical Survey	W3
3AA3	Popular Religion in India	W2
3B03	Native and Ethnic Religions in Canada	W2
3F03	Approaches to the Study of Religion	W2
3MM3	Scepticism, Atheism, and Religious Faith	W2
3O03	The Fourth Gospel	W1
3SS3	Body, Mind and Spirit	W2
3XX3	Civil Religions, East and West	W1
4FF3	Approaches to the Study of Religion	W1
4GG3	Honours Seminar	W2

SCIENCE

Consult Sessional Brochures for full information on course offerings in *Science*.

SOCIAL WORK

2B06	Social Welfare-General Introduction	W3
2C03	Theory for Social Work Practice	Wx
2D03	Interpersonal Communication and Interviewing	Wx
2E03	Human Growth and Development in the Social Environment	Wx
3C03	Social Aspects of Health and Disease	Wx
3J03	Technology and Social Welfare	Wx
3N03	Selected Theories of Social Work Intervention	Wx

Consult Sessional Brochures for full information on course offerings in *Social Work*.

SOCIOLOGY

1A06	An Introduction to Sociology	W3, A, C, S3
2C06	Deviant Behaviour	W3
2D06	The Human Group	C
2E06	Racial and Ethnic Group Relations	C
2I03	The Sociology of Organizations I	W1
2O06	Social Stratification	W3
2P06	The Sociology of Education	C
2Q06	Sociology of Women	W3
2S06	Introduction to Sociological Theory	W3
2U06	Sociology of the Family	W3
2Y03	Introduction to Quantitative Studies	Wx
2Z03	Introduction to Sociological Research	W1, W2
3D03	Special Topics in the Sociology of the Family	Wx
3G03	Sociology of Health Care	Wx
3H06	Research Techniques and Data Analysis	W3
3HH3	Sociology of Health	Wx
3I03	Sociological Inquiry	Wx
3LL3	Sociology of Work and Labour Markets	Wx
3P03	American Sociological Theory	Wx
3X03	Sociology of Aging	Wx
3Y03	The Sociology of Organizations II	Wx

Consult Sessional Brochures for full information on course offerings in *Sociology*.

SPANISH

(See Hispanic Studies)

STATISTICS

Consult Sessional Brochures for full information on course offerings in *Statistics*.

Course Listings

Anthropology

Faculty as of January 15, 1989

David R. Counts/*Chairman*

Professors Emeriti

Ruth S. Landes/M.S.W. *(New York)*, Ph.D. *(Columbia)*
Richard Slobodin/B.A., M.S. *(City College of New York)*, Ph.D. *(Columbia)*

Professors

John J. Colarusso/B.A. *(Cornell)*, M.A. *(Northwestern)*, Ph.D. *(Harvard)*
David R. Counts/B.A. *(Texas)*, PH.D. *(Southern Illinois)*
David J. Damas/A.B. *(Toledo)*, A.M., Ph.D. *(Chicago)*
Harvey Feit/B.A. *(Queens)*, M.A. Ph.D. *(McGill)*
Edward V. Glanville/B.A., Ph.D. *(Dublin)*
Christopher Hallpike/B. Litt. *(Oxford)*, D.Phil. *(Oxford)*
William C. Noble/B.A. *(Toronto)*, Ph.D. *(Calgary)*
Richard J. Preston/M.A., Ph.D. *(North Carolina)*

Associate Professors

Matthew Cooper/B.A. *(Brooklyn College)*, M.Phil., Ph.D. *(Yale)*
Klaus Jacklein/Ph.D. *(Tuebingen)*/part-time
Peter G. Ramsden/B.A. *(Toronto)*, M.A. *(Calgary)*, Ph.D. *(Toronto)*
William L. Rodman/B.A. *(Sydney)*, M.A., Ph.D. *(Chicago)*
Charles E. Stortroen/A.B. *(Luther)*, M.A. *(Minnesota)*
Shelley Saunders/B.A., M.A., Ph.D. *(Toronto)*

Assistant Professors

Laura Finsten/B.A. *(Western)*, M.A. *(Calgary)*, Ph.D. *(Purdue)*

Associate Members

Ellen Badone/(Religious Studies) B.A., M.A. *(Toronto)*, Ph.D. *(California, Berkeley)*
Susan Pfieffer/(University of Guelph) B.A. *(Iowa)*, M.A., Ph.D. *(Toronto)*

Department Notes:

1. Not all Anthropology courses listed in this Calendar are taught every year. Students are advised to consult the department's brochure and the timetable which is published annually by the Registrar's Office to determine whether a course is offered.
2. The department offers three Level I Anthropology courses. Anthropology 1A03 and 1Z03, taken together, are designed to provide an introduction to the study of Anthropology.
   Anthropology 1B06 introduces the study of language as a sub-discipline of Anthropology.
3. Registration in all courses marked ★★ listed as selected topics, independent research, individual readings, and honours essays requires written permission of the Department. Registration with appropriate permission must be completed no later than the last day for registration as stated in this Calendar under *Sessional Dates.*
4. To identify Anthropology courses by subdiscipline, students should refer to the lists of courses under *Programme Notes* in the section *Faculty of Social Sciences, Department of Anthropology.*

ANTHROP 1A03 INTRODUCTION TO ANTHROPOLOGY: CULTURE AND SOCIETY
A general introduction to the study of human culture and society in all of its aspects. Examples and illustrations will be drawn largely from non-Western societies.
3 hrs.(lects. and discussion); one term
Prerequisite: Open.

ANTHROP 1B06 THE STUDY OF LANGUAGE
A far-reaching survey intended to acquaint the student with the numerous disciplines that deal with language and many of the crucial concepts and techniques developed within them.
3 hrs.(lects. and discussion); two terms
Prerequisite: Open..
Same as Linguistics 1A06.

ANTHROP 1Z03 INTRODUCTION TO ANTHROPOLOGY: HUMAN AND CULTURAL ORIGINS
Emphasis will be on the evolution of man as seen in the fossil record and on the growth and development of human societies in prehistoric times.
3 hrs.(lects. and discussion); one term
Prerequisite: Open, except to students with credit in Anthropology 1A06, 1F03, or 1G03.

ANTHROP 2A03 WORLD PREHISTORY: PALEOLITHIC
A study of human cultures and societies during the Pleistocene, from approximately 2 million to 8000 years ago.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1Z03; or permission of the instructor. Not open to students with credit in Anthropology 2A06.

ANTHROP 2B03 NATIVE PEOPLES OF NORTH AMERICA
A comparative study of selected cultures of this continent, dealing with traditional and modern situations.
3 hrs.(lects. and discussion); one term
Prerequisite: Open. Not open to students with credit in Anthropology 3C03.

ANTHROP 2C03 COMMUNAL SOCIETIES
Comparative study of communal societies emphasizing conditions giving rise to them and practices and beliefs which sustain them.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1A03.

ANTHROP 2D03 GENETICS AND EVOLUTION
Introduction to basic genetics and the operation of microevolutionary processes on human populations.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 2E03; or permission of the instructor.

ANTHROP 2E03 PHYSICAL ANTHROPOLOGY
An introduction to the study of human evolution, evolutionary mechanisms, and variability in living species of human and non-human primates.
3 hrs.(lects. and discussion); one term
Prerequisite: Six units of Level I Anthropology; or permission of the instructor.
This course is a prerequisite for advanced courses in Physical Anthropology.

ANTHROP 2F03 SOCIAL ANTHROPOLOGY
An introduction to the anthropological concepts and theory underlying the comparative study of the social institutions of non-literate peoples.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1A03; or permission of the instructor.
This course is required of all students registered in B.A. or Honours Anthropology in Level II.

ANTHROP 2G03 FOLKLORE STUDIES
The systematic study of oral traditions, folktales, folksongs, jokes, riddles, etc., as well as customs transmitted by oral traditions.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1A03; or permission of the instructor.

ANTHROP 2H03 ECOLOGICAL ANTHROPOLOGY
An introduction to the study of the interdependence of human societies and their physical and biological environments in anthropological perspective.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1A03; or permission of the instructor.

ANTHROP 2I03 HISTORY OF ANTHROPOLOGY
Some of the major developments and personalities in the history of anthropology as a discipline, with emphasis upon the English-speaking world.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1A03; or permission of the instructor.

ANTHROP 2J03 HUMAN GROWTH AND ADAPTATION
Variation in body form and composition examined in the context of growth, evolutionary development and environmental adaptation.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 2E03; or permission of the instructor.

ANTHROP 2K03 SOCIAL BIOLOGY
Bio-social anthropology. The biological and evolutionary background of human social behaviour.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1Z03; or permission of the instructor.

ANTHROP 2KK3 MYTH
Major definitions and theories of myth are discussed in conjunction with primary readings from mythological texts.
2 lects., 1 tut., one term
Prerequisite: Open
Same as Religious Studies 2K03.

ANTHROP 2L03 PHONETICS
A study of the sounds of language and the articulatory capabilities of man.
3 hrs.(lects.); one term
Prerequisite: Open
Same as Linguistics 2L03.

ANTHROP 2M03 PHONOLOGY
A study of the patterns of distinctive sounds in the world's languages.
3 hrs.(lects.); one term
Prerequisite: Anthropology or Linguistics 2L03, or permission of the instructor.
Same as Linguistics 2M03.

ANTHROP 2N03 WORLD PREHISTORY: NEOLITHIC CULTURES
A survey of the development of settled, food- producing human cultures from earliest villages to urban life.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1Z03; or permission of the instructor.

ANTHROP 2O03 NEW WORLD PREHISTORY
A survey of the prehistory of the Americas, from the first traces of human occupation until the arrival of Europeans.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1Z03; or permission of the instructor.

ANTHROP 2P03 PEOPLES OF THE PACIFIC
An introduction to the ways of life and thought in Pacific island societies. The course will emphasize the material culture, networks of social relations, and systems of belief, of the peoples of Melanesia, Polynesia, and Micronesia.
3 hrs.(lects. and discussion); one term
Prerequisite: Open

ANTHROP 2Q03 LINGUISTICS AND THE STUDY OF CULTURE
A study of the rise of analytical thinking as a distinct mode of thought, the use of such thinking in structural linguistics and its extension to structuralism as practised in anthropology and other disciplines. The work of Levi-Strauss will be examined.
3 hrs.(lects. and discussion); one term
Prerequisite: Registration in at least Level II of any programme.
Same as Linguistics 2Q03.

ANTHROP 2R03 RELIGION, MAGIC, AND WITCHCRAFT
An introduction to the cross-cultural study of the relationship between the natural and supernatural, and between ideology and social action.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1A03; or permission of the instructor.

ANTHROP 2S03 THE PEOPLES OF THE SOVIET UNION
This survey course will acquaint the student with the ethnology, languages and histories of the multifarious peoples spanning the present-day Soviet Union and neighbouring territories. Where possible, historical accounts of particular groups will be given, from remote antiquity to the present, and accounts of long-vanished peoples and civilizations will be presented.
3 hrs.(lects.); one term
Prerequisite: Open

ANTHROP 2T03 SELECTED TOPICS IN ANTHROPOLOGICAL LINGUISTICS
An examination of Chomsky's generative theory of language and a critical assessment of its prospects as a new paradigm for mind and culture.
3 hrs.(lects.); one term
Prerequisite: Anthropology 2Q03 or Linguistics 2Q03; or permission of the instructor.
Same as Linguistics 2T03.

ANTHROP 2V03 THE AZTECS, MAYA AND INCA
A survey of these three great prehistoric New World civilizations, using archaeological, ethnohistoric and colonial information. Topics will include religion, social structure, political and economic organization, as well as the similarities and differences among the Aztecs, Maya and Inca.
3 hrs.(lects.); one term
Prerequisite: Open.

ANTHROP 2W03** SPECIAL TOPICS IN ANTHROPOLOGY
Reading and discussion of selected topics in Anthropology.
One term
Prerequisite: Written permission of the supervising professor.
This course may be repeated in Level II, if on a different topic, to a total of six units.

ANTHROP 2X03 WARFARE AND AGGRESSION
The aim of the course is to assess the extent to which violence is both controlled by and an expression of society and culture.
3 hrs.(lects. and discussion); one term
Prerequisite: Open.

ANTHROP 2Y03 HONOURS SEMINAR
This course will give students the opportunity to develop skills in critical thinking and in communicating their ideas by emphasizing individual work in a seminar format. Topics will vary from year to year.
3 hrs.(lects. and discussion); one term
Prerequisite: Registration in Level II or III Honours Anthropology; or permission of the instructor.

ANTHROP 2Z03 INTRODUCTION TO SOCIAL RESEARCH
This course is designed to develop those skills necessary to pursue and understand research. Several general methods of sociological research will be examined.
3 hrs.(lects. and discussion); one term
Prerequisite: Registration in Honours or B.A. Anthropology and Anthropology 1A03; or permission of the instructor.
Same as Sociology 2Z03.
Enrolment is limited.

ANTHROP 3A03 ETHNOLOGY: THE CANADIAN NORTH
A comparative ethnological analysis of selected societies in the Canadian North.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1A03 and 3 other units of Social/Cultural Anthropology; or permission of the instructor.

ANTHROP 3B03 ETHNOLOGY: EUROPE
A comparative ethnological survey of selected societies in Europe.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1A03 and 3 other units of Social/Cultural Anthropology; or permission of the instructor.

ANTHROP 3D03 ETHNOLOGY: PACIFIC ISLANDS
Analysis of selected issues in Pacific anthropology.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 2P03; or permission of the instructor.

ANTHROP 3F03 CONTEMPORARY NORTHERN PEOPLES
An examination of native-white interaction in northern Canada with an emphasis on present day events.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1A03 and 3 other units of Social/Cultural Anthropology; or permission of the instructor.

ANTHROP 3G03 COMPARATIVE MYTHOLOGY
An examination of some of the major anthropological attempts to explain the existence and meaning of myth.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1A03 and 3 other units of Social/Cultural Anthropology; or permission of the instructor.

ANTHROP 3H03 ETHNOLOGY: SOUTHEAST ASIA
A comparative ethnological survey of selected societies in Southeast Asia.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1A03 and 3 other units of Social/Cultural Anthropology; or permission of the instructor.

ANTHROP 3I03 SYNTAX
A study of the human capacity to form words into sentences. Emphasis will be on generative transformational grammar.
3 hrs.(lects.); one term
Prerequisite: Open
Same as Linguistics 3I03.

ANTHROP 3J03 ADVANCED SOCIAL ANTHROPOLOGY
Further study of the topics introduced in Anthropology 2F03.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 2F03; or permission of the instructor.

ANTHROP 3JJ6 ANTHROPOLOGY OF RELIGION
Survey and evaluation of theoretical perspectives employed by anthropologists in the study of religion. Specific ethnographic examples will be drawn primarily, but not exclusively, from non-Western cultures.
2 lects., 1 tut.: two terms
Prerequisite: Open
Same as Religious Studies 3JJ6.

ANTHROP 3K03 ARCHAEOLOGICAL METHODS
Technique and methodology in the investigation of archaeological material.
3 hrs.(lects. and discussion); one term
Prerequisite: Three units of Level II Archaeology courses; or permission of the instructor.
Enrolment is limited.

ANTHROP 3L03 PRIMITIVE SYSTEMS OF THOUGHT
Selected studies in religion, magic, and systems of knowledge in the cultures of non-literate peoples, and their expression in myth and ritual.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1A03 and 3 other units of Social/Cultural Anthropology; or permission of the instructor.

ANTHROP 3M03 MORPHOLOGY AND SEMANTICS
The study of word formation and patterns of meaning in language.
3 hrs.(lects.); one term
Prerequisite: Anthropology 3I03 or Linguistics 3I03; or permission of the instructor.
Same as Linguistics 3M03.

ANTHROP 3N06 HUMAN EVOLUTION
A general consideration of evolutionary trends within the Order Primates. Special emphasis is given to the evolution of the hominids.
3 hrs.(lects. and discussion); two terms
Prerequisite: Anthropology 2E03; or permission of the instructor.

ANTHROP 3O06 HUMAN OSTEOLOGY
Identification and analysis of the bones of the human skeleton, with a consideration of disease processes that have affected earlier populations.
3 hrs.(lects and discussion); two terms
Prerequisite: Anthropology 2E03; or permission of the instructor.

ANTHROP 3P03 RESEARCH METHODS IN CULTURAL ANTHROPOLOGY
Methodologies and techniques of research, especially field study, in sociocultural anthropology.
3 hrs.(lects. and discussion); one term
Prerequisite: Registration in Level II or III of any Anthropology programme; or permission of the instructor.

ANTHROP 3Q03 ANTHROPOLOGICAL APPROACHES TO THE STUDY OF AGING
An examination of the contribution of anthropology to the study of aging with an emphasis on cross-cultural comparisons, and including an assessment of the anthropological literature relating to the biological basis of aging in modern and prehistoric populations.
3 hrs. (lects. and discussion); one term
Prerequisite: Anthropology 1A03 and 3 other units of Social/Cultural Anthropology, or registration in any programme in Gerontology; or permission of the instructor.
Same as Gerontology 3Q03.

ANTHROP 3S06 THE HISTORY OF ANTHROPOLOGICAL THEORY
The development of anthropology as a discipline, with emphasis upon the emergence and refinement of concepts concerning culture, social structure, and sociocultural change.
3 hrs.(lects. and discussion); two terms
Prerequisite: Anthropology 2F03; or permission of the instructor.
This course is required of all students registered in Honours Anthropology.

ANTHROP 3T03 COMPETITION AND CONFLICT
Focus is on the comparative study of political processes and the role which conflict and competition play in social life.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1A03 and 3 other units of Social/Cultural Anthropology.

ANTHROP 3U03 CANADIAN PREHISTORY
A study of the development of native Canadian cultures prior to the arrival of Europeans.
3 hrs.(lects. and discussion); one term
Prerequisite: Three units of Level II Archaeology courses; or permission of the instructor.

ANTHROP 3V03 COMPARATIVE ECONOMIC ORGANIZATION
An examination of contrasting types of economic organization, with particular reference to societies with a non-industrial base.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1A03 and 3 other units of Social/Cultural Anthropology; or permission of the instructor.

ANTHROP 3W03** SPECIAL TOPICS IN ANTHROPOLOGY
Reading and discussion of selected topics in Anthropology.
One term
Prerequisite: Written permission of the supervising professor.
This course may be repeated in Level III, if on a different topic, to a total of six units.

ANTHROP 3X03 PEOPLE OF INDIA
Discussion of the ethnology, archaeology, and physical anthropology of selected societies in India.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 1A03 and 3 other units of Social/Cultural Anthropology.

ANTHROP 3Y03 HISTORICAL LINGUISTICS
An advanced course covering the techniques for reconstructing ancestral languages. Language families, cognate sets, sound laws, internal and comparative reconstruction, and mechanisms of change will be treated.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 2L03 and 2M03, or Linguistics 2L03 and 2M03; or permission of the instructor.
Same as Linguistics 3Y03.

ANTHROP 3Z03 MEDICAL ANTHROPOLOGY: THE BIOMEDICAL APPROACH
Patterns of stress and disease with emphasis on the modern biomedical approach. Disease in the evolutionary context with emphasis on disease as a failure of adaptation and response.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 2E03 or 2F03; or permission of the instructor.

ANTHROP 3ZZ3 MEDICAL ANTHROPOLOGY: SYMBOLIC HEALING
An interdisciplinary approach to traditional systems of healing such as Greek humoural medicine, Chinese, Shamanic, etc. Emphasis will be on cultural and psychological parameters of healing.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 2E03 or 2F03; or permission of the instructor.

ANTHROP 4A03 THEORIES OF SOCIAL EVOLUTION
The various theories of social evolution from classical to modern times, but with special attention to Spencer, Marx, sociobiology, and modern anthropological works.
3 hrs.(lects. and discussion); one term
Prerequisite: Six units of Level II or Level III Anthropology, including 2F03; or permission of the instructor.

ANTHROP 4B03 CURRENT PROBLEMS IN ANTHROPOLOGY
The topic varies with each instructor (e.g. one class may examine *Urban Anthropology* and another focus on *Recent Advances in Genetics*). Consult the department office for topics prior to registration.
3 hrs.(seminar); one term
Prerequisite: Registration in Level IV Honours Anthropology; or permission of the instructor.
This course may be taken twice in one term with different instructors.

ANTHROP 4E03 ADVANCED REGIONAL ARCHAEOLOGY
A study of the field data, methods, and theoretical problems, in the prehistory of selected areas.
3 hrs.(seminar); one term
Prerequisite: Three units of Level III Archaeology courses; or permission of the instructor.

ANTHROP 4F03 ARCHAEOLOGICAL THEORY
A seminar in current topics and issues in archaeology.
3 hrs.(lects. and discussion); one term
Prerequisite: Three units of Level III Archaeology courses; or permission of the instructor.

ANTHROP 4G03** INDEPENDENT RESEARCH
Independent study of a research problem through published materials and/or field work. Students will be required to write up the results of their inquiry in scholarly form.
Prerequisite: Registration in Level IV of any Honours Anthropology programme, and written permission of the supervising professor.
This course may be repeated, if on a different topic, to a total of six units.

ANTHROP 4I03 CONTEMPORARY ANTHROPOLOGICAL THEORY
Seminar on selected recent developments in anthropological theory.
3 hrs.(seminar); one term
Prerequisite: Registration in Level IV of any Honours Anthropology programme.
This course is required of all students registered in Honours Anthropology.

ANTHROP 4K03 ADVANCED TOPICS IN LINGUISTICS
An advanced course covering many areas of linguistic theory through the intensive examination of a language or a set of languages.
3 hrs.(lects.); one term
Prerequisite: Twelve units of Linguistics above Level I; or permission of the instructor.
Same as Linguistics 4K03.

ANTHROP 4M03 ADVANCED REGIONAL ARCHAEOLOGY II
A study of the field data methods and theoretical problems in the prehistory of selected areas.
3 hrs.(seminar); one term
Prerequisite: Three units of Level III Archaeology courses.

ANTHROP 4N03 ANTHROPOLOGY AND EDUCATION
A comparison of the formal and informal ways in which people learn within their cultural context, and a survey of the uses of anthropology in schools.
3 hrs.(seminar); one term
Prerequisite: Registration in an Honours programme in Social Science; or permission of the instructor.

ANTHROP 4O03 HUMAN GENETICS
Consideration of some of the major areas in human genetics, including cytogenetics, bio-chemical, behavioural, and population genetics.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 2D03, or Biology 2C03; or permission of the instructor.

ANTHROP 4P03 PRIMATE BEHAVIOUR
Ecology, demography, social organization, and development of social behaviour among Old and New World monkeys and apes.
3 hrs.(lects. and discussion); one term
Prerequisite: One of Anthropology 2E03, 2F03, 2K03; or permission of the instructor.

ANTHROP 4Q03 ADVANCED SKELETAL BIOLOGY
Deals with topics in the analysis of prehistoric skeletal populations in more detail, including paleopathology, paleodemography, paleonutrition and the microscopic study of ancient human bone.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 3O06; or permission of the instructor.

ANTHROP 4Y03 DEVELOPING SOCIETIES
Topics may include for example, the meaning of development, innovation and technological change, urbanization, and protest movements.
3 hrs.(lects. and discussion); one term
Prerequisite: Anthropology 3S06; or permission of the instructor.

For **Graduate Courses**, see *Calendar of the School of Graduate Studies.*

Art and Art History

Faculty as of January 15, 1989

Glenn T. Scott/*Chairman*

Professor Emeritus

George B. Wallace/M.A. (*Trinity College, Dublin*)

Professor

Paul H. Walton/B.A. *(Toronto)*, A.M., Ph.D. *(Harvard)*

Associate Professors

Donald F. Carr/B.A. *(Guelph)*, M.F.A. *(Chicago)*
Hugh G. Galloway/Dipl. Art *(Edinburgh)*
Hayden B.J. Maginnis/B.A. *(Western)*, M.F.A., Ph.D. *(Princeton)*

Assistant Professors

Judy N. Major-Girardin/B.F.A. *(Windsor)*, M.F.A. *(Alabama)*
Bryan D. Mangrum/B.A. *(Swarthmore)*, M.F.A. *(Princeton)*
Glenn T. Scott/B.A. *(McGill)*, M.F.A., Ph.D. *(Princeton)*
Warren D. Tresidder/B.A. *(New South Wales)*, M.A. *(British Columbia)*, Ph.D. *(Michigan)*
Graham Todd/L.D.A.D. Dip. (*Chelsea School of Art*) M.F.A. (*Guanajuato*)/(part-time)

Art Gallery Curator

Kim G. Ness/B.A. *(McMaster)*, M. Litt. *(Edinburgh)*, M.M.St. *(Toronto)*

Associate Members

Katherine M.D. Dunbabin/Classics/B.A., D.Phil. *(Oxford)*
Alexander G. McKay/Classics/B.A. *(Toronto)*, M.A. *(Yale)*, A.M., Ph.D. *(Princeton)*, F.R.S.C.
Margaret C. Miller/Classics/B.A. (*British Columbia*), B.A. (*Oxford*), A.M., Ph.D. (*Harvard*)
Graham Petrie/English/M.A. (*St. Andrews*), B. Litt. (*Oxford*)

Department Note:

Art courses are open **only** to students registered in a programme in Honours Art.

ART

ART 1F06 INTRODUCTION TO STUDIO PRACTICE
An exploration of composition by two- and three-dimensional methods.
2 studio practice (3 hrs. each); two terms
Prerequisite: Submission of an acceptable portfolio, and an interview with the Department. *Portfolio*: The portfolio should contain a variety of original works in different media including works derived from both first hand observation and the imagination. During the interview students *may* be asked to do some drawing as an additional means of demonstrating their skills and interests.
Students are advised to submit their portfolios by the end of April.
Enrolment is limited.

ART 2A04 PAINTING I
An introduction to concepts, techniques and ideas related to the development of paintings from motif through organization to completed work.
1 studio practice (4 hrs.); two terms
Prerequisite: Art 1F06.
Enrolment is limited.

ART 2B04 SCULPTURE I
An introduction to concepts, techniques and ideas related to the development of sculpture from initial maquettes, through organization to completed work.
1 studio practice (4 hrs.); two terms
Prerequisite: Art 1F06.
Enrolment is limited.

ART 2C03 FIGURE DRAWING AND SUPERFICIAL ANATOMY
1 studio practice (3 hrs.); two terms
Prerequisite: Art 1F06.
Enrolment is limited.

ART 2F04 INTRODUCTORY PRINTMAKING
An introduction to methods of intaglio and relief printmaking, lithography and serigraphy.
1 studio practice (4 hrs.); two terms
Prerequisite: Art 1F06.
Enrolment is limited.

ART 2G03 STUDIO METHODS IN THE VISUAL ARTS
A studio course which will deal with a specific topic related to drawing, painting, printmaking, or sculpture, offering an examination of a specialized area.
1 studio practice (3 hrs.); two terms
Prerequisite: Registration in a programme in Art or Art History; or permission of the Department. Available as an elective only for students in a programme in Art or Art History.
Enrolment is limited.

ART 3A03 ADVANCED PAINTING I
A continuation of subjects explored in Art 2A04 with encouragement towards independent development.
2 studio practice (3 hrs. each); one term
Prerequisite: Art 2A04. Not open to students with credit in Art 3A06.
Enrolment is limited.

ART 3AA3 ADVANCED PAINTING II
A continuation of Art 3A03 with greater emphasis on the establishment of independent ideas.
2 studio practice (3 hrs. each); one term
Prerequisite: Art 3A03. Not open to students with credit in Art 3A06.
Enrolment is limited.

ART 3B03 ADVANCED SCULPTURE I
A continuation of subjects explored in Art 2B04 with encouragement towards independent development.
2 studio practice (3 hrs. each); one term
Prerequisite: Art 2B04. Not open to students with credit in Art 3B06.
Enrolment is limited.

ART 3BB3 ADVANCED SCULPTURE II
A continuation of Art 3B03 with greater emphasis on the establishment of independent ideas.
2 studio practice (3 hrs. each); one term
Prerequisite: Art 3B03. Not open to students with credit in Art 3B06.
Enrolment is limited.

ART 3C03 ADVANCED DRAWING
1 studio practice (3 hrs.); two terms
Prerequisite: Art 2C03.
Enrolment is limited.

ART 3D03 IMAGERY AND VISUAL COMMUNICATION
A course to develop the student's ability to make images that communicate definite messages and meanings for purposes other than self-expression.
1 studio practice (3 hrs.); two terms
Prerequisite: Art 2C03, and 2A04 or 2F04.
Enrolment is limited.

ART 3G06 CURRENT PRACTICES IN THE VISUAL ARTS
A series of seminars and/or workshops conducted by contemporary visual artists and individuals involved in the business of Art. A written thesis and a portfolio are requirements of the course.
3 hrs.; two terms
Prerequisite: Registration in Level III of a programme in Honours Art.
Enrolment is limited.

ART 3P06 ADVANCED PRINTMAKING
A continuation of Art 2F04 emphasizing more in-depth investigation of printmaking techniques.
2 studio practice (3 hrs. each); two terms
Prerequisite: Art 2F04. Not open to students with credit in Art 3E06 or 4A06.
Enrolment is limited.

ART 4B12 MAJOR STUDIO PROJECT
A summation of investigations into painting, sculpture, printmaking or drawing to be conducted under the supervision of two studio faculty members.
Prerequisite: Registration in Level IV of a programme in Honours Art with a grade of at least B− in 6 units of Level III work in the chosen field. Not open to students with credit in or registration in Art 4C06. Students wishing to integrate Art 4B12 with Art 4D03 must have a grade of at least A− in a previous course in the chosen field or fields.
Enrolment is limited.

ART 4C06 MINOR STUDIO PROJECT
An investigation into painting, sculpture, printmaking or drawing to be conducted under the supervision of a studio faculty member.
Prerequisite: Registration in Level IV of a programme in Honours Art with a grade of at least B− in 6 units of Level III work in the chosen field. Not open to students with credit in Art 3F06 or 4B12 or registration in 4B12. Students wishing to integrate Art 4C06 with Art 4D03 must have a grade of at least A− in a previous course in the chosen field or fields.
Enrolment is limited.

ART 4D03 MEDIA RESEARCH
Investigation of studio techniques, under the supervision of a studio faculty member.
Prerequisite: Registration in Level IV of a programme in Honours Art with a grade of at least B− in 6 units of Level III work in the chosen field. Students wishing to integrate Art 4B12 or 4C06 with Art 4D03 must have a grade of at least A− in a previous course in the chosen field or fields.
Enrolment is limited.

ART HISTORY

ART HIST 1A06 INTRODUCTION TO THE STUDY AND HISTORY OF THE VISUAL ARTS

An examination of the various forms and functions of art and architecture in the Western tradition, with an historical study of the major monuments of that tradition.

3 lects.; two terms

Prerequisite: Open.

ART HIST 2B03 GREEK ART

The architecture, sculpture, and painting of the Greek and Hellenistic worlds.

3 lects.; one term

Prerequisite: Open to students in Level II and above.

Same as Classical Civilization 2B03.

ART HIST 2C03 ROMAN ART

The architecture, sculpture, and painting of the Roman world.

3 lects.; one term

Prerequisite: Open to students in Level II and above.

Same as Classical Civilization 2C03.

ART HIST 2G03 THE ART OF THE MEDIEVAL WORLD

A systematic survey of the history of medieval art between c. 350 and 1400 A.D.

3 lects.; one term

Prerequisite: Open to students in Level II and above.

ART HIST 2H03 AESTHETICS

An introduction to some main theories of the nature of art, criticism, and the place of art in life and society.

3 lects.; one term

Prerequisite: One previous course in Philosophy; or permission of the Department of Philosophy.

Same as Philosophy 2H03.

ART HIST 2M03 THE ART AND ARCHITECTURE OF THE ITALIAN RENAISSANCE 1400-1580

3 lects.; one term

Prerequisite: Open to students in Level II and above.

ART HIST 2N03 ITALIAN BAROQUE ART AND ARCHITECTURE

An examination of the major trends in Italian art and architecture from 1580-1780.

3 lects.; one term

Prerequisite: Open to students in Level II and above.

ART HIST 2O03 THE ORIGINS OF MODERN ART 1780-1880

A study of the origin and development of modern styles from Neo-Classicism through Impressionism.

3 lects.; one term

Prerequisite: Open to students in Level II and above.

ART HIST 2P03 MASTERS OF TWENTIETH-CENTURY ART AND ARCHITECTURE

Topics examined will include Post-Impressionism, Fauvism, Cubism, Surrealism, and related developments.

3 lects.; one term

Prerequisite: Open to students in Level II and above.

ART HIST 2R03 THE ART OF THE NORTHERN RENAISSANCE 1400-1580

An examination of the art of the Netherlands, Germany and Austria in the fifteenth and sixteenth centuries.

3 lects.; one term

Prerequisite: Open to students in Level II and above.

ART HIST 2X06 THE ART OF THE FILM

An introduction to film style and technique through a detailed critical analysis of major works from the silent period to the present day.

2 lects. plus one weekly film screening; two terms

Prerequisite: 6 units of Humanities, preferably Drama 1A06; or permission of the instructor or the Drama Chairman.

Same as Drama 2X06.

Enrolment is limited.

ART HIST 3AA3 CONTEMPORARY ART

An examination of major developments in painting, sculpture, and other media from World War II to the present together with a review of related critical theory.

3 lects.; one term

Prerequisite: Art History 2P03 or permission of the instructor. Not available to students with credit in Art History 3R03.

Offered in alternate years.

ART HIST 3B03 ASPECTS OF CANADIAN ART

A survey of the visual arts in Canada from the earliest explorations and settlements to the present.

3 lects.; one term

Prerequisite: Open to students in Level II and above.

Offered in alternate years.

ART HIST 3BB3 THE ART OF NORTHERN EUROPE IN THE SEVENTEENTH CENTURY

A discussion of the art of France, Flanders, the Netherlands and England in the Baroque period. Emphasis will be given to Rubens, Poussin and Rembrandt.

3 lects.; one term

Prerequisite: Art History 2N03 or permission of the instructor. Not available to students with credit in Art History 4N03.

Offered in alternate years.

ART HIST 3C03 THE ICONOGRAPHY OF CHRISTIAN ART

An introduction to Christian iconography through the study of representations of the life of Christ from early Christian times to the present.

3 lects.; one term

Prerequisite: Registration in a programme in Art or Art History; or permission of the instructor. Not available to students with credit in Art History 2Q03.

Offered in alternate years.

ART HIST 3F03 THE AMERICAN CINEMA I

A survey of some of the predominant features of the American Cinema from its beginning to 1940. Emphasis will be placed both on the artistic value of the films and on their social significance and impact.

2 lects. plus one weekly film screening; one term

Prerequisite: Art History 2X06; or permission of the instructor or the Drama Chairman. Not available to students with credit in Drama 3R06.

Same as Drama 3R03.

ART HIST 3FF3 THE AMERICAN CINEMA II

A survey of some of the predominant features of the American Cinema from 1940 to the present day. Emphasis will be placed both on the artistic value of the films and on their social significance and impact.

2 lects. plus one weekly film screening; one term

Prerequisite: Art History 2X06; or permission of the instructor or the Drama Chairman. Not available to students with credit in Drama 3R06.

Same as Drama 3RR3.

ART HIST 3G03 LATE ANTIQUE AND EARLY CHRISTIAN ART

The art and architecture of the later Roman Empire, and the birth of Christian Art (A.D. 200-600).

3 lects.; one term

Prerequisite: Art History 2C03 or 2G03; or permission of the Department.

Same as Classical Civilization 3G03.

Alternates with Art History 3H03.

ART HIST 3H03 ARCHAIC GREEK ART

The formative period of Greek Art from its rebirth after the Dark Ages to the Persian Wars (ca. 1000-480 B.C.) and its relationship to the art of the Near East.

3 lects.; one term

Prerequisite: Art History 2B03 or Classical Civilization 2B03; or permission of the Department.

Offered in 1989-90.Alternates with Art History 3G03.

Same as Classical Civilization 3H03.

ART HIST 3L03 VENETIAN RENAISSANCE PAINTING

An examination of the works of the major painters of the Renaissance in Venice, including such artists as Giovanni Bellini, Giorgione and Titian.

3 lects.; one term

Prerequisite: Art History 2M03.

Offered in alternate years.

ART HIST 3M03 MODERN ARCHITECTURE

An examination of the new problems facing the architect in the 19th century, and the Modern Movement in Europe and America in the 20th century.

3 lects.; one term

Prerequisite: Open to students in Level II and above.

Offered in alternate years.

ART HIST 3Q03 THE HISTORY OF PRINTMAKING

A survey of the history of printmaking from the fifteenth century to the present.

3 lects.; one term

Prerequisite: Open to students in Level II and above.

Offered in alternate years.

ART HIST 3S03 ART AND CIVILIZATION AT THE DAWN OF THE ITALIAN RENAISSANCE 1200-1400

A study of Italian art and civilization in the age of transition between the Middle Ages and the Renaissance.

3 lects.; one term

Prerequisite: Registration in Levels III or IV of a programme in Art or Art History; or permission of the instructor.

Offered in alternate years.

ART HIST 3V03 SUPERVISED READING

Readings in a field of special interest to the student, under the guidance of a Faculty member.

Prerequisite: Registration in Level III or IV of Honours Art History or Level IV Honours Art and a grade of at least B− in a previous course in the chosen field; or permission of the Department. Not open to students taking Art 4D03.

ART HIST 3W03 THE ART OF PHOTOGRAPHY

An historical and critical discussion of photography and its contribution to modern visual culture.

3 lects.; one term

Prerequisite: Registration in Level III or IV of any programme.

Offered in alternate years.

ART HIST 3X03 TOPICS IN ANCIENT ART AND ARCHAEOLOGY
1989-90: Hellenistic and Roman Painting
A study of painting in the later Greek world (from ca. 350 B.C.) and subsequent developments in Italy and the Roman Empire. The evidence will be drawn principally from wall-paintings.
Seminar (2 hrs.); one term
Prerequisite: Art History 2B03 or 2C03, and registration in Level III or IV of a programme in Art History or Classical Studies; or permission of the Department of Classics.
Offered in alternate years.
Same as Classical Civilization 3X03.
Art History 3X03 may be repeated, if on a different topic, to a total of six units.

ART HIST 3Y03 FRENCH CINEMA
A survey of French Cinema from its beginnings to the present through detailed critical analysis of major works.
2 lects. plus one weekly film screening; one term
Prerequisite: Art History 2X06, or French 1A06 or 1B06; or permission of the instructor or the Drama Chairman.
Same as Drama 3Y03 and French 3Y03.

ART HIST 4AA3 SPECIAL STUDIES IN CONTEMPORARY ART
An in-depth examination of one or more significant movements in contemporary Art from 1960 to the present. Topics will vary from year to year but will be drawn from a list including Pop-Art, Post-Painterly Abstraction, Minimal Art, Conceptual Art, Earthworks, Super-Realism and Neo-Expressionism.
Seminar (2 hrs.); one term
Prerequisite: Art History 3AA3 or permission of the instructor.
Offered in alternate years.
Enrolment is limited.

ART HIST 4C03 THE ART OF THE HIGH RENAISSANCE IN ROME
A study of the art and architecture of Raphael, Michelangelo and their contemporaries in Rome in the early 16th century.
Seminar (2 hrs.); one term
Prerequisite: Art History 2M03, and permission of the instructor.
Offered in alternate years.
Enrolment is limited.

ART HIST 4F03 DUTCH PAINTING OF THE SEVENTEENTH CENTURY
A study of the so-called "minor masters" of Holland's Golden Age of painting.
Seminar (2 hrs.); one term
Prerequisite: Art History 3BB3; or permission of the instructor.
Offered in alternate years.
Enrolment is limited.

ART HIST 4HH3 LITERATURE AND FILM
An examination of the particular characteristics of both literature and film and the inter-relationship between them through a detailed study of selected novels, short stories and plays and the films that have been based on them.
3 lects. plus one weekly film screening; one term
Prerequisite: Registration in Level III or IV of a programme in Drama, Literature or Art History; or permission of the instructor or the Drama Chairman. It is recommended that students should already have taken Art History 2X06.
Same as Comparative Literature 4H03, Drama 4H03 and English 4H03.

ART HIST 4KK3 FILM COMEDY
A study of the tradition of film comedy within a framework of comic theory in general and especially in its application to drama.
2 lects. plus one weekly film screening; one term
Prerequisite: Art History 2X06; or permission of the instructor or the Drama Chairman. Not available to students with credit for this topic taken under Drama 4D03.
Same as Drama 4K03.

ART HIST 4M03 ASPECTS OF THE ART OF MATISSE AND PICASSO
An examination of selected paintings, sculptures and drawings by Henri Matisse and Pablo Picasso.
3 lects.; one term
Prerequisite: Art History 2P03.
Offered in alternate years.

ART HIST 4O06 THESIS
Supervised study of a problem in the history of art of special interest to the student.
Prerequisite: Registration in Level IV of Honours Art History, and a grade of at least B– in a previous course in the chosen field, and permission of the Department.

ART HIST 4Q03 CARAVAGGIO
A study of all of the paintings attributed to Caravaggio and their stylistic and documentary evidence. The variety of methods of examining an artist's work is emphasized.
3 lects.; one term
Prerequisite: Art History 2N03. Not available to students with credit in Art History 3E03.
Offered in alternate years.

ART HIST 4R03 PAINTING AND SCULPTURE OF FIFTEENTH-CENTURY ITALY
An examination of the representational arts of the early Renaissance with emphasis on the Florentine contribution.
3 lects.; one term
Prerequisite: Art History 2M03.
Offered in alternate years.

ART HIST 4V03 THE STUDY, CRITICISM AND EVALUATION OF ART
A seminar to introduce students to the history, theory, and practice of connoisseurship. Its focus will be to develop skills in confronting the single work of art.
Seminar (2 hrs.); one term
Prerequisite: Registration in Level III or IV of a programme in Art or Art History; or permission of the instructor.
Offered in alternate years.
Enrolment is limited.

ART HIST 4W03 MODERN LANDSCAPE ART
A discussion of the origins, development and significance of landscape art from the late eighteenth century to the present. The main emphasis will be on painting in England and France.
Seminar (2 hrs.); one term
Prerequisite: Registration in Level III or IV of a programme in Art or Art History; or permission of the instructor.
Offered in alternate years.
Enrolment is limited.

ART HIST 4X03 INTRODUCTION TO ART GALLERIES AND MUSEUMS
A study of the history and methods of institutions created for the purpose of collecting, preserving, displaying and interpreting art objects.
Seminar (2 hrs.); one term
Prerequisite: Registration in Level III or IV of a programme in Art or Art History, and permission of the Department.
Offered in alternate years.
Enrolment is limited.

Arts and Science

Council of Instructors

Herbert M. Jenkins (Psychology)/*Director*

Sylvia Bowerbank (English)
David W. Butterfield (Economics)
Barbara M. Ferrier (Biochemistry)
David A. Goodings (Physics)
Louis Greenspan (Religious Studies)
Robert C. Hudspith (Mechanical Engineering)
Stephen C. Lonergan (Geography)
Alan Mendelson (Religious Studies)
James D. Stewart (Mathematics and Statistics)
Mark Vorobej (Philosophy)

Department Notes:

1. **Prerequisites:** The prerequisite for all Level I, II, III and IV courses is registration in the Arts and Science Programme.
2. **Limited Enrolment:** Enrolment in Level I of the Arts and Science Programme is limited to approximately 50 students. Enrolment in Arts and Science courses is also limited to approximately 50 students.
3. All courses are 3 hrs. (lects., discussion groups, seminars), except Arts and Science 2D06 which includes occasional labs. All courses are two terms.

ARTS & SCI 1A06 WESTERN THOUGHT I
An examination of central themes, from the time of the Greeks to the present, in Western religious, philosophical, and scientific thought. Students will study the formulation of these themes in such thinkers as Plato, Nietzsche, Rousseau, Augustine, and Descartes. Topics considered will include the legitimacy of the state; the scope and limits of reasoning; and the foundations of morality. Though the problems discussed will be formulated in a contemporary idiom the works will be viewed with respect to their historical context.

ARTS & SCI 1B06 WRITING AND INFORMAL LOGIC
The primary aim of this course is to develop the student's critical and analytical skills in dealing with the written word. Students will examine the structure of selected texts, analyze various types of reasoning, and receive individual attention in expository writing.

ARTS & SCI 1C06 INQUIRY
Inquiry seminars are designed to develop skills basic to the systematic investigation of public issues. These skills include those involved in formulating questions, gathering and interpreting evidence from a variety of sources, evaluating arguments, and reaching well-considered conclusions. This course includes lectures and exercises on advanced methods of library research and an introduction to computers.

ARTS & SCI 1D06 CALCULUS
This course aims to provide a thorough understanding of the principles and major applications of differential and integral calculus of functions of one variable, as well as an introduction to multivariate calculus and differential equations.
Arts and Science 1D06 serves as a prerequisite for all upper level Mathematics, Statistics, Computer Science and Physics courses, for which Mathematics 1A06 is a prerequisite.

ARTS & SCI 2A06 WESTERN THOUGHT II
Development of political, economic, sociological and psychological thought in the writings of such major figures as Hobbes, Rousseau, Adam Smith, Marx, Weber, Keynes, Freud and Skinner. Attention will be given to their treatment of such topics as the nature of man, the concept of human rights, the role of government in the economy, the motivation of human action, and the applicability of scientific method to political, economic and psychological problems.

ARTS & SCI 2D06 PHYSICS
Classical mechanics and special relativity highlighting the discoveries of Newton and Einstein. The chemical evidence for atoms; chemical reactions, valence and the periodic table. Elementary thermal physics and the laws of thermodynamics. Survey of the important discoveries leading to the quantum theory. Introduction to atomic and molecular structure. Laboratory projects will be undertaken.

ARTS & SCI 2R06 MATHEMATICAL MODELS FOR CHANGE, CHANCE AND ERROR
Probability, distributions, measures of association, tests of significance, mathematical models, and other quantitative methods useful in the analysis of variable phenomena.

ARTS & SCI 3A06 LITERATURE
Literary works drawn from a variety of genres and periods will be examined. The course will focus on the ways in which great writers have treated enduring human ethical concerns. It will attempt to show how literary creativity involves the matching of formal and stylistic mastery, on the one hand, with ethical awareness on the other. The course will require frequent brief written assignments.
Same as Comparative Literature 3A06.

ARTS & SCI 3B06 TECHNOLOGY AND SOCIETY
The roll of technology in culture will be examined. Consideration will be given to models of the technology-society relationship and to problems encountered in the attempt to control technoloy.

ARTS & SCI 3C06 INQUIRY
The upper-level inquiry seminars build on the skills acquired in Arts and Science 1C06 and examine a variety of important public issues. Some are more concerned with scientific, technological, or empirical matters; others emphasize cultural and personal values.

Topics in 1989-90: To Be Announced
Arts and Science 3C06 may be repeated, if on a different topic, to a total of 12 units. Permission of the Director is required to take more than 12 units of inquiry seminars beyond Level I.

ARTS & SCI 3D06 CREATIVE ARTS
The nature of the graphic arts and music, and their relation to culture and ideas, is examined. Close attention is paid to the creative process as a way of understanding the nature of the artistic product.

ARTS & SCI 4A06 INDIVIDUAL STUDY
This course consists of a library, laboratory, or field project under the supervision of a faculty member. Students intending to register must first consult the Director of the Arts & Science Programme and then prepare an outline for approval after consultation with the faculty supervisor.

ARTS & SCI 4A12 INDIVIDUAL STUDY
Same as Arts and Science 4A06.

ARTS & SCI 4C06 THESIS
This course consists of a library, laboratory, or field project under the supervision of a faculty member. Three copies of a completed thesis must be submitted by the end of classes. Students intending to register must first consult the Director of the Arts & Science Programme and then prepare an outline for approval after consultation with the faculty supervisor.

ARTS & SCI 4C12 THESIS
Same as Arts and Science 4C06.

Asian Studies

While there is no B.A. programme in *Asian Studies*, students interested in concentrating in this area may choose from among the following courses offered by various departments. Those desiring further information on specific courses should consult the departmental listing in the Calendar.

Students wishing to pursue *Asian Studies* may obtain further information from Dr. D. Barrett (History) or Dr. K. Shinohara (Religious Studies).

COURSES DEALING STRICTLY WITH ASIAN MATERIAL

Anthropology 3H03	Ethnology: Southeast Asia
Anthropology 3X03	People of India
Geography 2C03	China: People and Land in Transition
History 2B06	China: From the Opium War to the Present
History 3B03	Modern Japan
History 3DD3	Imperial China
History 4G06	The Revolutionary Movement in Modern China
Political Science 2M06	Introduction to Far Eastern Political Traditions
Political Science 3D03	Comparative Politics: Southeast Asian Systems
Political Science 3MM6	The Politics of Modern and Contemporary China
Political Science 3Q06	Politics in Japan
Political Science 3V03	Culture and Politics in South Asia
Religious Studies 2J06	India: Its Culture, Social History, Religion and Philosophy
Religious Studies 2MM6	East Asian Religions
Religious Studies 2T03	Yoga: Theory and Practice
Religious Studies 3AA3	Popular Religion in India
Religious Studies 3C03	Divination and Philosophy of *I-Ching* or the *Book of Changes*
Religious Studies 3N03	The Individual and Society in Japanese Tradition
Religious Studies 3Q06	The Buddhist Tradition
Religious Studies 4AA6	Advanced Study in Hindu Religious History
Religious Studies 4BB6	Advanced Study in Buddhist and East Asian Religious History
Religious Studies 4E06	Advanced Study in Indian Philosophy

COURSES WITH A SIGNIFICANT AMOUNT OF ASIAN CONTENT

Economics 3J06	Economic Development
Political Science 3VV3	Culture and Politics in the Middle East and Africa
Religious Studies 1B06	World Religions
Religious Studies 1F06	War and the Problem of Meaning
Religious Studies 1H03	Religious Revitalization and Dissent
Religious Studies 2AA3	Mysticism in Hindu and Christian Traditions
Religious Studies 2BB3	Images of the Divine Feminine
Religious Studies 2CC3	Specialists in the Sacred
Religious Studies 2H03	Issues in War and Peace
Religious Studies 2QQ3	Cults in North America
Religious Studies 2SS3	Women and Religion
Religious Studies 2WW3	Health, Healing and Religion
Religious Studies 2XX6	Religious Foundations of Political Order, East and West

LANGUAGE COURSES

Chinese 1Z06	Beginner's Intensive Chinese
Japanese 1Z06	Beginner's Intensive Japanese
Japanese 2Z06	Intermediate Japanese
Sanskrit 3A06	Introduction to Sanskrit Grammar
Sanskrit 4B06	Readings in Sanskrit Texts

Biochemistry

Faculty as of January 15, 1989

H.P. Ghosh/*Chairman*

Profesor Emeritus

Ross H. Hall/B.A. *(British Columbia)*, M.A. *(Toronto)*, Ph.D. *(Cambridge)*

Professors

Vettai S. Ananthanarayanan/M.Sc., Ph.D. *(Madras)*
Russell A. Bell/M.Sc. (*Wellington*), M.S. (*Wisconsin*), Ph.D. (*Stanford*), F.C.I.C., Professor of Chemistry
Luis A. Branda/B.Sc., D.Sc. (*Uruguay*)
William W. Chan/M.A., Ph.D. (*Cambridge*)
Richard M. Epand/A.B. (*Johns Hopkins*), Ph.D. (*Columbia*)
Barbara M. Ferrier/B.Sc., Ph.D. (*Edinburgh*)/part-time
Karl B. Freeman/B.A., Ph.D. (*Toronto*)
Hara P. Ghosh/M.Sc., D.Phil. (*Calcutta*)
Radhey S. Gupta/M.Sc. (New Delhi), Ph.D. (*Bombay*)
Richard J. Haslam/M.A., D.Phil. *(Oxford)*, Professor of Pathology
John H. Hassell/B.Sc. *(Brooklyn College)*, Ph.D. *(Connecticut)*
Dennis R. McCalla/B.Sc. (*Alberta*), M.Sc. (*Saskatchewan*), Ph.D. (*California Inst. of Technology*), F.C.I.C.
Evert Nieboer/M.Sc. (*McMaster*), Ph.D. (*Waterloo*)

BIOCHEMISTRY

Associate Professor

Gerhard E. Gerber/B.Sc., Ph.D. *(Toronto)*

Assistant Professors

David W. Andrews/B.Sc. *(Ottawa)*, Ph.D. *(Toronto)*
Douglas W. Bryant/B.Sc. *(McGill)*, M.Sc., Ph.D. *(York)*/part-time
John P. Capone/B.Sc. *(Western)*, Ph.D. *(McMaster)*
Calvin B. Harley/B.Sc. *(Waterloo)*, Ph.D. *(McMaster)*
Richard A. Rachubinski/B.Sc., M.Sc., Ph.D. *(McGill)*
Daniel S.-C. Yang/B.Sc., M.Sc. *(Alberta)*, Ph.D. *(Pittsburgh)*

Associate Members

Stephanie A. Atkinson/(Pediatrics) B.A. *(Western)*, Ph.D. *(Toronto)*
Stanley T. Bayley/(Biology) B.Sc., Ph.D. *(London)*

BIOCHEM 2A03 PRINCIPLES OF BIOCHEMISTRY I
An overview of biochemical processes emphasizing the importance of structure, reactivity and energetics of molecules in biological systems. Designed for students intending to proceed to Biochemistry 3A06.
3 lects.; one term
Prerequisite: Credit or registration in one of Chemistry 2B06, 2O06, and registration in a programme in which Biochemistry 2A03 is required. Not open to students who have credit or are registered in Biochemistry 2E03 or 3G06.

BIOCHEM 2E03 ELEMENTARY BIOCHEMISTRY
A treatment of the basic areas of biochemistry, including physiological chemistry. Designed for students who do not intend to pursue biochemistry.
3 lects.; one term
Prerequisite: Credit or registration in one of Chemistry 2D03, 2B06, 2O06. Not open to students who are registered in or have completed Biochemistry 2A03, 3A06, 3B03, 3C03 or 3G06.

BIOCHEM 3A06 PRINCIPLES OF BIOCHEMISTRY II
Major themes of biochemistry based on current concepts and methodology. An extension of the principles covered in Biochemistry 2A03.
3 lects; one term
Prerequisite: Biochemistry 2A03. Not open to students who have completed Biochemistry 3B03, 3C03 or 3G06.

BIOCHEM 3G06 COMPREHENSIVE BIOCHEMISTRY
Major concepts of biochemistry, and modern methods used in biochemical investigations, nature of cellular processes, structure and function of macromolecules, metabolism and its regulation.
3 lects.; two terms
Prerequisite: Chemistry 2B06 or 2O06. Not open to students who have completed Biochemistry 2A03, 3A06, 3B03, or 3C03.

BIOCHEM 3H03 CLINICAL BIOCHEMISTRY
An outline of clinical chemistry; its relation to disease and relevance to health care.
3 lects.; one term
Prerequisite: Credit or registration in Biochemistry 3A06, 3B03 or 3G06.

BIOCHEM 3L06 BIOCHEMISTRY LABORATORY
Illustration of fundamental principles of Biochemistry.
2 labs.(3); two terms
Prerequisite: Biochemistry 2A03 and registration in a programme in which Biochemistry 3L06 is required.

BIOCHEM 3L03 BIOCHEMISTRY LABORATORY
Identical to first part of Biochemistry 3L06.
1 lab.(3); one term
Prerequisite: Biochemistry 2A03 and registration in a programme in which Biochemistry 3L03 is required.

BIOCHEM 3N03 NUTRITION AND METABOLISM
Relation of diet to metabolism and regulation of metabolism including: nutrition and the immune system; vitamin deficiency and membrane function; physical activity, energy and obesity; drug and nutrient interactions; health implications.
3 lects.; one term
Prerequisite: Credit or registration in Biochemistry 3A06 or 3C03, or credit in Biochemistry 3G06. Not open to students with credit in Biochemistry 4N03.

BIOCHEM 4A03 RECENT ADVANCES IN BIOCHEMISTRY
Student presentation and critical evaluation of selected topics from the current research literature in Biochemistry and Molecular Biology.
Seminar (3 hrs.); one term
Prerequisite: Registration in Level IV of an Honours Programmme in Biochemistry. Permission of the Department must be sought during registration in March. Admission will be decided by June 1.
Enrolment is limited.

BIOCHEM 4B06 SENIOR THESIS
A thesis based on a project directly supervised by a member or associate member of the Department of Biochemistry.
3 labs.(3); two terms
Prerequisite: Students registered in Level IV Biochemistry or Molecular Biology and Biotechnology programmes who have a CAA of at least 10.0 are eligible. Potential registrants should consult the Chairman before June 1st.
Enrolment is limited.

BIOCHEM 4D03 BIOTECHNOLOGY AND GENETIC ENGINEERING
Theory, methods and applications in genetic engineering and biotechnology with emphasis on recombinant DNA, hybridomas, engineered organisms, and fermentation processes.
3 lects.; one term
Prerequisite: One of Biochemistry 3A06, 3C03, 3G06.
Same as Molecular Biology 4B03.

BIOCHEM 4E03 GENE EXPRESSION
An advanced course covering molecular aspects of gene expression in eukaryotes: DNA replication, control of transcription, RNA processing and transport, translation, protein processing and targeting.
3 lects.; one term
Prerequisite: One of Biochemistry 3A06, 3C03, 3G06.
Same as Molecular Biology 4C03 and Biology 4N03.

BIOCHEM 4F03 MOLECULAR ASPECTS OF EUKARYOTIC CHROMOSOMES
Chromatin structure, repeated DNA sequences, concerted evolution of gene families, telomeres, centromeres, gene transfer, oncogenes, transposable elements.
3 lects.; one term
Prerequisite: Biology 3O03 and one of Biochemistry 3A06, 3C03, 3G06.
Same as Molecular Biology 4D03 and Biology 4M03.

BIOCHEM 4G03 BIOTECHNOLOGY AND GENETIC ENGINEERING LABORATORY
This lab is complementary to Biochemistry 4D03. Experiments may involve cloning, engineered mutagenesis, DNA sequencing, expression of cloned gene and fermentation.
2 labs. (4); one term
Prerequisite: One of Biochemistry 3A06, 3C03, 3G06 and one of Biochemistry 3L03 or 3L06. Permission of the Department is required before September 15.
Same as Molecular Biology 4A03.
Enrolment is limited.

BIOCHEM 4H03 REPLICATION AND RECOMBINATION
Replication, recombination, repair and mutagenesis of DNA.
3 lects,; one term
Prerequisite: Biology 3O03 and one of Biochemistry 3A06, 3C03, 3G06.
Same as Molecular Biology 4E03 and Biology 4MM3.

BIOCHEM 4I03 STRUCTURAL AND MECHANISTIC ASPECTS OF MACROMOLECULES
Advanced treatment of protein and nucleic acid structure. Mechanism of enzymes and cofactors including metal ions. Interaction involving macromolecules.
3 lects.; one term
Prerequisite: One of Biochemistry 3A06, 3C03, 3G06, and one of Chemistry 3D03, 3D06, 3F03; or permission of the instructor.

BIOCHEM 4L03 ADVANCED BIOCHEMISTRY LABORATORY
Fundamental principles of experimental biochemistry with emphasis on modern methods in enzymology, membrane biochemistry and molecular biology.
2 labs.(4); one term
Prerequisite: Biochemistry 3A06, 3C03, 3G06 and one of Biochemistry 3L03, 3L06. Not open to students who are registered in or have completed Biochemistry 4G03.

BIOCHEM 4M03 MEMBRANE STRUCTURE AND FUNCTION
Chemical structure and molecular organization of membrane constituents. Molecular basis of the biological activity of membranes.
3 lects.; one term
Prerequisite: One of Biochemistry 3A06, 3C03, 3G06.

BIOCHEM 4P03 RESEARCH PROJECT
A research project will be supervised by a member or associate member of the Department of Biochemistry.
3 labs.(3); one term
Prerequisite: One of Biochemistry 3A06, 3C03, 3G06 and registration in Level IV Biochemistry or Molecular Biology and Biotechnology. Permission of the Department required before September 15. Not open to students who have credit or are registered in Biochemistry 4B06 or 4U06.
Enrolment is limited.

BIOCHEM 4Q03 BIOCHEMICAL PHARMACOLOGY
Interactions of drugs with living systems. Drug absorption, distribution, mechanism of action, metabolism and elimination will be discussed.
3 lects.; one term
Prerequisite: One of Biochemistry 3A06, 3C03, 3G06. Not open to students who have credit or are registered in Biology 3AA3.

BIOCHEM 4U06 ADVANCED EXPERIMENTATION
Fundamental experimental principles of biochemistry and chemistry including modern instrumental methods. Three units selected from Chemistry 4T06 plus Biochemistry 4P03.
2 labs.(4); two terms
Prerequisite: Registration in Level IV Honours Biochemistry and Chemistry. Not open to students who have credit, or are registered in, one of Biochemistry 4L06, 4P03, Chemistry 4T04, 4T06.
Same as Chemistry 4U06.

For **Graduate Courses**, see *Calendar of School of Graduate Studies.*

Biology

Faculty as of January 15, 1989

S.F.H. Threlkeld/*Chairman*

Professors Emeriti

Douglas Davidson/B.Sc. (*Durham*), D.Phil. (*Oxford*)
Douglas M. Davies/B.A., Ph.D. (*Toronto*), F.E.S.C.
Kenneth A. Kershaw/B.Sc. (*Manchester*), Ph.D. (*N. Wales*), D.Sc. (*Wales*), F.R.S.C.
John J. Miller/B.A., Ph.D. (*Toronto*)

Professors

Stanley T. Bayley/B.Sc., Ph.D. (*London*)
Frank L. Graham/(*Pathology*) M.A., Ph.D. (*Toronto*)
John H. Hassell/B.Sc. (*Brooklyn College*), Ph.D. (*Connecticut*)
John N.A. Lott/ B.Sc. (*British Columbia*), M.S., Ph.D. (*California, Davis*)
Stanley Mak/M.Sc. (*Saskatchewan*), Ph.D. (*Toronto*)
Richard A. Morton/M.S., Ph.D. (*Chicago*)
B. Ann Oaks/B.A. (*Toronto*), M.A., Ph.D. (*Saskatchewan*), F.R.S.C.
Ludvik Prevec/M.A., Ph.D. (*Toronto*)
Andrew J. Rainbow/(*Radiology*) B.Sc. (*Manchester*), M.Sc. (*London*), Ph.D. (*McMaster*)
Rama S. Singh/B.Sc. (*Agra*), M.Sc. (*Kanpur*), Ph.D. (*California, Davis*)
George J. Sorger/B.Sc. (*McGill*), M.S., Ph.D. (*Yale*)
Iwao Takahashi/B.A. (*Hakodate*), M.S.A. (*Kyushu*), Ph.D. (*Montreal*)
Stephen F.H. Threlkeld/M.Sc. (*Alberta*), Ph.D. (*Cambridge*), P.Ag.
Richard A. Vollenweider/Dipl.Biol.Math., Ph.D.(*Science*) (*Zurich*)/part-time
Jean E.M. Westermann/B.Sc. (*Western*), M.A. (*Mount Holyoke*), Ph.D. (*Toronto*)
Christopher M. Wood/B.Sc., M.Sc. (*British Columbia*), Ph.D. (*East Anglia*)

Associate Professors

Thomas T. Chen/B.Sc. (*National Chung-Hsing University*), M.A. (*SUNY, Plattsburg*), Ph.D. (*Alberta*)
Allan D. Dingle/B.Sc. (*McMaster*), M.Sc. (*Illinois*), Ph.D. (*Brandeis*)
Doris E.N. Jensen/M.A. (*Toronto*), Ph.D. (*British Columbia*)
D. Gordon McDonald/B.A. (*Western*), M.A., Ph.D. (*Calgary*)
Colin A. Nurse/B.E.Sc. (*Western*), Ph.D. (*Harvard*)
Michael J. O'Donnell/B.Sc., Ph.D. (*Toronto*)
James S. Pringle/(*Royal Botanical Gardens*), A.B. (*Dartmouth*), M.S. (*New Hampshire*), Ph.D. (*Tennessee*)/Part-time
C. David Rollo/B.Sc., M.Sc. (*Guelph*), Ph.D. (*British Columbia*)

Assistant Professors

Turlough Finan/B.Sc., M.Sc. (*National, Ireland*), Ph.D. (*Guelph*)
Jurek Kolasa/M.Sc., Ph.D. (*Poznan*)
Raymond W.H. Lee/B.Sc., Ph.D. (*McGill*)

Instructional Assistants

Herbert Pohl/B.Sc., M.Sc. (*McMaster*)
Raymond Procwat/B.Sc. (*McMaster*), B.Ed. (*Toronto*)
Margaret A. Service/ B.Sc. (*Western*), M.Sc.T. (*McMaster*)

BIOLOGY 1A06 ADAPTATION IN THE BIOLOGICAL WORLD
A course in introductory Biology which stresses the adaptation of form and function at the levels of molecules, cells, organisms and populations.
2 lects., 1 tut. or 1 lab.(3); two terms
Prerequisite: Registration in, or completion of Natural Sciences I, or Arts and Science I; or completion of Engineering I. Chemistry 1A06 is strongly recommended; in addition, students intending to take Level II, III, IV Biology courses should note that Chemistry 1A06 is a prerequisite for many of the courses. Not open to students registered in the Faculties of Humanities and Social Sciences.

BIOLOGY 1G06 INTRODUCTION TO BIOLOGY
Basic concepts in cell biology, animal physiology and genetics. The course covers cell structure, organelle function, metabolism, growth, division, endocrinology, muscle function, circulation, excretion, and immunology.
3 lects., or 2 lects., 1 lab.(3); two terms
Prerequisite: At least a 60% average in two Grade 13 or OAC science or mathematics courses; or a grade of at least C− in Physical Education 2C06. Not open to students registered in the Faculty of Science.

BIOLOGY 1J03 HUMAN PHYSIOLOGY
Physiology of respiration, circulation, energy and muscle metabolism and reproduction.
3 lects. or 2 lects., 1 lab.(3); one term
Prerequisite: Registration in Physical Education I.

BIOLOGY 2B03 CELL BIOLOGY
The cell as the fundamental unit of life. The origin of life, evolution of prokaryote and eukaryote cells, development of multi-cellularity and cell specialization.
3 lects.; 2 lects., 1 lab.(3); or 2 lects., 1 tut.; one term
Prerequisite: Biology 1A06; or a grade of at least B− in Biology 1G06; and one of Chemistry 1A06, 1A07, 1B06, 1B07.

BIOLOGY 2C03 GENETICS
Structure, function and transmission of genes; chromosomal basis of inheritance; mono- and dihybrid crosses; sequential steps in gene function; linkage maps; sex chromosome inheritance.
3 lects., or 2 lects., 1 lab.(3); one term
Prerequisite: Biology 1A06, or a grade of at least B− in Biology 1G06, and completion of Chemistry 1A06, 1A07, 1B06, 1B07.

BIOLOGY 2D03 THE PLANT KINGDOM
An introduction to the major groups of green plants. Growth and development of vegetative parts and mechanisms of reproduction will be emphasized.
2 lects., 1 lab.(3); one term
Prerequisite: Completion of Biology 1A06; or a grade of at least B− in Biology 1G06.

BIOLOGY 2E03 THE ANIMAL KINGDOM
An introduction to the major animal groups, with emphasis on structure and function.
2 lects., 1 lab.(3); one term
Prerequisite: Completion of Biology 1A06; or a grade of at least B− in Biology 1G06; or registration in a programme for which Biology 2E03 is required.

BIOLOGY 2F03 FUNDAMENTALS OF ECOLOGY
A broad overview of ecology at the level of organisms, populations and communities.
3 lects.; one term
Prerequisite: Completion of Biology 1A06; or a grade of at least B− in Biology 1G06.

BIOLOGY 3A06 STRUCTURE, FUNCTION AND DEVELOPMENT OF PLANTS
Ultrastructure, anatomy and development of higher plants in relation to growth conditions and physiological activities.
2 lects., 1 lab.(3); two terms
Prerequisite: Biology 2B03 and Biology 2D03.

BIOLOGY 3AA3 FUNDAMENTAL CONCEPTS OF PHARMACOLOGY
Drug interaction with living organisms; receptor theory of drug action; drug absorption, elimination, toxicity, design; individual variations in drug action; drug-drug interactions; society and drugs.
3 lects., or 2 lects., 1 tut.; one term
Prerequisite: Chemistry 2O06 or 2B06, and registration or credit in Biology 3U06. Not open to students who have credit or are registered in Biochemistry 4Q03.

BIOLOGY 3C03 MICROBIOLOGY II
Basic energy-yielding mechanisms; biochemical and genetic regulation of morphogenesis; microbial life under extreme conditions.
3 lects.; one term
Prerequisite: Biology 3E03.

BIOLOGY 3D03 ANIMAL PARASITOLOGY
Parasites of animals, dealing with life histories, host-parasite relationships, and arthropod vectors.
2 lects., 1 lab.(3); one term
Prerequisite: Biology 2E03.

BIOLOGY 3E03 MICROBIOLOGY I
The biology of the prokaryotic cell. Structure, reproduction, nutrition, identification, and ecology of bacteria.
2 lects., 1 lab.(3); one term
Prerequisite: Chemistry 2O06, 2O08, 2D03 or 2D04, or 2B06.

BIOLOGY 3F06 COMPARATIVE ANATOMY AND EVOLUTION OF VERTEBRATES
An introduction to the development of structure and function in vertebrates.
2 lects., 1 lab.(3); two terms
Prerequisite: Biology 2E03; or permission of the instructor.

BIOLOGY 3H03 SUBCELLULAR STRUCTURE AND FUNCTION
Structure and function of various subcellular components; concept of cellular compartmentalization; mechanism and regulation of gene expression in eukaryotic cells.
3 lects., or 2 lects., 1 lab. (3); one term
Prerequisite: Biology 2B03. Not open to students who have completed Biology 3H06.

BIOLOGY 3HH3 CELL PROLIFERATION AND CELL-CELL INTERACTION
Cell growth and proliferation; cell cycle analysis; behaviour of cells in tissue culture; cell-cell recognition and interaction; transport of micro- and macromolecules across membranes; cytoskeleton and cell motility.
3 lects., or 2 lects., 1 lab.(3); one term
Prerequisite: Biology 2B03. Not open to students who have completed Biology 3H06.

BIOLOGY 3I03 CYTOGENETICS
Karyotype analysis—morphological and biochemical. Structural changes in chromosomes and their effects on fertility. Chromosome polymorphism in man and other organisms: inversions, translocation, deletions, duplications.
3 lects. or 2 lects., 1 tut.; one term
Prerequisite: Biology 2B03 and 2C03.

BIOLOGY 3J03 THE GENETIC BASIS OF EVOLUTION
A survey of the conceptual foundations of evolutionary processes.
3 lects. or 2 lects., 1 tut.; one term
Prerequisite: Biology 2C03.

BIOLOGY 3K06 ANIMAL HISTOLOGY
The structure, function, and organization of cells, tissues, organs and organ systems.
2 lects., 1 lab.(3); two terms
Prerequisite: Biology 2E03; or a grade of at least B– in Biology 1G06; or permission of the instructor.

BIOLOGY 3MM3 INTRODUCTION TO BIOLOGY OF INVERTEBRATES
Analysis of form, function and life cycle in selected groups.
2 lects., 1 lab.(3); one term
Prerequisite: Biology 2E03.
Not open to students who have credit in Biology 3M06.

BIOLOGY 3N06 DEVELOPMENTAL BIOLOGY
Comparative and analytical studies of development. Processes of growth, cell differentiation and morphogenesis will be emphasized; similarities between plant and animal development will be discussed.
2 lects., 1 lab.(3); two terms
Prerequisite: Biology 2B03, 2C03.

BIOLOGY 3O03 MICROBIAL GENETICS
The genetics of bacteriophages, bacteria and fungi. Special emphasis will be placed on relationships between microbial genetics and general problems in genetics.
2 lects., 1 tut.; one term
Prerequisite: Biology 2C03.

BIOLOGY 3P03 CELL PHYSIOLOGY
Cell function with emphasis on cell membranes and transport processes. A quantitative physiochemical interpretation of the electrical properties of cells.
2 lects., 1 tut.; one term
Prerequisite: Biology 2B03 and registration, or credit, in one of Biochemistry 3A06, 3B03 or 3G06; or permission of the instructor.

BIOLOGY 3Q03 RADIATION BIOLOGY
The effects of radiation upon biological material at the physical, molecular, cellular, tissue, and organismal levels. Applications of radiation in medicine and industry.
3 lects.; one term
Prerequisite: Biology 1A06; or a grade of at least B– in Biology 1G06; and one of Physics 1A06, 1A07, 1B06, 1B07, 1C06, 1C07; or permission of the instructor.

BIOLOGY 3SS3 POPULATION ECOLOGY
Population structure and dynamics. Natural selection and regulation of organisms by environmental and biological factors. An evolutionary view of predation, competition, life history schedules.
2 lects., 1 lab.(3); one term
Prerequisite: Biology 2F03; or permission of the instructor. One of Computer Science 1B03, 1MA3, 1ZA3 and Statistics 2R06 are highly recommended.

BIOLOGY 3T03 TUTORIAL IN BIOLOGY
Analysis of classical and current concepts in biological thought; methodology of studying original literature and essay preparation. Students will prepare and present essays and seminars.
3 lects. or sessions; one term
Prerequisite: Only students registered in Level III of a programme in Biology and who have a C.A.A. of at least 9.0 will be admitted.
Not open to students who have credit or are registered in Psychology 3Z03.
Enrolment is Limited.

BIOLOGY 3TT3 COMMUNITY ECOLOGY
Community structure; succession; patterns of diversity and their relevance to conservation; elements of biological control; energy flow; nutrient cycling and climatic influences.
2 lects., 1 lab.(3); one term
Prerequisite: Biology 2F03; or permission of the instructor. One of Computer Science 1B03, 1MA3, 1ZA3 and Statistics 2R06 and Biology 2D03 or 2E03 are recommended.

BIOLOGY 3U06 PRINCIPLES OF ANIMAL PHYSIOLOGY
Animal physiological systems including: circulation, respiration, acid-based and electrolyte balance, renal function, nervous and hormonal control systems.
2 lects., 1 lab.(3); two terms
Prerequisite: Biology 2B03 with a grade of at least B+, or registration in a programme in which Biology 3U06 is required. Biochemistry 3G06 is recommended. As enrolment is limited, if space is available, permission of the instructor may be sought in September by students with credit in Biology 2B03.
Enrolment is limited.

BIOLOGY 3W03 THE ECOLOGY OF NORTHERN PLANT ASSOCIATIONS
The plant ecology of polar desert, tundra and boreal forest ecosystems. Topics include climate, soils, communities, limitations to growth, disturbance and plant-animal interactions.
3 lects., one term
Prerequisite: Biology 2F03 and one of Biology 2D03 or 2E03.

BIOLOGY 4B06 PLANT PHYSIOLOGY
Principles of physiology and metabolism in plants. Topics include: aspects of photosynthesis, nitrogen assimilation, cell wall biosynthesis, hormone action and biotechnology as related to plants.
2 lects., 1 tut. or 1 lab.(3); two terms
Prerequisite: Registration in, or completion of, Biochemistry 3A06 or 3G06; or completion of Biochemistry 2A03; or permission of the instructor.

BIOLOGY 4B03 PLANT PHYSIOLOGY
The regulation of plant metabolism with a major emphasis on carbon flow, light reactions of photosynthesis and the relationship of these reactions to chloroplast development.
2 lects., 1 tut.; one term
Prerequisite: Registration in or completion of, Biochemistry 3A06 or 3G06; or completion of Biochemistry 2A03. Not open to students registered in, or who have completed Biology 4B04 or 4B06. To be given concurrently with 4B06.

BIOLOGY 4C08 SENIOR THESIS
A thesis based upon a research project carried out under the direction of a member of the Faculty.
Prerequisite: Approval by the Chairman in the preceding spring term. Open to students who have obtained a CAA of at least 10.0 and are registered in Level IV Honours Biology or Honours Biology and Psychology. Not open to students with credit, or registration, in Biology 4F04.

BIOLOGY 4D03 THE ECOLOGICAL DESIGNS OF ORGANISMS
Principles of organism design from an ecological/evolutionary perspective. Overviews of fitness, morphology, resource allocation and behaviour. Relevant to ecologists, physiologists and genetic engineers.
2 lects., 1 lab.(3); one term
Prerequisite: Biology 2F03; or permission of the instructor. Biology 3SS3 or 3J03 is strongly recommended.

BIOLOGY 4E03 POPULATION GENETICS
Experimental and theoretical aspects of the genetic basis of evolutionary changes in populations.
2 lects., 1 tut.; one term
Prerequisite: Biology 3J03 and Biology 2C03 and one of Mathematics 1F06, 1A06.

BIOLOGY 4F04 SENIOR PROJECT
Students may enlarge their background in a field of specialization through an experimental or library project under the direction of a member of the Faculty.
Prerequisite: Approval by the Chairman in the preceding spring term. Open to students registered in a Level IV Biology programme. Not open to students with credit, or registration, in Biology 4C08.

BIOLOGY 4H03 PLANT DEVELOPMENT
An experimental analysis of development in plants: cytological, genetical, and biochemical studies.
3 lects.; one term
Prerequisite: Biology 2D03.

BIOLOGY 4I03 IMMUNOLOGY
An introduction to humoral and cellular immunity. The molecular and cellular basis of immunity, and an introduction to immunological techniques.
2 lects., 1 tut.(2); one term
Prerequisite: Registration or credit in, one of Biochemistry 3A06, 3B03 or 3G06; or permission of the instructor.

BIOLOGY 4J03 FIELD EXERCISES IN ECOLOGY
Field projects focusing on local plants and animals in terrestrial and aquatic habitats. Students may propose a specific topic.
1 tut., 1 lab.(3); one term
Prerequisite: Biology 2F03, and registration or credit in one of Biology 3SS3, 3TT3, 3S06; or permission of the instructor.

BIOLOGY 4M03 MOLECULAR ASPECTS OF EUKARYOTIC CHROMOSOMES
Chromatin structure, repeated DNA sequences, concerted evolution of gene families, telomeres, centromeres, gene transfer, oncogenes, transposable elements.
3 lects.; one term
Prerequisite: Completion of Biochemistry 3A06 and 3C03, or Biochemistry 3G06 and Biology 3O03.
Same as Molecular Biology 4D03 and Biochemistry 4F03.

BIOLOGY 4MM3 REPLICATION AND RECOMBINATION
Replication, recombination, repair and mutagenesis of DNA.
3 lects.; one term
Prerequisite: Completion of Biochemistry 3A06 and 3C03, or Biochemistry 3G06 and Biology 3O03.
Same as Molecular Biology 4E03 and Biochemistry 4H03.

BIOLOGY 4N03 GENE EXPRESSION
An advanced course covering molecular aspects of gene expression in eukaryotes: DNA replication, control of transcription, RNA processing and transport, translation, protein processing and targetting.
3 lects.; one term
Prerequisite: Biochemistry 3A06, 3C03 or 3G06.
Same as Molecular Biology 4C03 and Biochemistry 4E03.

BIOLOGY 4V03 VIROLOGY
The viruses of animals, bacteria, and plants, with emphasis on the molecular biology of virus replication and the diversity of virus-cell interactions.
2 lects., 1 tut.(2); one term
Prerequisite: Registration, or credit, in Biochemistry 3A06, 3B03 or 3G06; or permission of the instructor.

BIOLOGY 4X03 ENVIRONMENTAL PHYSIOLOGY
Advanced physiology of animals with an emphasis on interactions with and adaptation to the environment.
2 lects., 1 lab. (3); one term
Prerequisite: A grade of at least B in Biology 3U06; or permission of the instructor.
Enrolment is limited.

BIOLOGY 4Y03 ECOLOGY OF INLAND WATERS
Physical, chemical and biological inter-relationships of inland waters, including aspects of pollution.
2 lects.; 1 lab.; one term
Prerequisite: Biology 2F03 and one of Biology 2D03 or 2E03.

BIOLOGY 4Z03 SYSTEMATIC BOTANY
Processes of speciation in higher plants, cytological, mathematical, and biochemical methods in plant classification.
2 lects., 1 lab.(3); one term
Prerequisite: Biology 2D03.
Offered in alternate years.

Business

Faculty Notes:

1. The following courses are offered by the Faculty of Business as electives for students in other Faculties. Eligible students will be registered in courses on a first-come/first-served basis.
2. **Business courses are open to students registered in Level III or Level IV of programmes other than Commerce, and Engineering and Management. Business 3Z03 is not open to students registered in the degree programme in Labour Studies.**

BUSINESS 3V03 BUSINESS LAW
An introduction to the relevance of law to the Canadian Business environment. Basic concepts of the judicial process and legal procedures, contracts, primary sources of law, and other aspects of the relationship between business and law will be examined.
3 lects.; one term
Prerequisite: Economics 1A06. Not open to students who have received credit for Commerce 4PD3.
Enrolment limit: 45

BUSINESS 3W06 ACCOUNTING
An introduction to the basic principles and practices of accounting. Major topic areas to be considered include the economic valuation model, the fundamental concepts underlying, and the operation of, the traditional accounting model, external financial reporting and the preparation and use of accounting information for management planning and control.
3 lects.; two terms
Prerequisite: Economics 1A06. Not open to students who have received credit for Commerce 2AA3.
Enrolment Limit: 90

BUSINESS 3X03 BUSINESS FINANCE
An introduction to the theory and practice of business finance. An examination of the major financial decisions that businesses face: the problems of determining the overall level of sources and uses of funds by the firm, the evaluation of alternative uses of funds (capital budgeting and working capital management), and the choice among alternative sources of funds. Analytical approaches to assist with these decisions are developed.
3 lects.; one term
Prerequisite: Business 3W06 or Commerce 2AA3, and Economics 1A06 (Business 3W06 may be taken concurrently with 3X03). Not open to students who have received credit for Commerce 2FA3.
Enrolment Limit: 45

BUSINESS 3Y03 MARKETING
An introduction to the role that marketing plays in our society and in the Canadian economy. The course will take a macro-marketing viewpoint to deal with theoretical and social aspects of the exchanges that take place between organizations and their publics.
3 lects.; one term
Prerequisite: Economics 1A06. Not open to students who have received credit for Commerce 2MA3.
Enrolment Limit: 90

BUSINESS 3Z03 HUMAN RESOURCE MANAGEMENT
An introduction to basic concepts, theories and practice in human resource management. Various problems which arise from the employer-employee relationship as well as the techniques designed to handle them will be considered.
3 lects.; one term
Prerequisite: Economics 1A06. Not open to students who have received credit for Commerce 3BA3, or 3BB3.
Enrolment Limit: 45

Canadian Studies

While the B.A. Programme in *Canadian Studies* has been suspended, several courses with a focus on *Canadian Studies* are available. Students interested in this area may choose from among the following courses, subject to meeting the prerequisites. Further information about these courses may be obtained by contacting Dr R.L. Hyman (English) or Dr. D.R.L. Matthews (Sociology).

There also exists a Canadian Studies Theme of Study within the Humanities Interdisciplinary B.A. programme. Students interested in this theme should consult the Humanities Interdisciplinary B.A. Coordinator, or the Office of the Associate Dean of Humanities (Studies).

CDN ST 1A06 WAYS OF SEEING: A FRAMEWORK FOR CANADIAN STUDIES
An interdisciplinary study of Canada which examines major phases of regional development in Canada on the basis of the relationship between various economic and cultural centres and their respective peripheries or hinterlands. This course will be 'team-taught' by members of the Faculties of Humanities and Social Sciences.
1 lect.(2 hrs), 1 tut.; two terms
Prerequisite: Open. Not available to students with credit in Canadian Studies 2A06.

OTHER RELATED COURSES

HUMANITIES

Art History 3B03	Canadian Art and Architecture
Drama 3BB3	Contemporary Quebec Theatre
English 2C03	Contemporary Canadian Fiction
English 3Z03	Contemporary Canadian Poetry
French 2F03	The Civilization of French Canada I
French 2FF3	The Civilization of French Canada II
French 3AA3	The Modern French Canadian Novel
French 3BB3	Contemporary Quebec Theatre
French 4U03	Topics in French-Canadian Literature
History 2J06	The History of Canada
History 3C03	The Indian in Eastern Canada
History 3KK6	Canada in the 20th Century
History 3V06	The People of Ontario, 1790-1940: An Introduction to Regional Social History
History 4N06	Canadian Historiography
Music 3T03	Studies in Canadian Music

SOCIAL SCIENCES

Anthropology 3A03	Ethnology: The Canadian North
Anthropology 3F03	Contemporary Northern Peoples
Economics 2K03	Economic History of Canada
Economics 3C06	Public Finance
Geography 2E03	Canada
Geography 3D03	Historical Geography of Canada
Geography 4U03	Selected Problems in Urban Planning
Geography 4Z03	Advanced Cultural Geography
Political Science 2G06	Politics in Canada
Political Science 3DD6	Political Parties, Movements and Elites in Canada
Political Science 3GG3	Politics of Federalism
Political Science 3I06	Canadian Political Ideas
Political Science 4S06	Canadian Political Theory
Religious Studies 3B03	Native and Ethnic Religions in Canada
Religious Studies 3BB3	Major Denominations in Canada
Sociology 2H06	A Sociological Analysis of Canadian Society
Sociology 3BB3	Major Denominations in Canada (*Same as Religious Studies 3BB3*)
Sociology 3Q03	Native and Ethnic Religions in Canada (*Same as Religious Studies 3B03*)
Sociology 4O03	Regionalism and Regional Development in Canada

Ceramics

(See *Materials Science and Engineering, Ceramics*)

Chemical Engineering

Faculty as of January 15, 1989

J.F. MacGregor/*Chairman*

Professor Emeritus

Leslie W. Shemilt/B.A.Sc., Ph.D. *(Toronto)*, M.Sc. *(Manitoba)*, F.R.S.C., F.C.A.E., F.C.I.C., F.A.I.Ch.E., F.E.I.C., P.Eng.

Professors

Malcolm H.I. Baird/B.Sc. *(Glasgow)*, Ph.D. *(Cambridge)*, F.C.I.C., P.Eng.
John L. Brash/B.Sc., Ph.D. *(Glasgow)*
Cameron M. Crowe/B.Eng. *(McGill)*, Ph.D. *(Cambridge)*, F.C.I.C., P.Eng.
Irwin A. Feuerstein/B.Chem.Eng. *(City College of New York)*, M.S. *(Newark College of Engineering)*, Ph.D. *(Massachusetts)*
Alvin E. Hamielec/B.A.Sc., M.A.Sc., Ph.D. *(Toronto)*, F.R.S.C., P.Eng./ NSERC Industrial Research Chair in Polymer Production Technology.
Kenneth D. Hester/B.A., B.A.Sc. *(British Columbia)*, M.B.A. *(McMaster)*/part-time
Terrence W. Hoffman/B.Sc., M.Sc. *(Queen's)*, Ph.D. *(McGill)*, F.C.I.C., P.Eng./part-time
John F. MacGregor/B.Eng. *(McMaster)*, M.Sc., Ph.D. *(Wisconsin)*
Thomas E. Marlin/B.S. *(State University of New York)*, M.S. *(Dayton)*, Ph.D. *(Massachussetts)*/NSERC Industrial Research Chair in Process Control.
John Vlachopoulos/Dipl. Ch. Eng. *(Nat. Tech. Univ. of Athens)*, M.S., D.Sc. *(Washington, St. Louis)*, F.C.I.C., P.Eng.
Donald R. Woods/B.Sc. *(Queen's)*, M.S., Ph.D. *(Wisconsin)*, F.C.I.C., P.Eng.
Joseph D. Wright/B.Sc. *(Alberta)*, Ph.D. *(Cambridge)*, P.Eng./part-time

Associate Professors

Andrew Benedek/B.Eng. *(McGill)*, Ph.D. *(Washington)*/part-time
Robert H. Pelton/B.Sc., M.Sc. *(Guelph)*, Ph.D. *(Bristol)*
Paul A. Taylor/B.Sc., Ph.D. *(Univ. of Wales)*, P.Eng.
Marios Tsezos/Dipl. Mining Metallurgical Eng. *(Nat. Tech. Univ. of Athens)*, M. Eng. *(McMaster)*, Ph.D. *(McGill)*, P. Eng.
Philip E. Wood/B.A.Sc. *(Waterloo)*, Ph.D. *(California Inst. Tech.)*

Assistant Professors

James M. Dickson/B.A.Sc., M.A.Sc. *(Waterloo)*, Ph.D. *(Virginia Tech.)*
Andrew N. Hrymak/B.Eng. *(McMaster)*, Ph.D. *(Carnegie-Mellon)*.
S. Steven Treiber/B.Eng., Ph.D. *(McGill)*, M.A.Sc. *(Toronto)*/part-time
Siraramam Vijayan/B.Sc. *(Madras)*, B.Tech., M.Tech. *(IIT)*, M.Sc.E. *(New Brunswick)*, D.Sc.Tech. *(Swiss Fed. Inst. of Tech.)*/part-time

Department Note:

The Department of Chemical Engineering reserves the right to withdraw permission to take a second term course if a prerequisite first term course is not completed.

CHEM ENG 2C02 TECHNICAL COMMUNICATIONS AND MEASUREMENTS
How to obtain, interpret, store, retrieve, manipulate and communicate information. T.V. taping to improve verbal communication, searching the literature, organization, laboratory measurements and treatment of data.
1 lect., both terms; 1 lab.(3), both terms, alternate weeks
Prerequisite: Registration in Level II Chemical Engineering or Chemical Engineering and Management; or permission of the Department.

CHEM ENG 2D04 CHEMICAL ENGINEERING PRINCIPLES I
Steady-state mass balances in chemical processes and the first law of thermodynamics. The behaviour of gases and liquids, and their physical equilibria. Recycle in steady state operation.
3 lects., 1 tut.(3); first term
Prerequisite: Registration in Level II Chemical Engineering, Chemical Engineering and Management or Honours Applied Chemistry; or permission of the Department.

CHEM ENG 2F04 CHEMICAL ENGINEERING PRINCIPLES II
Combined mass and energy balances in the steady and unsteady state. The second law of thermodynamics and physical chemical equilibria.
3 lects., 1 tut.(3); second term
Prerequisite: Credit or registration in Chemical Engineering 2D04.

CHEM ENG 2G03 PROBLEM SOLVING AND COMPUTER SIMULATION
Developing awareness, strategies, creativity, analysis and interpersonal skills in the context of solving homework problems and projects. Steady state computer simulation, executive systems and their applications. Development of advanced computer programming skills.
1 lect., 2 tut.(3); first term
Prerequisite: Engineering 1D04 and credit or registration in Chemical Engineering 2D04, 2F04, 2C02.

CHEM ENG 2O04 FLUID MECHANICS
The laws of statics and dynamics in both compressible and incompressible fluids. Equations of conservation and modern turbulence and boundary layer theory applied to submerged and conduit flow. Similitude, unsteady flow, measuring devices and fluid machinery.
3 lects., 1 tut. or lab.(3); second term
Prerequisite: Mathematics 2M06, or 2P04 and 2Q04, any of which may be taken concurrently.

CHEM ENG 3A04 HEAT TRANSFER
Heat transfer in chemical engineering systems. Steady and unsteady state conduction, natural and forced convection, radiant heat transfer, condensation of vapour and boiling.
3 lects., 1 tut.; first term
Prerequisite: Chemical Engineering 2F04, 2O04.

CHEM ENG 3D03 CHEMICAL ENGINEERING THERMODYNAMICS
Review of the total energy balance and mechanical energy balance. Theoretical and practical cycles, including compression and refrigeration. Chemical reaction and phase equilibria of multicomponent systems, with emphasis on non-ideality. Thermodynamic analysis of processes.
2 lects., 1 tut.; first term
Prerequisite: Chemical Engineering 2F04.

CHEM ENG 3E03 PROCESS MODEL FORMULATION AND SOLUTION
Formulation of models for various chemical processing units in the steady and unsteady states. Techniques for numerical solution of model equations, including algebraic and ordinary differential equations, both linear and non-linear.
3 lects.; first term
Prerequisite: Chemical Engineering 2F04.

CHEM ENG 3G03 SIMULATION, MODELING AND PROBLEM SOLVING
Computer programming, executive programs modeling heat exchangers, separators and reactors. Creativity, analysis, heuristics and defining open-ended problems.
1 lect., 2 tuts.(2); second term
Prerequisite: Chemical Engineering 2G03 or Commerce 3QB3, and credit or registration in Chemical Engineering 3A04, 3E03, 3K03, 3M04.

CHEM ENG 3K03 INTRODUCTION TO REACTOR DESIGN
Stoichiometry of multiple reactions, kinetics of homogeneous reactions, interpretation of batch data, design of CSTR and plug flow idealized reactors.
3 lects.; second term
Prerequisite: Credit or registration in Chemical Engineering 3D03, 3E03; or registration in Level III or IV Honours Applied Chemistry.

CHEM ENG 3L02 INTERMEDIATE LABORATORY SKILLS
Experiments and projects in heat transfer, thermodynamics, mass transfer, process control and fluid mechanics.
1 lect., 1 lab. (3); second term
Prerequisite: Chemical Engineering 2O04, and credit or registration in Chemical Engineering 3A04, 3D03, 3M04, 3P03.

CHEM ENG 3M04 MASS TRANSFER AND STAGEWISE OPERATIONS
Stagewise operations, diffusion, mass transfer coefficients, distillation, differential contacting and absorption.
3 lects., 1 tut. (2); second term
Prerequisite: Chemical Engineering 2F04.

CHEM ENG 3P03 PROCESS CONTROL
Transient behaviour of chemical processes. Theory and practice of automatic control. Introduction to computer process control.
3 lects.; second term
Prerequisite: Mathematics 2M06, and credit or registration in Chemical Engineering 3E03; or permission of the Department.

CHEM ENG 4B03 POLYMER REACTION ENGINEERING
Classification of polymeric materials. Kinetics of polymerization reactions: condensation, free radial, ionic and anionic coordination polymerization. Copolymerization, emulsion and suspension polymerization. Solution properties. Characterization of polymers: MW, MWD and tacticity. Solid state structure: structure-property relations.
3 lects.; first term
Prerequisite: Registration in Level IV Chemical Engineering or Level V Chemical Engineering and Management; or permission of the Department.

CHEM ENG 4C03 STATISTICS FOR ENGINEERS
Linear regression analysis in matrix form, non-linear regression, multi-response estimation, design of experiments including factorial and optimal designs. Special emphasis on methods appropriate to engineering problems.
3 lects.; second term
Prerequisite: One of Statistics 3M03, 3N03, 3Y03, and permission of the Department.

CHEM ENG 4D03 DISPERSED PHASE AND PARTICLE PROCESSING
Particle size characterization, filtration, fluidization, sedimentation, centrifugation and flotation.
3 lects.; second term
Prerequisite: Registration in Level IV Chemical Engineering or Level V Chemical Engineering and Management.

CHEM ENG 4E03 DIGITAL COMPUTER PROCESS CONTROL
Sampled data control systems: z-transform methods, design of digital controllers; advanced digital control techniques: dead time compensation, feedforward, multivariable systems.
3 lects.; first term
Prerequisite: Chemical Engineering 3P03 and permission of the Department.

CHEM ENG 4K03 REACTOR DESIGN
Non ideal flow, mixing, catalytic kinetics, packed, fluidized bed reactors. Two phase reactors.
3 lects.; second term
Prerequisite: Chemical Engineering 3K03; or permission of the Department.

CHEM ENG 4L02 ADVANCED LABORATORY SKILLS
Experiments and projects in transport phenomena, reaction kinetics and reactor design.
1 lab. (3), 1 lect.; first term
Prerequisite: Chemical Engineering 3L02, and registration in Level IV Chemical Engineering or Level V Chemical Engineering and Management.

CHEM ENG 4M03 SEPARATIONS
Distillation column design; transport phenomena, laminar, turbulent and unsteady state mass transfer; analogies; adsorption, extraction, absorption, ion exchange, drying, humidification, crystallization.
3 lects.; first term
Prerequisite: Chemical Engineering 2O04, 3A04, 3M04.

CHEM ENG 4N04 ENGINEERING ECONOMICS AND PROBLEM SOLVING
Engineering economics, capital and operating cost estimation, selecting/sizing process equipment, optimization. Ethics, with problem solving components. Self assessment and self-directed learning.
3 lects., 1 tut.(2); first term
Prerequisite: Chemical Engineering 3A04, 3E03, 3G03, 3K03, 3M04, 3P03.

CHEM ENG 4T03 TRANSPORT PROCESSES IN BIOMEDICAL ENGINEERING
Analytical, experimental and design principles and chemical engineering skills for solving problems in biological flow systems, e.g. haemodynamics, extracorporeal oxygenator, artificial kidney and artery disease.
3 lects.; second term
Prerequisite: Chemical Engineering 2O04; or permission of the Department.

CHEM ENG 4W04 CHEMICAL PLANT DESIGN AND SIMULATION
Projects, often in cooperation with industry, usually involve steady-state computer simulation of an existing process or design of a new process. Plant equipment may be tested to develop simulation models.
2 project labs.(3); both terms. The hours assigned can be freely scheduled to suit those involved in a particular project and may include computation classes, laboratory work, discussions, or individual study.
Prerequisite: Registration in Level IV Chemical Engineering or Level V Chemical Engineering and Management.

CHEM ENG 4Y04 UNDERGRADUATE RESEARCH PROJECT
Research projects with students working on their own under the direction of a Faculty member.
2 labs.(3); both terms.The hours assigned can be freely scheduled to suit those involved in a particular project and may include computation classes, laboratory work, discussions, or individual study.
Prerequisite: Registration in Level IV Chemical Engineering or Level V Chemical Engineering and Management, and a Cumulative Engineering Average of at least 9.5.

CHEM ENG 4Z03 COLLOIDS, SURFACE PHENOMENA AND UNIT OPERATIONS
The properties of colloids and surfaces and their use in the design of reactors and separators. Includes stability of colloids, double layer phenomena, wetting, flocculation coagulation, surface equations of change, particle size measurements.
3 lects.; second term
Prerequisite: Registration in Level IV Chemical Engineering or Level V Chemical Engineering and Management.

ENGINEER 4U03 UNIT OPERATIONS AND PROCESSES IN ENVIRONMENTAL ENGINEERING
Offered jointly by the Departments of Chemical Engineering and Civil Engineering and Engineering Mechanics. The process capabilities, hardware and design equations, of the physical, chemical and biological processes used to improve water. Emphasis on processes such as bio-oxidation, clarification, coagulation, sludge dewaterings and disinfection.
2 lects. 1 tut.; first term
Prerequisite: Chemical Engineering 2O04, or Civil Engineering 3O04, or Mechanical Engineering 3O04, and registration in Level IV or above of any Engineering programme.

For **Graduate courses**, see the *Calendar of the School of Graduate Studies*.

Chemistry

Faculty as of January 15, 1989

J. Warkentin/*Chairman*

Professors Emeriti

Arthur N. Bourns/O.C., B.Sc., D.Sc.*(Acadia)*, Ph.D. *(McGill)*, D.Sc. *(Acadia, McGill, University of New Brunswick, McMaster)*, LL.D. *(Brock)*, F.R.S.C., F.C.I.C.
Ronald J. Gillespie/B.Sc., Ph.D., D.Sc. (*London*), F.R.S., F.R.S.C., F.R.S.C. (U.K.), F.C.I.C.
Ronald P. Graham/M.A. (*Queen's*), A.M., Ph.D. (*Columbia*), F.C.I.C.
Henry G. Thode/C.C., M.B.E., B.Sc., LL.D. (*Regina,Saskatchewan*), Ph.D. (*Chicago*), D.Sc. (*Toronto, British Columbia, Acadia, Laval, Royal Military College, McGill, Queen's, McMaster, York*), F.R.S., F.R.S.C., F.C.I.C.
Richard H. Tomlinson/B.Sc. (*Bishop's*), Ph.D. (*McGill*), F.C.I.C.

Professors

Richard F.W. Bader/B.Sc., M.Sc. (*McMaster*), Ph.D. (*M.I.T.*), F.R.S.C., F.C.I.C.
Russell A. Bell/M.Sc. (*Wellington*), M.S. (*Wisconsin*), Ph.D. (*Stanford*), F.C.I.C.
Thomas Birchall/ Ph.D. (*McMaster*), F.R.S.C.(U.K.), C. Chem.(U.K.), F.C.I.C.
Ronald F. Childs/B.Sc. (*Bath Univeristy of Technology*), Ph.D., D.Sc. (*Nottingham*)
Alfio Corsini/B.Sc., Ph.D. (*McMaster*), F.C.I.C.
Peter T. Dawson/B.Sc. (*Birmingham*), Ph.D. (*Cambridge*)
Donald R. Eaton/M.A., D.Phil. (*Oxford*)
John E. Greedan/B.A. (*Bucknell*), Ph.D. (*Tufts*), F.C.I.C.
Orville E. Hileman, Jr./B.S.Ed. (*Bowling Green State*), Ph.D. (*Case Institute of Technology*), F.C.I.C.
Herbert L Holland/M.Sc. (*Warwick*), Ph.D. (*Queen's*)/part-time
Gerald W. King/B.Sc., Ph.D., D.Sc. (*London*), F.R.S.C., F.R.S.C.(U.K.), C.Chem. (U.K.), F.C.I.C.
Joseph D. Laposa/B.Sc. (*St. Louis*), M.S. (*Chicago*), Ph.D. (*Loyola*)
Colin J.L. Lock/B.Sc., Ph.D. (*London*), A.R.C.S., D.I.C., F.R.S.C.(U.K.), F.C.I.C.
David B. MacLean/B.Sc. (*Acadia*), Ph.D. (*McGill*), F.R.S.C., F.C.I.C.
Michael J. McGlinchey/B.Sc., Ph.D. (*Manchester*), F.C.I.C.
David P. Santry/B.Sc., Ph.D. (*London*)
Gary J. Schrobilgen/B.Sc. (*Dubuque, Iowa*), M.Sc. (*Brock*), Ph.D. (*McMaster*)
Ian D. Spenser/B.Sc. (*Birmingham*), Ph.D., D.Sc. (*London*), F.R.S.C., F.R.S.C.(*U.K.*), F.C.I.C.
Johan K. Terlouw/B.Sc., M.Sc., Ph.D. *(Utrecht)*
John Warkentin/B.Sc., M.Sc. (*Manitoba*), Ph.D. (*Iowa State*), F.C.I.C.
Nick H. Werstiuk/B.Sc. (*Alberta*), M.A., Ph.D. (*Johns Hopkins*), F.C.I.C.

Associate Professors

Alexander D. Bain/B.Sc. (*Toronto*), M.Sc. (*British Columbia*), Ph.D. (*Cambridge*)
Adam P. Hitchcock/B.Sc. (*McMaster*), Ph.D. (*British Columbia*)
David A. Humphreys/B.Sc., M.Sc. (*London*), Ph.D. (*McMaster*)
William J. Leigh/B.Sc., M.Sc., Ph.D. (*Western*)
Brian E. McCarry/B.Sc. (*British Columbia*), Ph.D. (*Stanford*)
A. John Yarwood/B.Sc., Ph.D. (*Birmingham*)

Assistant Professors

Jacques Barbier/M.Sc. (*Toronto*), Ph.D. (*ANU*)
Michael A. Brook/B.Sc. (*Toronto*), Ph.D. (*McGill*)
Randall S. Dumont/B.Sc. (*Western*), Ph.D. (Toronto)
Timothy A. Wildman/B.Sc., M.Sc., Ph.D. (*Manitoba*)

CHEMISTRY

Associate Members

I. David Brown/(*Physics*) B.Sc., Ph.D. (*London*) F.C.I.C.
Richard M. Epand/(Biochemistry) AB (*Johns Hopkins*), Ph.D. (*Columbia*)
Walter F. Kean/(*Medicine*) M.B., Ch.B. (*Glasgow*) F.R.C.P.(C), F.A.C.P.
Robert H. Pelton (Chemical Engineering)/M.Sc. (*Guelph*), Ph.D. (*Bristol*)

Department Notes:

1. ★ Course not necessarily offered every session.
2. Students not in a Science programme should note that Chemistry 1A06, 1B06 or 1B07 serves as a prerequisite for Chemistry 2D03. Also, Chemistry 2D03 is a prerequisite for Biochemistry 2E03.

CHEM 1A06 INTRODUCTORY CHEMISTRY
First Term: An introduction to inorganic chemistry; molecular structure and equilibrium. Second Term: An introduction to organic chemistry and kinetics. The laboratory is designed to illustrate the lecture material and co-ordinates with it.
3 lects., 1 tut., 1 lab.(3) every other week; two terms
Prerequisite: Grade 13 or OAC Chemistry

CHEM 1C03 GENERAL CHEMISTRY
A general interest course in Chemistry discussing topics relevant to society and the environment.
3 lects.; one term
Prerequisite: A minimum of one High School Chemistry course. Not open to students in Science or Engineering. Not open to students with credit in Chemistry 1B06.

CHEM 1E03 GENERAL CHEMISTRY FOR ENGINEERS I
An introductory course for Engineering students, emphasizing molecular structure and equilibria. A laboratory provides experience in experimental techniques and accurate measurement.
3 lects., 1 tut.(1), 1 lab.(3) every other week; first term
Prerequisite: Grade 13 or OAC Chemistry and registration in an Engineering programme. Not open to students who are registered in or have credit in Chemistry 1A06.

CHEM 2A03 ANALYTICAL CHEMISTRY I
An introduction to the basic principles of analytical chemistry, with particular emphasis on solution equilibria. Applications to classical methods of analysis.
2 lects., 2 labs.(3); one term
Prerequisite: Registration in a Chemistry programme. Not open to students who are registered in, or who have credit in any of Chemistry 2K03, 2M05, 2N03, 3K03.

CHEM 2B06 ORGANIC CHEMISTRY
A systematic treatment of mono- and di-functional organic compounds and an introduction to spectroscopic techniques for structure determination.
2 lects., 1 lab(3); two terms
Prerequisite: Registration in a Chemistry programme. Not open to students who are registered in, or who have credit in Chemistry 2O06.

CHEM 2C03 STRUCTURE AND REACTIONS OF THE MAIN GROUP ELEMENTS
Comparative chemistry of the non-transition elements; introduction to symmetry.
3 lects., 1 lab.(3); one term
Prerequisite: Registration in a Chemistry programme; or permission of the instructor. Not open to students who are registered in, or have credit in, Chemistry 2F03 or 2W03.

CHEM 2D03 INTRODUCTORY ORGANIC CHEMISTRY
An introduction to the chemistry of monofunctional aliphatic and aromatic compounds.
3 lects., 1 lab.(3); one term
Prerequisite: Chemistry 1A06 or 1B06.

CHEM 2F03 INORGANIC CHEMISTRY
Atomic, molecular and crystal structure; valency and chemical bonding; comparative chemistry of the non-transition elements.
3 lects., 1 lab.(3); one term
Prerequisite: Chemistry 1A06 and registration in B.Sc.(Science); or permission of the instructor. Not open to students who are registered in, or who have credit in Chemistry 2C03 or 2W03.
Not offered in 1989-90.

CHEM 2M05 ANALYTICAL CHEMISTRY
An introduction to classical and modern analytical techniques with an emphasis on applications in Engineering.
1 lect., 1 lab.(3), first term; 2 lects., 1 lab.(3); second term
Prerequisite: Registration in a programme in Chemical Engineering. Not open to students who are registered in, or have credit in, any of Chemistry 2A03, 2K03, 2N03, 3K03.

CHEM 2N03 ANALYTICAL CHEMISTRY
An introduction to the basic principles of analytical chemistry; application to selected classical and instrumental methods of analysis.
2 lects., 1 lab.(3); one term
Prerequisite: One of Chemistry 2P06, 2Q06, or 2T06, any of which may be taken concurrently. Not open to students who are registered in, or have credit in, any of Chemistry 2A03, 2K03, 2M05, 3K03.

CHEM 2O06 ORGANIC CHEMISTRY
An introduction to organic chemistry with emphasis on the reactions of functional groups.
3 lects., 1 lab.(3); two terms
Prerequisite: Chemistry 1A06 with a grade of at least C –, or registration in a programme in which Chemistry 2O06 is required. Not open to students who are registered in, or have credit in Chemistry 2B06 or 2D03.

CHEM 2P06 THERMODYNAMICS
An introduction to the basic principles of thermodynamics, with applications to physical and chemical equilibria, including electrochemistry.
2 lects., 1 lab.(3) or tut.; two terms
Prerequisite: Chemistry 1A06 and Mathematics 1A06 or 1C06 and registration in a programme in Science or Engineering. Not open to students who are registered in, or have credit in, any of Chemistry 2Q06, 2T06, Physics 2H03.

CHEM 2Q06 PHYSICAL CHEMISTRY
Basis of physical phenomena related to biological systems, including thermodynamics, equilibria, transport, and kinetics.
2 lects., 1 lab.(3) or tut.; two terms
Prerequisite: Chemistry 1A06 and one of Mathematics 1A06, 1B03 or 1C06 or Arts and Science 1D06. Not open to students who are registered in, or have credit in, any of Chemistry 2P06, 2T06, Physics 2H03.

CHEM 2W03 INORGANIC CHEMISTRY
Introductory inorganic chemistry of silicates, metals, their oxides and sulphides.
3 lects.; one term
Prerequisite: Chemistry 1A06. Not open to students who are registered in, or have credit in any of Chemistry 2C03, 2F03, 3E06, 3Q03.

CHEM 3A03 ANALYTICAL CHEMISTRY II
An introduction to modern instrumental methods of analysis.
3 lects., 1 lab.(3); one term
Prerequisite: Chemistry 2A03.

CHEM 3B03 QUANTUM CHEMISTRY
An introduction to quantum mechanics and spectroscopy.
2 lects., 1 tut. or 1 lab.(3); first term
Prerequisite: Chemistry 2P06 and one of Mathematics 2O03, 2N03 or 2P04. Not open to students who are registered in, or have credit in Chemistry 3L03 or 3U03.

CHEM 3C03 CHEMICAL REACTION KINETICS
Chemical reaction rates and transport properties. First half of Chemistry 3KK6.
2 lects., or tut. or 1 lab.(3); first term
Prerequisite: Chemistry 2P06 and 3B03 which may be taken concurrently. Not open to students who are registered in, or have credit in Chemistry 3KK6 or 4K06.
First time offered in 1990-91.

CHEM 3D03 ORGANIC CHEMISTRY
A mechanistically-oriented discussion of mono- and polyfunctional organic compounds with emphasis on applications to synthesis.
3 lects., 1 lab.(3); one term
Prerequisite: Chemistry 2B06 and registration in a programme in which Chemistry 3D03 is required. Not open to students who are registered in, or have credit in any of Chemistry 3D06 or 3F03.

CHEM 3E06 TRANSITION METAL INORGANIC CHEMISTRY
The properties, structures, and reactions of inorganic compounds, with emphasis on transition metal chemistry; introduction to organometallic chemistry. Equivalent to Chemistry 3Q03 plus 3P03.
2 lects., 1 lab.(3); two terms
Prerequisite: Chemistry 2C03 and registration in a programme in which Chemistry 3E06 is required. Not open to students who are registered in or have credit in Chemistry 3Q03 or 3P03.

CHEM 3F03 BIO-ORGANIC CHEMISTRY
Special topics in bio-organic chemistry; a sequel to Chemistry 2O06.
2 lects., 1 lab.(3); one term
Prerequisite: Chemistry 2O06.

CHEM 3G03 MODERN PHYSICAL CHEMISTRY II
A continuation of Chemistry 3B03, with application to chemical problems.
2 lects., 1 tut.; one term
Prerequisite: Chemistry 3B03. Not open to students who have credit in, or are registered in Chemistry 3L03 or 3U03.
Last time offered 1989-90.

CHEM 3I03 INDUSTRIAL CHEMISTRY
A survey of the chemical industry. Products obtained from petroleum, natural gas and soda ash. Petrochemicals, synthetic and natural polymers.
3 lects.; one term
Prerequisite: One of Chemistry 2B06, 2D03, 2006, and one of Chemistry 2C03, 2F03 or 2W03, or registration in Level IV of a Chemical Engineering programme.

CHEM 3K03 ANALYTICAL CHEMISTRY
An introduction to modern analytical techniques.
2 lect., 1 lab.(3); one term
Prerequisite: Chemistry 2K03. Not open to students who are registered in, or have credit in, any of Chemistry 2M05, 2N03, 3A03.
Last time offered 1989-90.

CHEM 3KK6 CHEMICAL KINETICS, STATISTICAL MECHANICS AND REACTION RATE THEORY
The rates of chemical reactions in gaseous, condensed and interfacial systems and the molecular processes by which reactions occur. Introduction to statistical mechanics, kinetic theory, transport properties and chemical reaction rate theory.
2 lects., 1 tut. or 1 lab.(3); two terms
Prerequisite: One of Chemistry 2P06, 2Q06 or 2T06 and Chemistry 3B03 which may be taken concurrently, or one of Physics 3Q03, 3M06 or 3M03 and 3MM3. Not open to students who are registered in, or have credit in, any of Chemistry 3C04, 4K06.
First time offered in 1990-91.

CHEM 3L03 INTRODUCTION TO MOLECULAR SPECTROSCOPY
A course introducing group theory and aspects of molecular spectroscopy.
3 lect.; one term
Prerequisite: Chemistry 3U03. Not open to students who are registered in or have credit for Chemistry 3B03.
Last time offered 1989-90.

CHEM 3P03 TRANSITION METAL CHEMISTRY
The chemistry of the heavier transition elements. An introduction to organometallic chemistry and bio-inorganic chemistry. The second half of Chemistry 3E06.
2 lects., 1 lab.(3); second term
Prerequisite: Chemistry 3Q03. Not open to students who are registered in or have credit in Chemistry 3E06.

CHEM 3Q03 INORGANIC CHEMISTRY
The properties, structures and reactions of inorganic compounds with emphasis on transition metal chemistry. The first half of Chemistry 3E06.
2 lects., 1 lab.(3); first term
Prerequisite: Chemistry 2C03, or registration in a programme in which Chemistry 3Q03 is required. Not open to students who are registered in, or have credit in Chemistry 3E06.

CHEM 3U03 QUANTUM CHEMISTRY OF ATOMS AND MOLECULES
An introduction to the principles of quantum mechanics and their application to the electronic structure of atoms and molecules.
3 lects.; one term
Prerequisite: Chemistry 1A06 and one of Mathematics 2O03, 2N03 or 2P04. Not open to students who are registered in or have credit for Chemistry 3B03 or 3G03.
Last time offered in 1989-90.

CHEM 4A03* ADVANCED ORGANIC CHEMISTRY
A discussion of some modern advances in organic chemistry including such topics as aromaticity, molecular rearrangements, and organic photochemistry.
2 lects.; one term
Prerequisite: One of Chemistry 3D03, 3D06, 3F03.

CHEM 4B03* CHEMICAL APPLICATIONS OF SPECTROSCOPY
The applications of spectroscopy to the solution of chemical problems, quantum states and spectra; theory of microwave, infrared, Raman and electronic spectra; gas and tunable lasers.
2 lects.; second term
Prerequisite: Chemistry 3B03 or 3U03 and one of Chemistry 3G03, 3L03 or 4L03.

CHEM 4C03* SOLID STATE CHEMISTRY
Structure and properties of crystalline solids. Topics include crystal chemistry and crystal symmetry, introduction to space groups, defects in ionic crystals, non-stoichiometry, electronic structure and properties of semiconductors and metals.
2 lects.; one term
Prerequisite: One of Chemistry 3E06, 3Q03, and registration in Level IV of a Chemistry programme.

CHEM 4D03* THE CHEMISTRY OF NATURAL PRODUCTS
The structural elucidation and synthesis of selected naturally-occurring organic compounds.
2 lects.; one term
Prerequisite: One of Chemistry 3D03, 3D06, 3F03.

CHEM 4G06 SENIOR THESIS
A thesis based on a project under the direction of a Chemistry Department faculty member.
Prerequisite: Registration in Level IV of an Honours programme in Chemistry. Students registered in Level IV of the Chemistry Major programme, with a CAA of at least 8.5 will also be considered, if sufficient projects are available. Not open to students who are registered in, or have credit in Chemistry 4T06.

CHEM 4K06 CHEMICAL KINETICS
An introduction to statistical mechanics and the kinetic theory of gases. The rates of chemical reactions in gaseous, condensed and interfacial systems, and the molecular processes by which reactions occur.
2 lect., 1 lab.(3) every other week; two terms
Prerequisite: One of Chemistry 3G03, 3U03, Physics 3M06, 3Q03, and registration in Level IV of an Honours or Major Programme in Chemistry.
Offered in 1989-90 and 1990-91 only.

CHEM 4L03 SPECTROSCOPY
A course introducing group theory and aspects of molecular spectroscopy.
2 lects.; first term
Prerequisite: One of Chemistry 3B03, 3U03. Not open to students with credit in Chemistry 3G03 or 3L03.
First time offered 1991-92.

CHEM 4P03* ADVANCED ANALYTICAL CHEMISTRY
A course dealing with modern topics of analytical chemistry.
2 lects.; one term
Prerequisite: One of Chemistry 2M05, 2N03, 3A03, 3K03.

CHEM 4Q03* ADVANCED QUANTUM MECHANICS
Further applications of quantum mechanics to problems of chemical interest.
2 lects.; one term
Prerequisite: One of Chemistry 3B03 or 3U03 or Physics 3M06 or 3M03 and 3MM3, and registration in Level IV of an Honours or Major programme.

CHEM 4R03* ADVANCED TRANSITION METAL CHEMISTRY
A selection from the following topics: mechanisms of reactions involving transition metal ions; homogeneous catalysis; applications of NMR and other physical methods; organometallic chemistry; ligand field theory.
2 lects.; one term
Prerequisite: One of Chemistry 3E06, 3Q03, and registration in Level IV of a Chemistry programme.

CHEM 4S03* ADVANCED MAIN GROUP CHEMISTRY
A selection from the following topics: chemistry of selected main group elements, electron deficient compounds, Mössbauer spectroscopy, theory and application of nuclear and radiation chemistry.
2 lects.; one term
Prerequisite: One of Chemistry 3E06, 3Q03, and registration in Level IV of a Chemistry programme.

CHEM 4T06 INSTRUMENTAL ANALYSIS
Advanced instrumental methods of analysis, with emphasis on general principles, instrumentation, and applications of computers to chemical analysis.
1 lect., 1 lab.(4); two terms
Prerequisite: Registration in Level IV Honours Applied Chemistry or Chemistry Major. Not open to students who are registered in, or have credit in Chemistry 4G06.

CHEM 4U06 ADVANCED EXPERIMENTATION
Fundamental principles of biochemistry and chemistry including modern instrumental methods. Three units selected from Chemistry 4T06 plus Biochemistry 4P03.
2 labs.(4); two terms
Prerequisite: Registration in Level IV Honours Biochemistry and Chemistry. Not open to students are registered in or have credit in any of Biochemistry 4L03, 4P03, Chemistry 4T04, 4T06.
Same as Biochemistry 4U06.

CHEM 4Y03* STATISTICAL THERMODYNAMICS
Principles of statistical thermodynamics and their applications in chemistry.
2 lect., one term
Prerequisite: Chemistry 3KK6 or 4K06, which may be taken concurrently. Not open to students with credit in Chemistry 3Y03, or Physics 3K04.

For **Graduate Courses** see *Calendar of School of Graduate Studies.*

Chinese

Courses in Chinese are administered within the Department of Modern Languages of the Faculty of Humanities. Information and counselling may be obtained from the instructor (Togo Salmon Hall, Room 611).

CHINESE 1Z06 BEGINNER'S INTENSIVE CHINESE
An intensive beginner's course in modern standard (Mandarin) Chinese designed for students with no prior knowledge of the language. Speaking, reading and grammar are equally emphasized. 550 Chinese characters will be taught.
5 hrs.; two terms
Prerequisite: Open. Students who either speak any Chinese dialect or read Chinese, may not register in this course.

Civil Engineering and Engineering Mechanics

Faculty as of January 15, 1989

A.A. Smith/*Chairman*

Professors Emeriti

Gunhard A.E. Oravas/B.Eng., M.S.Civ.Eng., M.S.Eng.Mech., Ph.D. *(Michigan)*, P.Eng.
Hugh Robinson/B.Sc., Ph.D. *(Durham)*, P.Eng.
Nyal E. Wilson/B.A.I., M.A., M.A.I. *(Trinity Coll. Dublin)*, S.M. (Harvard), P.Eng.

Professors

Mark Donelan/B.Eng. *(McGill)*, Ph.D. *(British Columbia)*/part-time

Robert G. Drysdale/B.Sc. *(Manitoba)*, M.A.Sc., Ph.D. *(Toronto)*, P.Eng.
Ahmed Ghobarah/B.Sc. *(Cairo)*, M.Eng., Ph.D. *(McMaster)*, P.Eng.
Frederick L. Hall/A.B. *(Amherst)*, M.S. *(M.I.T.)*, Ph.D. *(Chicago)*
Paul F. Hamblin/B.A.Sc. *(Toronto)*, M.Sc. *(British Columbia)*, Ph.D. *(Seattle)*, P.Eng./part-time
Arthur C. Heidebrecht/B.Sc. *(Alberta)*, M.S., Ph.D. *(Northwestern)*, F.C.S.C.E., P.Eng.
Robert M. Korol/B.A.Sc. *(Toronto)*, M.A.Sc., Ph.D. *(Waterloo)*, F.C.S.C.E., P.Eng.
David C. Lam/B.Sc. *(Hong Kong)*, M.A.Sc. *(Waterloo)*, Ph.D. *(Waterloo)*/part-time
Farooque A. Mirza/B.Sc. *(Karachi)*, B.Eng. *(McGill)*, M.Eng., Ph.D. *(British Columbia)*
Keith L. Murphy/B.A.Sc. *(Toronto)*, M.Sc., Ph.D. *(Wisconsin)*, P.Eng., Texaco Chair in Environmental Engineering Systems
C. Raj Murthy/B.E. *(Mysore)*, M.E. *(Indian Inst. Sc.)*, Ph.D. *(Waterloo)*/part-time
Gilles G. Patry/B.A.Sc., M.A.Sc. *(Ottawa)*, Ph.D. *(California, Davis)*
Alan A. Smith/B.Sc. *(Glasgow)*, Ph.D. *(Strathclyde)*, P.Eng.
Wai K. Tso/B.Sc. *(London)*, M.S., Ph.D. *(Calif. Inst. Tech.)*, P.Eng.

Associate Professors

Brian L. Allen/B.Sc. *(Alberta)*, M.S., Ph.D. *(California, Berkley)*, P.Eng.
Tarek S. Aziz/B.Sc. *(Cairo)*, M.S. *(Carleton)*, D.Sc. *(M.I.T.)*, P.Eng./part-time
Robert G. Horvath/B.A.Sc. *(Windsor)*, M.E.Sc. *(Western Ont.)*, Ph.D. *(Toronto)*, P.Eng.
Joseph K. Lam/B.Sc. *(St. Andrews)*/ part-time
Henryk Melcer/B.Sc., M.Sc., Ph.D. *(Birmingham)*/ part-time
Stan Pietruszczak/B.Sc., M.Sc. *(Warsaw)*, Ph.D. *(Polish Acad., Sci.)*
Arthur Scott/CivEng. Dip. *(Loughborough)*/part-time
William J. Snodgrass/B.A.Sc. *(Waterloo)*, M.S.E.E., Ph.D. *(N. Carolina)*/part-time

Assistant Professors

Brian Baetz/B.A.Sc., M.A.Sc. *(Toronto)*, Ph.D. *(Duke)*, P.Eng.
T. David Chapman/B.A.Sc. *(British Columbia)*, M.Sc. *(London)*, Ph.D. *(Alberta)*/part-time
Pierre L. Côté/B.Ing., M.Sc. *(Ecole Polytechnique)*, Ph.D. *(McMaster)*/part-time
Anthony Gillies/B.E., Ph.D. *(Auckland)*/part-time
Eric R. Hall/B.Sc., M.Sc., Ph.D. *(McMaster)*/part-time
Syed Moin/B.S. *(Osmania)*, M.S. *(Nevada)*, Ph.D. *(McMaster)*/part-time
Bhagwant N. Persaud/B.S. *(Iowa)*, M.Eng., Ph.D. *(Toronto)*/part-time
K.S. Sivakumaran/B.Sc. *(Sri Lanka)*, M.Eng. *(Asian Inst. Tech.)*, Ph.D. *(Calgary)*, P.Eng.
Dieter Stolle/B. Eng., M.Eng., Ph.D. *(McMaster)*, P.Eng.
Ioannis K. Tsanis/Dip.Civ.Eng. *(Aristoteles Univ., Thessaloniki)*, M.A.Sc., Ph.D. *(Toronto)*, P.Eng.
John C. Wilson/B.Eng., M.Eng. *(McMaster)*, Ph.D. *(Caltech.)*, P.Eng.

Lecturer

James MacLeod/B.A.Sc. *(Toronto)*

Associate Member

James R. Kramer/B.Sc. *(M.I.T.)*, M.Sc., Ph.D. *(Michigan)*
Marios Tzesos/Dipl. Mining Metall. Eng. *(Nat. Tech. Univ. Athens)*, M.Eng. *(McMaster)*, Ph.D. *(McGill)*, P.Eng.
John Vlachopoulos/Dipl.Ch.Eng. *(Nat. Tech. Univ. of Athens)*, M.S., D.Sc. *(Washington, St.Louis)*, F.C.I.C.,P.Eng.

CIV ENG 2A02 SURVEYING AND MEASUREMENT
Introduction to measurement and computational techniques of surveying, the theory of measurement and errors, adjustment of observations.
1 lect., 1 lab. (5); first term
Prerequisite: Registration in a programme in Civil Engineering.

CIV ENG 2B02 COMMUNICATIONS AND CIVIL ENGINEERING
Oral and written communication skills, design of engineering studies. A professional liaison programme involving site visits. Concrete mix design and laboratory testing. Introduction to steel-making, ductile behaviour of metals.
1 lect., 1 lab or tut.; first term
Prerequisite: Physics 1D03, and registration in or completion of Engineering 2P04, and registration in a Civil Engineering programme.

CIV ENG 2C04 STRUCTURAL MECHANICS
Unsymmetrical bending, combined axial and flexural loading, shear stresses in thin-walled members, shear centre, plastic deformation, residual stress. Transformations of stress and strain; failure criteria; deflections of statically indeterminate beams; energy method; Castigliano's theorem, column stability; introduction to plate bending.
3 lects., 1 lab.(3); second term
Prerequisite: Engineering 2P04.

CIV ENG 2E02 COMPUTER APPLICATIONS IN CIVIL ENGINEERING
Use of computers in analysis and design; problem definition, program design, implementation and testing. Applied numerical methods. Use of spreadsheets in engineering design and analysis. Graphics and computer-aided design.
1 lect., 1 lab.(3); first term
Prerequisite: Engineering 1D04, and Physics 1D03, and credit or registration in Engineering 2P04, and registration in a Civil Engineering programme.

CIV ENG 2F03 GEOTECHNICAL ENGINEERING I
Composition of soils, soil identification and classification; compaction; seepage theory; effective stress concept; stresses and displacements using elastic solutions; consolidation theory; numerical solutions.
2 lects., 1 lab.(3) or 1 tut.(2) every other week; second term
Prerequisite: Registration in or completion of Civil Engineering 2C04. Not open to students with credit in Civil Engineering 3A03.

CIV ENG 2O03 FLUID MECHANICS
Fluid properties; hydrostatics; continuity, momentum and energy equations and principles; potential flow; laminar and turbulent flow; flow in closed conduits; open channel flow.
2 lects., 1 tut.(1), 1 lab.(2), every other week; second term
Prerequisite: Registration in, or completion of, Engineering 2P04 and Mathematics 2M06.

CIV ENG 3A03 GEOTECHNICAL ENGINEERING I
Composition and characteristics of soils; seepage theory; effective stress concept; stresses and displacements from theory of elasticity; elastic solutions for equilibrium problems in soil mechanics; consolidation theory; Terzaghi's theory of 1-d consolidation; numerical solutions.
2 lects., 1 lab.(3) or 1 tut.(2), every other week; first term
Prerequisite: Civil Engineering 2D03.
Discontinued after December 31, 1989.

CIV ENG 3B03 GEOTECHNICAL ENGINEERING II
Shear strength characteristics and failure criteria for soils; direct shear, triaxial, plane strain and field tests; earth pressure theory; bearing capacity theory; slope stability and embankment analysis.
2 lects., 1 lab.(3) or 1 tut.(2), every other week; second term
Prerequisite: Civil Engineering 3A03.

CIV ENG 3C04 ENGINEERING SYSTEMS
Mathematical models and systems; economic comparison of projects; optimization; linear, non-linear and dynamic programming; simulation and computer-aided design.
3 lects., 1 tut.(2) or lab.(3); second term
Prerequisite: Completion of, or registration in, Civil Engineering 3A03, 3B03, 3G04, 3J04, 3K03, 3M04, 3O04.

CIV ENG 3D03 GEOLOGY FOR ENGINEERS
Composition of earth; classification of rocks and minerals; weathering; geomorphology; subsurface exploration; groundwater; earth movements; case studies.
2 lects. each week, 1 lab.(3) or tut.(2), every other week; second term
Prerequisite: Civil Engineering 2F03 and 3B03.
Not open to students with credit in Civil Engineering 2D03.
First offered in 1991-92.

CIV ENG 3G04 STRUCTURAL ANALYSIS
Deflection of structures by moment area, conjugate beam and virtual work; analysis of indeterminate structures; slope deflection and moment distribution methods; approximate methods and influence lines.
3 lects., 1 lab.(3); first term
Prerequisite: Civil Engineering 2C04.

CIV ENG 3J04 REINFORCED CONCRETE DESIGN
Introduction to concrete technology; design by limit states methods to ensure adequate capacities for bending moment, shear and diagonal tension, axial force, bond and anchorage; and design to satisfy serviceability requirements for deflection and cracking; practical design requirements; interpretation of building code for behaviour of structures.
3 lects., 1 lab.(3); second term
Prerequisite: Credit or registration in Civil Engineering 3G04.

CIV ENG 3K03 INTRODUCTION TO TRANSPORTATION ENGINEERING
Traffic flow characteristics; capacity and control for interrupted and uninterrupted flow roadways; travel demand forecasting.
2 lects., 1 tut.(2); first term
Prerequisite: Engineering 1D03 or 1D04.

CIV ENG 3M04 MUNICIPAL HYDRAULICS
Open channel flow: classification; hydraulic cross-sections; hydraulic jump, design of culverts. Analysis/design of water distribution networks. Analysis and design of wastewater collection systems.
3 lects., 1 lab.(3); second term

Prerequisite: Civil Engineering 2O03 and Mathematics 2M06, and registration in, or completion of, Mathematics 3J04.

CIV ENG 3Q04 WATER QUALITY MODELLING
Sources/uses of water. Characteristics of water: physical, chemical, biological. Reaction kinetics, and materials balances. Mathematical modelling of physical systems. Movement of contaminants in the environment.
3 lects., 1 lab.(3); first term
Prerequisites: Civil Engineering 2O03 and Mathematics 2M06.
Not open to students with credit in Civil Engineering 3O04.

CIV ENG 4A04 ENGINEERING HYDROLOGY
Hydrologic cycle; climate; precipitation; hydrologic abstractions; streamflow analysis; unit hydrograph; frequency analysis; hydrologic routing; rainfall-runoff modelling; urban runoff models; design storms; snow and ice hydrology.
3 lects., 1 lab.(3); first term
Prerequisite: Civil Engineering 3M04.

CIV ENG 4C03 ENVIRONMENTAL PROTECTION
Environmental assessment; energy and elemental cycles; population control; global environmental concerns; solid waste management; hazardous waste management; air quality and control; environmental legislation; environmental economics.
2 lects., 1 tut.(2); second term
Prerequisite: Permission of the Department.

CIV ENG 4D04 GEOMETRIC HIGHWAY DESIGN
Design of various types and classes of streets and highways. Theory and practice in design of intersections, interchanges, arterial highways, and freeways. Design concepts.
3 lects., 1 lab.(2); first term
Prerequisite: Civil Engineering 3K03.

CIV ENG 4F03 TRAFFIC ENGINEERING
Traffic studies; collection, analysis and interpretation of data. Traffic control and management; capacity; isolated intersection, arterial and network signal timing; warrants and use of traffic control devices. Freeway traffic management; surveillance and control strategies/systems.
2 lects., 1 tut.(2); second term
Prerequisite: Civil Engineering 3K03.

CIV ENG 4G03 PAVEMENT MATERIALS DESIGN
Components of highway pavements; ground water and drainage for highway facilities; soil compaction and stabilization; culvert design; aggregates; bituminous and concrete materials, flexible pavement design; concrete pavement design; interlocking pavement structures.
2 lects., 1 lab.(3); second term
Prerequisite: Civil Engineering 3B03.

CIV ENG 4H03 LAND USE AND TRANSPORTATION
Quantitative models to predict transportation flows and land use patterns in urban areas, including gravity-type models, the Lowry model and discrete choice models.
3 lects.; first term
Prerequisite: Civil Engineering 3K03.
Same as Geography 4H03.

CIV ENG 4K03 MODERN METHODS OF STRUCTURAL ANALYSIS
Development and application of matrix methods of structural analysis. Finite element method. Influence lines, elastic stability analysis of frames and introduction to dynamic analysis. Applications of computer programs.
2 lects., 1 tut.(2); first term
Prerequisite: Civil Engineering 3G04 and Mathematics 3J04.

CIV ENG 4L04 DESIGN OF WATER RESOURCES SYSTEMS
Investigation, planning, analysis, and design of water resources systems. Stormwater systems; floodplain analysis; network systems; reservoir analysis, flood control; river engineering.
2 lects., 1 tut., 1 lab. (3); second term
Prerequisite: Civil Engineering 3M04; or permission of the Department.

CIV ENG 4N04 DESIGN OF STEEL STRUCTURES
Limit states design method; design of compression and tension members, beams, beam-columns, composite beams and plate girders; bolted and welded connections; frame design including effects of sway; applications using Canadian steel structures building code.
3 lects., 1 tut.(2); second term
Prerequisite: Civil Engineering 3G04.

CIV ENG 4P03 ADVANCED MECHANICS OF MATERIALS
Theory of elasticity; beam on elastic foundation; bending of curved beams; torsion of non-circular sections; analysis of thin-walled sections; bending of thin plates; energy methods.
3 lects.; first term
Prerequisite: Civil Engineering 3G04.

CIV ENG 4R04 STRUCTURAL SYNTHESIS
Structural design process, gravity and lateral loading requirements, structural performance criteria, choice of structural systems. Approximate analysis of different structural systems, such as frames and shear walls, suitable for preliminary design. Analysis of actual buildings. Use of package computer programme for alternate design comparison.
3 lects., 1 lab.(3); first term
Prerequisite: Civil Engineering 3G04, 3J04.

CIV ENG 4S04 FOUNDATION ENGINEERING
Principles of foundation design; bearing capacity, settlement and location, footings, deep foundations, piles, pile groups and drilled piers; geotechnical techniques and case histories.
3 lects., 1 tut.(2); first term
Prerequisite: Civil Engineering 3B03.

CIV ENG 4X04 ADVANCED HYDRAULICS
Conservation of mass, energy, momentum. Rapidly and gradually varied channel flow; flow transitions. Pumps and pipelines; hydraulic structures, transients; networks; river engineering.
3 lects., 1 lab.(3); first term
Prerequisite: Civil Engineering 3M04 and Mathematics 3J04

CIV ENG 4Y04 ADVANCED REINFORCED AND PRESTRESSED CONCRETE DESIGN
Design of pre-tensioned and post-tensioned prestressed concrete structures. Calculation of losses, ultimate strength and serviceability, secondary bending, end anchorage. Design of reinforced concrete slabs, columns and frames.
3 lects., 1 lab. and/or tut.(2); second term
Prerequisite: Civil Engineering 3G04 and 3J04.

CIV ENG 4Z04 DESIGN OF WATER AND WASTEWATER TREATMENT PLANTS
Design of a complete treatment plant. Water/wastewater characterization, treatment process selection, and process design including equipment specification. Hydraulic analysis of the plant. Cost analysis.
2 lects., 1 lab.(4); second term
Prerequisite: Civil Engineering 3M04 and Engineering 4U03 or permission of the instructor.

ENGINEER 4U03 UNIT OPERATIONS AND PROCESSES IN ENVIRONMENTAL ENGINEERING
Offered jointly by the Departments of Chemical Engineering and Civil Engineering and Engineering Mechanics. Fundamentals of chemical, physical and biological unit operations and processes in water and wastewater engineering. Bio-oxidation, clarification, coagulation, sludge dewatering and disinfection.
2 lects., 1 tut.(3); first term
Prerequisite:Chemical Engineering 2O04 or Civil Engineering 3M04 or Mechanical Engineering 3O04; and registration in Level IV of a B.Eng. programme or Level V of a B.Eng.Mgt. programme.

For **Graduate courses**, see *Calendar of the School of Graduate Studies.*

Classics

Faculty as of January 15, 1989

P. Kingston/*Chairman*

Professors Emeriti

Harold F. Guite/B.A., M.A. *(London)*
Thomas F. Hoey/B.A. *(Montreal)*, M.A. *(Toronto)*, Ph.D. *(Harvard)*, S.T.L., Ph.L *(Immaculate Conception Seminary, Montreal)*
Donald M. Shepherd/M.A. *(Queen's)*, Ph.D. *(Chicago)*

Professors

Katherine M. D. Dunbabin/B.A., D. Phil. *(Oxford)*
Howard Jones/B.A. *(London)*, M.A., Ph.D. *(Indiana)*
Alexander G. McKay/B.A. *(Toronto)*, M.A. *(Yale)*, A.M., Ph.D. *(Princeton)*, F.R.S.C.
George M. Paul/M.A. *(Oxford)*, Ph.D. *(London)*
William J. Slater/M.A., Ph.D. *(St. Andrews)*

Associate Professors

Peter Kingston/B.A., Ph.D. *(London)*
Paul Murgatroyd/B.A., M.A. *(Cambridge)*, Ph.D. *(London)*

Assistant Professors

Johnson B. Clinard/B.A. *(North Carolina)*, M.A. *(Columbia)*, Ph.D. *(North Carolina)*
Margaret C. Miller/B.A. *(British Columbia)*, B.A. *(Oxford)*, A.M., Ph.D. *(Harvard)*

Associate Members

Daniel J. Geagan/(History) B.A. *(Boston College)*, Ph.D. *(Johns Hopkins)*
Bryan D. Mangrum/(Art and Art History)/B.A. *(Swarthmore)*, M.F.A. *(Princeton)*

CLASSICS

Department Note:
The following courses are available as electives to qualified students in any programme:

a. *Classical Archaeology and Art History*
Classical Civilization 2A03, 2B03, 2C03, 2F03, 3G03, 3H03, 3R03, 3S03

b. *Ancient History and Society*
Classical Civilization 2G06, 2U03, 2V03, 2X03, 2Z03, 3LL3, 3MM3, 3UU3, 3VV3, 3WW3

c. *Classical Literature in Translation*
Classical Civilization 2D03, 2E03, 3C03, 3I03

d. *Greek Studies*
Greek 1Z06, 2A03, 2F03, 2G03, 2R03, 3AA3, 3BB3, 3R02, 4AA3, 4R02

e. *Latin Studies*
Latin 1Z06, 2A03, 2F03, 2G03, 2R03, 3AA3, 3BB3, 3R02, 4AA3, 4R02

CLASSICAL CIVILIZATION

No language other than English is required for courses listed under Classical Civilization.

CLAS CIV 1A06 AN INTRODUCTION TO THE CIVILIZATIONS OF GREECE AND ROME
A survey of Greek and Roman culture from the Mycenaean Age to the Late Roman Empire, based on readings from Greek and Roman authors in translation and on the archaeological evidence.
2 lects., 1 tut.; two terms
Prerequisite: Open.

CLAS CIV 2A03 INTRODUCTION TO CLASSICAL ARCHAEOLOGY
A study of the history and methodology of Greek and Roman archaeology illustrated with materials from excavated sites.
3 lects.; one term
Prerequisite: Open to students in Level II and above.

CLAS CIV 2B03 GREEK ART
The architecture, sculpture and painting of the Greek and Hellenistic world.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Same as Art History 2B03.

CLAS CIV 2C03 ROMAN ART
The architecture, sculpture, and painting of the Roman world.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Same as Art History 2C03.

CLAS CIV 2D03 GREEK AND ROMAN MYTHOLOGY
A study of the myths of Greek and Roman gods and heroes, their explanation according to theories on the nature of myths, and their use by Greek and Roman authors, particularly Homer and Vergil.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Same as Comparative Literature 2M03.

CLAS CIV 2E03 GREEK AND ROMAN DRAMA
Reading of selected Greek and Roman tragedies and comedies. Lectures about the development of the drama, presentation of plays, the authors and their works, and the influence of Classical drama on later drama.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Same as Comparative Literature 2B03 and Drama 2E03.

CLAS CIV 2F03 GREEK AND ROMAN SCIENCE AND TECHNOLOGY
A study of the achievements and the theoretical and social implications of science and technology in the Greek and Roman world. The topics surveyed include agriculture, architecture, engineering, medicine, metallurgy, power, surveying and transport.
3 lects; one term
Prerequisite: Open to students in Level II and above.
Offered in alternate years.

CLAS CIV 2G06 THE HISTORY OF GREECE AND ROME
Greece from the rise of the city-states to Alexander; Rome from the Middle Republic through the early Empire. Attention will be given to political, military and social developments in the light of both literary and archaeological evidence.
3 hrs. (lects. and discussion groups); two terms
Prerequisite: Open to students in Level II and above.
Same as History 2L06.

CLAS CIV 2U03 GREEK SOCIETY
A description and analysis of selected aspects of the social life of Greece. The topics surveyed include work and leisure, slavery, marriage and family life, the roles of women, religion, law, social structure and social mobility.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Alternates with Classical Civilization 2V03.

CLAS CIV 2V03 ROMAN SOCIETY
A description and analysis of selected aspects of the social life of Rome. The topics surveyed include work and leisure, slavery, marriage and family life, the roles of women, religion, law, social structure and social mobility.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Not offered in 1989-90. Alternates with Classical Civilization 2U03.

CLAS CIV 2X03 GREEK AND ROMAN BACKGROUND TO EARLY CHRISTIANITY
A description and analysis of selected Greek and Roman social and political institutions which helped to form the background to the life of early Christians and the New Testament writers. The topics surveyed include the spread of the Greek language and culture, Roman provincial government and the Roman army, travel by land and sea, the life of major cities, education and literature.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Alternates with Classical Civilization 2Z03.
Same as Religious Studies 2X03.

CLAS CIV 2Z03 GREEK AND ROMAN RELIGION
A study of the role of religion in Greek and Roman public and private life.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Not offered in 1989-90. Alternates with Classical Civilization 2X03.
Same as Religious Studies 2Z03.

CLAS CIV 3C03 GREEK AND ROMAN EPIC
A survey of epic poetry, including the origins, Homer and Greek epic, Vergil and Roman epic.
3 lects.; one term
Prerequisite: Classical Civilization 1A06 or 2D03; or permission of the Department.
Not offered in 1989-90. Alternates with Classical Civilization 4A03.

CLAS CIV 3G03 LATE ANTIQUE AND EARLY CHRISTIAN ART
The art and architecture of the later Roman Empire, and the birth of Christian art (A.D. 200-600).
3 lects.; one term
Prerequisite: Classical Civilization 2C03 or Art History 2G03; or permission of the Department.
Not offered in 1989-90. Alternates with Classical Civilization 3H03.
Same as Art History 3G03.

CLAS CIV 3H03 ARCHAIC GREEK ART
The formative period of Greek Art, from its rebirth after the Dark Ages to the Persian Wars (ca. 1000-480 B.C.), and its relationship to the art of the Near East.
3 lects.; one term
Prerequisite: Classical Civilization 2B03; or permission of the Department.
Alternates with Classical Civilization 3G03.
Same as Art History 3H03.

CLAS CIV 3I03 TOPICS IN GREEK AND ROMAN LITERATURE
1989-90: The Legend of the Trojan War
A study of the episodes and uses of the Trojan War legend in Greek and Roman authors and in modern literature.
3 lects.; one term
Prerequisite: Six units of Classical Civilization; or permission of the Department.
Same as Comparative Literature 3I03.
Classical Civilization 3I03 may be repeated, if on a different topic, to a total of 6 units.

CLAS CIV 3LL3 THE HELLENISTIC AGE
The successors of Alexander, the world of the monarchies and their absorption into the Roman Empire. Political, cultural and social achievements in the light of modern historical research will be emphasized.
3 hrs. (lects. and discussion groups); one term
Prerequisite: Open to students in Level II and above. Not available to students with credit in History 3L06.
Offered in alternate years.
Same as History 3LL3.

CLAS CIV 3MM3 THE ROMAN EMPIRE
Rome, Italy and the provinces from the creation of an autocracy by Augustus until the end of the 2nd century A.D.: developments in government, society, defence and economy; the Romanization of the provinces. Archaeological evidence and new approaches to problems will be considered.
3 hrs. (lects. and discussion groups); one term
Prerequisite: Six units of Classical Civilization or History 1L06; or permission of the Department. Not available to students with credit in History 3D06.
Offered in alternate years.
Same as History 3MM3.

CLAS CIV 3R03 THE ARCHAEOLOGY OF GREEK CITIES
An examination of major Greek archaeological sites, focusing on selected sanctuaries and settlements from the Bronze Age to the Hellenistic period.
3 lects.; one term
Prerequisite: One of Classical Civilization 2A03, 2B03, 2F03, 3S03; or permission of the Department. Not available to students receiving credit for Classical Civilization 2L03.
Not offered in 1989-90. Alternates with Classical Civilization 3S03.

CLAS CIV 3S03 THE ARCHAEOLOGY OF THE CITY OF ROME AND ROMAN ITALY

The growth of the city of Rome, from its origins to the triumph of Christianity, and an examination of the archaeological remains of Pompeii, Ostia and other cities of Roman Italy.

3 lects.; one term

Prerequisite: One of Classical Civilization 2A03, 2C03, 2F03, 3R03; or permission of the Department. Not available to students receiving credit for Classical Civilization 2M03.

Alternates with Classical Civilization 3R03.

CLAS CIV 3UU3 GREEK SOCIETY IN THE AGE OF PERICLES

A description and analysis of selected aspects of the social life of Athens in the second half of the 5th century B.C., based upon contemporary literature, documents and artifacts. Lectures will deal in greater depth with topics introduced in Classical Civilization 2U03, as well as others peculiar to Periclean Athens: work and leisure, education, religion, marriage and family life, the roles of women, war and peace, social structure and social mobility.

3 lects.; one term

Prerequisite: Six units of Classical Civilization courses including 2U03; or Classical Civilization 2G06; or History 1L06; or permission of the Department. Not available to students with credit in Classical Civilization 3M03.

Alternates with Classical Civilization 3VV3.

Same as History 3UU3.

CLAS CIV 3VV3 ROMAN SOCIETY IN THE AGE OF AUGUSTUS

A description and analysis of selected aspects of the social life of Rome at the end of the 1st century B.C. based upon contemporary literature, documents and artifacts. Lectures will deal in greater depth with topics introduced in Classical Civilization 2V03, as well as others peculiar to Augustan Rome: work and leisure, education, religion, marriage and family life, the roles of women, war and peace, social structure and social mobility.

3 lects.; one term

Prerequisite: Six units of Classical Civilization courses including 2V03; or Classical Civilization 2G06; or History 1L06; or permission of the Department. Not available to students with credit in Classical Civilization 4N03.

Not offered in 1989-90. Alternates with Classical Civilization 3UU3.

Same as History 3VV3.

CLAS CIV 3WW3 TOPICS IN GREEK AND ROMAN SOCIETY

3 lects.; one term

Prerequisite: Classical Civilization 2G06, or six units of Classical Civilization courses including 2U03 or 2V03.

Not offered in 1989-90. Offered in alternate years.

Same as History 3WW3.

Classical Civilization 3WW3 may be repeated, if on a different topic, to a total of 6 units.

CLAS CIV 3X03 TOPICS IN ANCIENT ART AND ARCHAEOLOGY

1989-90: Hellenistic and Roman Painting

A study of painting in the later Greek World (from ca. 350 B.C.) and subsequent developments in Italy and the Roman Empire. The evidence will be drawn principally from wall-paintings.

Seminar (2 hrs.); one term

Prerequisite: Classical Civilization 2B03 or 2C03, and registration in Level III or IV of a programme in Classical Studies, Classics or Art History; or permission of the Department of Classics.

Offered in alternate years.

Same as Art History 3X03.

Classical Civilization 3X03 may be repeated, if on a different topic, to a total of six units.

CLAS CIV 4A03 THE CLASSICS AND ENGLISH LITERATURE

A course devoted to an exploration of the influences of classical literature upon English writers from medieval to modern times.

Seminar (2 hrs.); one term

Prerequisite: Registration in Level III or IV of any programme in literature; or permission of the Department.

Alternates with Classical Civilization 3C03.

Same as Comparative Literature 4D03 and English 4A03.

CLAS CIV 4D06 SPECIAL TOPICS IN GREEK HISTORY

Investigations into Greek social history and its interpretation.

Seminar (2 hrs.); two terms

Prerequisite: Six units from Classical Civilization 1A06, 2G06, 2U03, 3LL3, 3UU3, or History 1L06, and registration in Level III or IV of any Honours programme in Classical Studies, Classics, or History; or permission of the Department of History.

Same as History 4D06.

Enrolment is limited.

CLAS CIV 4I06 SPECIAL TOPICS IN ROMAN HISTORY

The central theme will be development and change throughout the Roman Empire in the 3rd and 4th Centuries A.D.

Seminar (2 hrs.); two terms

Prerequisite: Six units from Classical Civilization 2G06, 2V03, 3MM3, 3VV3, and registration in Level III or IV of any Honours programme in Classical Studies, Classics, or History; or permission of the History Department.

Same as History 4I06.

Enrolment is limited.

CLAS CIV 4LL6 THEMES IN ANCIENT HISTORY

An examination of at least two selected themes in Ancient History, particularly the history of the Greco-Roman world, with emphasis on the use of source materials, primary and secondary, literary and non-literary.

Seminar (2 hrs.); two terms

Prerequisite: Six units from Classical Civilization 2G06, 3LL3, 3MM3, 3UU3, 3VV3 and registration in Level IV of any honours programme in Classical Studies, Classics, or History with a Cumulative Area Average of at least 9.0; or permission of the History Department.

Same as History 4LL6.

Enrolment is limited.

CLAS CIV 4X03 SUPERVISED STUDY IN GREEK AND LATIN LANGUAGE AND LITERATURE

Advanced study of themes in Greek and Latin Language and Literature supervised by a Department member. At least three short papers and a written examination are required.

Prerequisite: Registration in Level IV of any Honours programme in Classical Studies or Classics, and an average of at least 7.0 in at least 6 units of Level III and IV Greek or Level III and IV Latin, or permission of the Department.

Students may take only one of 4XX6, 4X03, 4YY6, 4Y03, 4ZZ6, 4Z03.

CLAS CIV 4XX6 THESIS IN GREEK AND LATIN LANGUAGE AND LITERATURE

Reading and research in the area of Greek and Latin Language and Literature supervised by a Department member. A major paper is required as well as a formal oral examination.

Prerequisite: Registration in Level IV of any Honours programme in Classical Studies or Classics, and an average of at least 10.0 in at least 6 units of Level III and IV Greek or Level III and IV Latin, and permission of the Department.

Students may take only one of 4XX6, 4X03, 4YY6, 4Y03, 4ZZ6, 4Z03.

CLAS CIV 4Y03 SUPERVISED STUDY IN CLASSICAL ARCHAEOLOGY AND ART HISTORY

Advanced study of themes in Classical Archaeology and Art History supervised by a Department member. At least three short papers and a written examination are required.

Prerequisite: Registration in Level IV of any Honours programme in Classical Studies or Classics, and an average of at least 7.0 in at least 6 units from Classical Civilization 3G03, 3H03, 3R03, 3S03, 3U03, or permission of the Department.

Students may take only one of 4XX6, 4X03, 4YY6, 4Y03, 4ZZ6, 4Z03.

CLAS CIV 4YY6 THESIS IN CLASSICAL ARCHAEOLOGY AND ART HISTORY

Reading and research in the area of Classical Archaeology and Art History supervised by a Department member. A major paper is required as well as a formal oral examination.

Prerequisite: Registration in Level IV of any Honours programme in Classical Studies, and an average of a least 10.0 in at least 6 units from Classical Civilization 3G03, 3H03, 3R03, 3S03, 3X03 and permission of the Department.

Students may take only one of 4XX6, 4X03, 4YY6, 4Y03, 4ZZ6, 4Z03.

CLAS CIV 4Z03 SUPERVISED STUDY IN ANCIENT HISTORY AND SOCIETY

Advanced study of themes in Ancient History and Society supervised by a Department member. At least three short papers and a written examination are required.

Prerequisite: Registration in Level IV of any Honours programme in Classical Studies, and an average of at least 7.0 in at least 6 units from Classical Civilization 3LL3, 3MM3, 3UU3, 3VV3, 3WW3 or permission of the Department.

Students may take only one of 4XX6, 4X03, 4YY6, 4Y03, 4ZZ6, 4Z03.

CLAS CIV 4ZZ6 THESIS IN ANCIENT HISTORY AND SOCIETY

Reading and research in the area of Ancient History and Society supervised by a Department member. A major paper is required as well as a formal oral examination.

Prerequisite: Registration in Level IV of any Honours programme in Classical Studies, and an average of a least 10.0 in at least 6 units from Classical Civilization 3LL3, 3MM3, 3UU3, 3VV3, 3WW3 and permission of the Department.

Students may take only one of 4XX6, 4X03, 4YY6, 4Y03, 4ZZ6, 4Z03.

RELATED CLASSICAL CIVILIZATION COURSES OFFERED BY OTHER DEPARTMENTS

Philosophy 2A06	Ancient Greek Philosophy
Philosophy 3E03	Plato
Philosophy 3J03	Aristotle
Religious Studies 2E06	Introduction to the Study of the New Testament
Religious Studies 2F03	The Spread of Christianity
Religious Studies 2II3	Christianity in the Patristic Period (100-800)
Religious Studies 3K03	Introduction to Hellenistic Judaism
Religious Studies 3003	The Fourth Gospel
Religious Studies 3X03	The Letters of Paul

GREEK

Beginner's Language Course

(Students with Grade 13 or OAC Greek should normally register in Greek 2A03, but, with special permission, may register in Greek 1Z06.)

GREEK 1Z06 BEGINNER'S INTENSIVE GREEK
A rapid introduction to the grammar of Classical Greek. Passages of simple Greek are read in the second term.
5 hrs. (lects. and tuts.); two terms
Prerequisite: Open except to graduates of Grade 13 or OAC Greek who must have special permission to register in the course.
This course, with a grade of at least B–, is accepted as a prerequisite for admission to any Honours programme in Classical Studies or Classics, or, with a grade of at least C–, for admission to the B.A. programme in Classical Studies.

Intermediate and Advanced Language and Literature Courses

GREEK 2A03 INTRODUCTION TO READING GREEK AUTHORS
A study of selected passages from Greek authors designed to develop a student's proficiency in reading Greek.
3 lects.; one term
Prerequisite: Grade 13 or OAC Greek or Greek 1Z06; or permission of the Department. Not available to students with credit in Greek 2Q03. Students using this course as a Humanities I requirement will also register for an additional 3 units of Level II Greek to be taken in Term II.

GREEK 2F03 EURIPIDES
Selected readings from the tragedies.
3 lects.; one term
Prerequisite: Greek 2A03 or 2Q03; or permission of the Department.
Not offered in 1989-90. Alternates with Greek 2G03.

GREEK 2G03 PLATO
Selected readings from the dialogues.
3 lects.; one term
Prerequisite: Greek 2A03 or 2Q03; or permission of the Department.
Alternates with Greek 2F03.

GREEK 2R03 GREEK LANGUAGE
A study of Greek grammar and style based chiefly upon reading selected passages from the works of Xenophon and translation from English to Greek.
2 lects.; two terms
Prerequisite: Greek 1Z06 with a grade of at least B– or Greek 2A03 or 2Q03; or permission of the Department.

GREEK 3AA3 HOMER
Selected readings from the *Iliad* or the *Odyssey*.
3 lects.; one term
Prerequisite: Six units of Level II Greek including Greek 2A03 or 2Q03; or permission of the Department. Not available to students with credit in Greek 4P03 (1988-89).
Not offered in 1989-90. Alternates with Greek 4AA3.

GREEK 3BB3 TOPICS IN GREEK LITERATURE
1989-90: Greek Tragedians
Selected readings from Aeschylus, Sophocles and Euripides.
3 lects.; one term
Prerequisite: Six units of Level II Greek including Greek 2A03 or 2Q03; or permission of the Department.
Greek 3BB3 may be repeated, if on a different topic, to a total of six units.

GREEK 3R02 ADVANCED GREEK LANGUAGE STUDY I
A study of Greek grammar and style, and practice in Greek composition.
1 lect.; two terms
Prerequisite: Nine units of Level II Greek including Greek 2R03; or permission of the Department.
Not offered in 1989-90. Alternates with Greek 4R02.

GREEK 4AA3 GREEK HISTORIANS
Selected readings from the *Histories* of Herodotus or the *Peloponnesian War* of Thucydides.
3 lects.; one term
Prerequisite: Six units of Level II Greek including Greek 2A03 or 2Q03; or permission of the Department. Not available to students with credit in Greek 4Q03.
Alternates with Greek 3AA3.

GREEK 4K03 GUIDED READING IN GREEK AUTHORS
Reading of selections from Greek authors supervised by a member of the Department.
Tuts.; one term
Prerequisite: Six units of Level II Greek including Greek 2A03 or 2Q03 and registration in Level III or IV of any Honours programme in Classical Studies or Classics, and permission of the Department.
Greek 4K03 may be repeated, if on a different topic, to a total of six units.

GREEK 4R02 ADVANCED GREEK LANGUAGE STUDY II
A study of Greek grammar and style, and practice in Greek composition.
1 lect.; two terms
Prerequisite: Nine units of Level II Greek including Greek 2R03; or permission of the Department.
Alternates with Greek 3R02.

LATIN

Beginner's Language Course

(Students with Grade 13 or OAC Latin should normally register in Latin 2A03, but, with special permission, may register in Latin 1Z06.)

LATIN 1Z06 BEGINNER'S INTENSIVE LATIN
An introduction to the grammar of Classical Latin. Practice in reading simple Latin passages followed by the study of selections from the speeches of Cicero.
5 hrs. (lects. and tuts.); two terms
Prerequisite: Open except to graduates of Grade 13 or OAC Latin who must have special permission to register in the course.
This course, with a grade of at least B–, is accepted as a prerequisite for admission to any Honours programme in Classical Studies or Classics, or, with a grade of at least C–, for admission to the B.A. programme in Classical Studies.

Intermediate and Advanced Language and Literature Courses

LATIN 2A03 INTRODUCTION TO READING LATIN AUTHORS
A study of selected passages from Latin authors designed to develop a student's proficiency in reading Latin.
3 lects.; one term
Prerequisite: Grade 13 or OAC Latin or Latin 1Z06; or permission of the Department. Not available to students with credit in Latin 2Q03. Students using this course as a Humanities I requirement will also register for an additional 3 units of Level II Latin to be taken in Term II.

LATIN 2F03 CATULLUS AND HORACE
Selected readings from the poems of Catullus and Horace.
3 lects.; one term
Prerequisite: Latin 2A03 or 2Q03; or permission of the Department. Not available to students with credit in Latin 2B03.
Alternates with Latin 2G03.

LATIN 2G03 VERGIL
Selected readings from the *Aeneid*.
3 lects.; one term
Prerequisite: Latin 2A03 or 2Q03; or permission of the Department.
Not offered in 1989-90. Alternates with Latin 2F03.

LATIN 2R03 LATIN LANGUAGE
A study of Latin grammar and style based chiefly upon reading selected passages from the works of Cicero and translation from English to Latin.
2 lects.; two terms
Prerequisite: Latin 1Z06 with a grade of at least B–, or Latin 2A03 or 2Q03; or permission of the Department.

LATIN 3AA3 CICERO
Selected readings from the speeches.
3 lects.; one term
Prerequisite: Six units of Level II Latin including Latin 2A03 or 2Q03; or permission of the Department. Not available to students with credit in Latin 3Q03.
Not offered in 1989-90. Alternates with Latin 4AA3.

LATIN 3BB3 TOPICS IN LATIN LITERATURE
1989-90: Menippean Satire
Readings from the *Apocolocyntosis* of Seneca and the *Satyricon* of Petronius.
3 lects.; one term
Prerequisite: Six units of Level II Latin including Latin 2A03 or 2Q03; or permission of the Department.
Latin 3BB3 may be repeated, if on a different topic, to a total of six units.

LATIN 3R02 ADVANCED LATIN LANGUAGE STUDY I
A study of Latin grammar and style, and practice in Latin composition.
1 lect.; two terms
Prerequisite: Nine units of Level II Latin including Latin 2R03; or permission of the Department.
Not offered in 1989-90. Alternates with Latin 4R02.

LATIN 4AA3 ROMAN HISTORIANS
Selected readings from the *Ab Urbe Condita* of Livy or the *Annales* of Tacitus.
3 lects; one term
Prerequisite: Six units of Level II Latin including Latin 2A03 or 2Q03; or permission of the Department. Not available to students with credit in Latin 4Q03.
Alternates with Latin 3AA3.

LATIN 4K03 GUIDED READING IN CLASSICAL LATIN AUTHORS
Reading of selections from Classical Latin authors supervised by a member of the Department.
Tuts.; one term
Prerequisite: Six units of Level II Latin including Latin 2A03 or 2Q03 and registration in Level III or IV of any Honours programme in Classical Studies or Classics and permission of the Department.
Latin 4K03 may be repeated, if on a different topic, to a total of six units.

LATIN 4KK3 GUIDED READING IN MEDIEVAL LATIN AUTHORS
Reading of selections from Medieval Latin authors supervised by a member of the Department.
Tuts.; one term
Prerequisite: Six units of Level II Latin including Latin 2A03 or 2Q03 and registration in Level III or IV of any Honours programme in Classical Studies or Classics and permission of the Department.
Latin 4KK3 may be repeated, if on a different topic, to a total of six units.

LATIN 4R02 ADVANCED LATIN LANGUAGE STUDY II
A study of Latin grammar and style, and practice in Latin composition.
1 lect.; two terms
Prerequisite: Nine units of Level II Latin including Latin 2R03; or permission of the Department.
Alternates with Latin 3R02.

For **Graduate Courses** see *Calendar of School of Graduate Studies*.

Commerce

Faculty as of January 15, 1989

Peter M. Banting/Chairman, Marketing Area

Itzhak Krinsky/Chairman, Finance and Business Economics Area

Bernadette E. Lynn/Acting Chairman, Accounting Area

Joseph B. Rose/Chairman, Human Resources and Labour Relations Area

George O. Wesolowsky/Chairman, Management Science and Information Systems Area

Professors Emeriti

Robert C. Joyner/B.A., M.A., Ph.D. *(Toronto)*/Organizational Behaviour
William J. Schlatter/A.B., A.M., Ph.D. *(Illinois)*, C.P.A./Accounting
Andrew Z. Szendrovits/M.A., Ph.D. *(Kolozsvar)*/Production and Management Science/Professor (Part-time) of Production and Management Science

Professors

Roy J. Adams/B.A. *(Pennsylvania State)*, M.A., Ph.D. *(Wisconsin)*/Industrial Relations
Naresh C. Agarwal/B.A., M.A. *(Delhi)*, Ph.D. *(Minnesota)*/Human Resources/Associate Dean (Academic)
Peter M. Banting/B.A., M.B.A. *(McMaster)*, Ph.D. *(Michigan State)*/Marketing/Chairman of the Marketing Area
Jeffrey L. Callen, B.A. *(York)*, M.B.A., Ph.D. *(Toronto)*/Accounting and Finance (Part-time)
M.W. Luke Chan/B.Sc. *(Prince Edward Island)*, M.A., Ph.D. *(McMaster)*/Finance and Business Economics/Associate Dean (External Relations)
Robert G. Cooper/B.Eng., M.Eng. *(McGill)*, M.B.A., Ph.D. *(Western Ontario)*/Marketing
Haim Falk/B.Ac. *(Hebrew)*, M.B.A. *(Tel-Aviv)*, Ph.D. *(Hebrew)*, C.P.A./Accounting/Professorial Chair in Accounting
Harish C. Jain/B.Com. *(Delhi)*, M.B.A. *(Indiana)*, Ph.D. *(Wisconsin)*/Human Resources and Labour Relations
Robert F. Love/B.A.Sc. *(Toronto)*, M.B.A. *(Western Ontario)*, Ph.D. *(Stanford)*, P.Eng./Management Science
Winston H. Mahatoo/B.A. *(London)*, B.Sc., M.Sc. *(McGill)*, Ph.D. *(Montreal)*/Marketing
Joseph B. Rose/B.B.A. *(Adelphi)*, M.B.A. *(California)*, Ph.D. *(State University of New York at Buffalo)*/Industrial Relations/Chairman of the Human Resources and Labour Relations Area
Randolph E. Ross/B.A. *(Waterloo Lutheran)*, M.B.A. *(Michigan State)*, D.B.A. *(Indiana)*/Marketing
George W. Torrance/B.A.Sc., M.B.A. *(Toronto)*, Ph.D. *(State University of New York at Buffalo)*, P.Eng./Management Science/Dean of the Faculty
William G. Truscott/B.S.E. *(Princeton)*, M.B.A. *(McMaster)*, D.B.A. *(Indiana)*, P.Eng./Production and Management Science/Associate Dean, School of Graduate Studies
George O. Wesolowsky/B.A.Sc. *(Toronto)*, M.B.A. *(Western Ontario)*, Ph.D. *(Wisconsin)*/Management Science/Chairman of the Management Science and Information Systems Area

Associate Professors

Prakash L. Abad/B.Tech. *(Indian Institute of Technology)*, M.S., M.B.A., Ph.D. *(Cincinnati)*/Management Science
Norman P. Archer/B.Sc. *(Alberta)*, Ph.D. *(McMaster)*, M.S. *(New York)*/Management Science
Christopher K. Bart/B.A., M.B.A. *(York)*, Ph.D. *(Western Ontario)*, C.A./Business Policy
Min S. Basadur/B.A.Sc. *(Toronto)*, M.B.A. *(Xavier)*, Ph.D. *(Cincinnati)*, P.Eng./Organizational Behaviour
Kenneth R. Deal/B.S., M.B.A., Ph.D. *(State University of New York at Buffalo)*/Marketing and Management Science
James C. Gaa/B.A. *(Michigan State)*, A.M., Ph.D. *(Washington, St. Louis)*, Ph.D. *(Illinois)*/Accounting
Elko J. Kleinschmidt/Dip.Ing. *(Staatliche Ingenieurschule, Hannover)*, M.B.A., Ph.D. *(McGill)*/Marketing and International Business
Itzhak Krinsky/B.A., M.A. *(Tel Aviv)*, Ph.D. *(McMaster)*/Finance and Business Economics/Chairman of the Finance and Business Economics Area
Clarence C.Y. Kwan/Ph.D. *(Ottawa)*, M.B.A. *(McMaster)*, Ph.D. *(Toronto)*, P.Eng./Finance
John G. Miltenburg/B.Eng.Mgt., M.B.A. *(McMaster)*, M.Eng. *(Toronto)*, Ph.D. *(Waterloo)*, P.Eng./Production and Management Science
Dean C. Mountain/B.A. *(McMaster)*, M.A., Ph.D. *(Western Ontario)*/Finance and Business Economics
Thomas E. Muller/M.B.A. *(Simon Fraser)*, Ph.D. *(British Columbia)*/Marketing
Mahmut Parlar/B.Sc., M.Sc. *(Middle East Technical University)*, Ph.D. *(Waterloo)*/Management Science/Co-ordinator, Ph.D. Programme (Management Science/Systems)
Gordon D. Richardson/B.A. *(Toronto)*, M.B.A. *(York)*, Ph.D. *(Cornell)*, C.A./Accounting
Anne G. Samdal/B.S. *(Auburn)*, Ph.D. *(North Carolina)*/Business Economics (Part-time)
George Steiner/M.Sc. *(Budapest)*, Ph.D. *(Waterloo)*/Production and Management Science

Assistant Professors

Trevor W. Chamberlain/B.Sc. *(California, Berkeley)*, M.B.A. *(McGill)*, Ph.D. *(Toronto)*, C.A./Finance
Y.C. Lilian Chan/B.B.A. *(Chinese University of Hong Kong)*, Ph.D. *(Virginia Polytechnic Institute and State University)*/Accounting
C.S. Sherman Cheung/B.S. *(Louisiana State)*, M.S., Ph.D. *(Illinois)*/Finance and Business Economics
Richard W. Deaves/B.A., M.A., Ph.D. *(Toronto)*/Finance and Business Economics
Rick D. Hackett/B.Sc. *(Toronto)*, M.A. *(Windsor)*, Ph.D. *(Bowling Green State)*/Human Resources
Hwan Kim/B.S., M.S. *(Illinois)*/Accounting
Yongho Lee, B.A. *(Seoul National)*, M.B.A. *(Santa Clara)*/Finance
Bernadette E. Lynn/B.A. *(Carlow College)*, M.A. *(Pittsburgh)*, Ph.D., M.B.A. *(McMaster)*, C.M.A./Accounting/Acting Chairman of the Accounting Area
John W. Medcof/B.A. *(New Brunswick)*, M.A. *(Toronto)*, Ph.D. *(Toronto)*/Organizational Behaviour
Ali R. Montazemi/H.N.D. *(Teesside Polytechnic, U.K.)*, M.Sc. *(Southampton)*, Ph.D. *(Waterloo)*/Information Systems
S.M. Khalid Nainar, B.A., M.A. *(Delhi)*/Accounting
Wendy D. Rotenberg/ B.A., M.B.A., Ph.D. *(Toronto)*/Finance
Mohamed M. Shehata/B.Com. *(Tanta)*, M.S. *(Ain-Shams)*, M.B.A. *(North Texas State)*, Ph.D. *(Florida)*/Accounting
Mannsoo Shin/B.B.A. *(Korea)*, M.B.A. *(Hawaii at Manoa)*/International Business
D. Wayne Taylor/B.A. *(Toronto)*, M.P.A., Ph.D. *(York)*, P.Admin, P.Mgr./Business and Public Policy
Yufei Yuan/B.S. *(Fudan)*, Ph.D. *(Michigan)*/Information Systems
F. Isik Zeytinoglu/B.A., M.A., *(Bogazici)*, M.S., Ph.D. *(Pennsylvania)*/Industrial Relations

Lecturers

Christopher C. Costanza/B.Com., M.B.A. *(McMaster)*, C.A./Accounting (Half-time)
Elizabeth A. Csordas/B.Sc. *(Windsor)*, M.B.A. *(McMaster)*, C.M.A./Accounting/M.B.A. Student Advisor
Joan L. Fahie/B.Sc., M.B.A. *(McMaster)*/Management Science
Susan H. Glass/M.B.A. *(McMaster)*/Accounting
Nicholas A. Mastroluisi/B.Sc. *(Western Ontario)*, M.B.A. *(McMaster)*, C.A./Taxation (Half-time)
Ross J. McKeown, B.Sc. *(Sir George Williams)*, M.B.A. *(Queen's)*/Marketing and International Business
Marvin G. Ryder/B.A., B.Sc. *(Carleton)*, M.B.A. *(McMaster)*/Marketing and Business Policy/Assistant to the Dean *(Computing)*
David Sparling, B.Sc. *(Queen's)*, M.B.A. *(Wilfrid Laurier)*/Management Science
Paul M. Stillman/B.Sc. *(McMaster)*, LL.B. *(Osgoode Hall)*/Business Law (Half-time)

Faculty Notes:

1. **Commerce courses are open only to students registered in Commerce or the Engineering and Management programme, and to students registered in degree programmes in Labour Studies when such courses are specified as part of the programme. Students who are not eligible for Commerce courses should refer to the Business course listings.**

2. Normally, Level II and Level III Commerce courses are scheduled for *3 lects.; one term*, while Level IV Commerce courses are *2 lects.; one term*. Courses offered in evenings are *1 lect.; one term*.
3. In most Level IV Commerce courses, section size will be restricted to a maximum of 30 students; students will be admitted on a first-come basis.

COMMERCE 2AA3 FINANCIAL ACCOUNTING I
An introduction to the basic principles and practices of financial accounting. Examination of income measurement and asset and liability valuation to provide an understanding of financial accounting information.
Prerequisite: Economics 1A06.

COMMERCE 2BA3 ORGANIZATIONAL BEHAVIOUR
An introduction to the analysis of behaviour in the administration of organized enterprises. The consequences of the organization's goals, technology, structure, environment and managerial styles are examined. Applications are made of studies of perception, problem solving, communication and group processes to the leadership, design and development of organizations.

COMMERCE 2FA3 FINANCIAL INSTRUMENTS AND INSTITUTIONS
An introduction to both micro and macro aspects of Finance. At the micro level, some of the basic concepts and elementary theories in Finance will be explored in order to provide an understanding of investment and financing decisions. At the macro level, various financial instruments and functions of financial institutions in Canada will be described.
Prerequisite: Economics 1A06 and Commerce 2AA3.

COMMERCE 2MA3 INTRODUCTION TO MARKETING
An introduction to marketing as a field of study, market structure, marketing institutions, marketing concepts and strategies. Stress is placed upon the analytical, managerial, and conceptual aspects of the subject.
Prerequisite: Economics 1A06.

COMMERCE 2QA3 COMPUTER-AUGMENTED STATISTICAL ANALYSIS
An introduction to the application of statistical analysis in managerial decision-making. The concepts of statistical analysis are applied to a variety of topics, including decision-making, estimation by sampling, hypothesis testing, analysis of variance, simple linear and multiple regression and forecasting.
Prerequisite: Mathematics 1L03, and one of Mathematic 1M03 or 1A06, and one of Computer Science 1A03 or 1BA3.

COMMERCE 3AA3 COST AND MANAGERIAL ACCOUNTING I
An introduction to concepts underlying the use of cost accounting information for managerial planning and control, and for inventory valuation. The nature and analysis of costs, and the usefulness and limitations of accounting data for decision-making will be discussed.
Prerequisite: Commerce 2AA3.

COMMERCE 3AB3 FINANCIAL ACCOUNTING II
A first course in intermediate financial accounting dealing with the theory and practice of financial statement preparation and reporting. The emphasis will be on asset valuation and the related impact on income measurement.
Prerequisite: Commerce 2AA3.

COMMERCE 3BA3 INDUSTRIAL RELATIONS
An introduction to the structure and process whereby labour, management and the public interact to produce terms and conditions of employment. Topics include the development, structure and objectives of organized labour, management philosophy and policy in industrial relations and governmental policy.
Prerequisite: Commerce 2BA3.

COMMERCE 3BB3 PERSONNEL
An introduction to the administrative and research aspects of the selection, placement, remuneration, training, and promotion of people in organizations.
Prerequisite: Commerce 2BA3.

COMMERCE 3FA3 INTRODUCTION TO MANAGERIAL FINANCE
An examination of the nature and administration of the finance function. The emphasis is on the development of basic concepts pertaining to the investment problem in asset management, and the financing problem in short and long-range sources of funds, capital structure, and dividend policy.
Prerequisite: Commerce 2FA3.

COMMERCE 3FB3 SECURITIES ANALYSIS
The emphasis is on the analysis of marketable securities, especially equities. Topics include: the mechanics of the secondary markets, the investment characteristics of securities, investment strategies to improve rates of return, and the techniques of securities analysis and valuation. In addition, the course introduces portfolio considerations and the 'efficient markets' literature.
Prerequisite: Commerce 2FA3.

COMMERCE 3MA3 INTRODUCTION TO MARKETING RESEARCH
An introduction to the role and methods of marketing research. Among topics considered are measurement, sample selection, questionnaire development, data collection, and analysis and interpretation of data.
Prerequisite: Commerce 2MA3, and 2QA3 or Statistics 3Y02 or 3Y03.

COMMERCE 3MB3 CONSUMER MOTIVATION
An analysis of the motivations underlying consumer choice behaviour such as store patronage, brand loyalty, and new-product adoption. Specifically, the course will trace the role of perception, learning, attitudes, personality, reference groups, social class and culture in the consumer decision process.
Prerequisite: Commerce 2MA3.

COMMERCE 3QA3 DECISION SCIENCE FOR MANAGERS
This course is a study of analytical approaches that assist managerial decision-making; it provides coverage of decision theory and an introduction to optimization methods, computer simulation and the general approach of management science.
Prerequisite: Commerce 2QA3.

COMMERCE 3QB3 BUSINESS DATA PROCESSING
An introduction to commercial data processing technology: I/O devices; storage; processors; software; its deployment in transaction/file processing and reporting systems; and the analysis and design of such systems.
Prerequisite: Computer Science 1A03 or 1BA3, and/or registration in a Commerce or an Engineering and Management programme.

LEVEL IV COMMERCE COURSES

In most Level IV Commerce courses, section size will be restricted to a maximum of 30 students; students will be admitted on a first-come basis.

COMMERCE 4AA3 COST AND MANAGERIAL ACCOUNTING II
A consideration of more complex topics in management planning and control including cost allocations, performance evaluation, analysis and investigation of variances, cost behaviour determination, and income measurement for management.
Prerequisite: Commerce 3AA3.

COMMERCE 4AB3 FINANCIAL ACCOUNTING III
This course completes the coverage of intermediate financial accounting. It deals with problems related to the measurement of liabilities, accounting for income taxes and corporate equities.
Prerequisite: Commerce 3AB3.

COMMERCE 4AC3 FINANCIAL ACCOUNTING IV
An advanced accounting course considering specific problems of accounting for the corporate entity, such as, business combinations, intercorporate investments, consolidated financial statements, accounting for foreign operations and foreign currency transactions, segment reporting. .
Prerequisite: Commerce 4AB3.

COMMERCE 4AD3 AUDITING
An examination of the attest function in accounting including ethical, legal, and statutory influences in the development of auditing standards. The nature of control structures and of audit evidence is examined. The nature, scope, and application of auditing procedures are examined through a selective analysis of asset, liability, revenue, and expense items.
Prerequisite: Commerce 3AB3.

COMMERCE 4AE3 ACCOUNTING INFORMATION SYSTEMS
Consideration of the principles underlying the role of accounting as an information system for planning and controlling business operations. The emphasis is on internal control in both manual and automated systems. Topics include controls over the system development process, the auditor's use and analysis of internal control, and the role of the accountant in controlling an accounting information system.
Prerequisite: Commerce 3AA3, 3AB3 and 3QB3.

COMMERCE 4AF3 SEMINAR IN ACCOUNTING THEORY
A review of accounting theory as a background for applying underlying concepts to current accounting problems. Emphasis is on current literature, with a major term paper required.
Prerequisite: Completion of, or concurrent registration in, Commerce 4AB3.

COMMERCE 4BA3 BEHAVIOURAL ISSUES IN MANAGEMENT
Detailed analysis of employee motivation and reward systems; organizational structure; leadership and decision-making; group processes; and management of conflict and change.

COMMERCE 4BB3 PERSONNEL SELECTION
This course considers the strategies and problems in personnel decisions in the context of the Canadian environment. Topics include job analysis and manpower planning, methods of personnel recruitment and selection, human rights legislation in Canada and the U.S., the practice of recruitment and selection in Canada, decision-making strategies in personnel recruitment and selection, and assessment centres.
Prerequisite: Commerce 3BB3.

COMMERCE 4BC3 COLLECTIVE BARGAINING
A survey of the nature, determinants, and impact of collective bargaining in Canada. Both the procedural and substantive aspects of collective bargaining will be studied.
Prerequisite: Commerce 3BA3, or Labour Studies 2A03 or 2A06.

COMMERCE 4BD3 SETTLEMENT OF INDUSTRIAL DISPUTES
The nature and the role of industrial conflict as well as the techniques which have been developed to control the incidence of conflict in union-management situations.
Prerequisite: Commerce 3BA3, or Labour Studies 2A03 or 2A06.

COMMERCE 4BE3 COMPENSATION THEORY AND ADMINISTRATION
The course is designed to provide an understanding of the process, issues, and techniques involved in developing effective compensation systems in organizations. The course draws heavily on economic and behavioural theories and their application to the area of compensation.
Prerequisite: Commerce 3BB3.

COMMERCE 4FA3 MANAGERIAL FINANCE
A managerial point of view is established by the application of basic financial theory and analysis to actual case situations. Lectures are used to complement case discussions. The course is useful for students interested in general management, as well as for those wishing to attain a degree of specialization in Finance.
Prerequisite: Commerce 3FA3.

COMMERCE 4FB3 FINANCIAL THEORY
This course explores the theoretical and conceptual foundations of Finance. Topics include: utility maximization and choices involving risk; the quantification of risk and return, concepts of value; the investment, financing and dividend decisions of firms; asset pricing in perfect and imperfect markets.
Prerequisite: Commerce 3FA3.

COMMERCE 4FC3 PORTFOLIO THEORY AND MANAGEMENT
The selection and management of investment portfolios is analyzed with mathematical models. The course covers recent developments in portfolio theory, with a view to applications by individual and institutional investors.
Prerequisite: Commerce 3FA3.

COMMERCE 4MC3 PRODUCT MARKETING
This course covers concepts, methods and strategies for both new and existing products. Topics include: the new product process; launch strategies; product policy; portfolio analysis and product positioning.
Prerequisite: Commerce 3MA3

COMMERCE 4MD3 INDUSTRIAL MARKETING
To give the student an overall view of the marketing of industrial goods and services, this course utilizes techniques and concepts from introductory marketing courses and applies them to the special problems encountered in the industrial market.
Prerequisite: Commerce 3MA3

COMMERCE 4PA3 BUSINESS POLICY: STRATEGIC MANAGEMENT
This case course focuses primarily upon the concept of corporate strategy formulation and implementation by exploring the functions and nature of general management and the role of the CEO within an organization. The course integrates and builds upon the learning experiences of previous functional area courses within a broader strategic analysis framework.
Prerequisite: Registration in fourth year of a Commerce programme or fifth year of an Engineering and Management programme.

COMMERCE 4PB3 TAXATION
The principles of Canadian federal income taxation are examined in considerable detail through a reading of both the statute law and the common law. Emphasis is placed on the application of the law to the situations of individuals and businesses. Topics include: administration, liability for income tax, computation of income, computation of taxable income and computation of tax.
Prerequisite: Commerce 3AB3 and 3FA3.

COMMERCE 4PC3 ADVANCED CANADIAN INCOME TAXATION
This course continues the study of Canadian federal income taxation with an in-depth coverage of selected provisions of the Income Tax Act pertaining to business activities, particularly the activities of corporations.
Prerequisite: Commerce 4PB3.

COMMERCE 4PD3 COMMERCIAL LAW
This course emphasizes those areas of law which are most relevant to business activity. Particular attention is given to the law relating to contracts and business organizations. Other areas of study include sources of law, the judicial process, real and personal property, torts, agency, credit and negotiable instruments.

COMMERCE 4PE3 INTERNATIONAL BUSINESS
A survey of theories, concepts, and corporate strategies relevant to the actual conditions and problems of international investment, trade, finance, and other related areas. Topics include balance of payments, foreign exchange, political risk, joint venture, global strategy, international personnel, and international development.
Prerequisite: Not open to students who have received credit for Commerce 4MB3.

COMMERCE 4QA3 PRODUCTION/OPERATIONS
An introduction to the production/operations function with emphasis on the use of quantitative analysis to assist decision-making. Topics include: layout of facilities, aggregate planning, scheduling, inventory control and quality control.
Prerequisite: Commerce 3QA3, or registration in an Engineering and Management programme. Not open to students registered in or with credit for Mechanical Engineering 4C03.

COMMERCE 4QB3 ANALYSIS OF PRODUCTION/OPERATIONS PROBLEMS
An examination of analytical approaches to problems in the field of production/operations. The course will provide in-depth coverage of a limited number of topics. These topics may be selected from among: layout and location of facilities, scheduling, inventory control and materials handling.
Prerequisite: Commerce 4QA3, or Mechanical Engineering 4C03.

COMMERCE 4QC3 QUANTITATIVE ANALYSIS FOR BUSINESS
An examination of the techniques of management science and their application to business problems. Topics include: linear programming, integer programming, and optimization problems on networks.
Prerequisite: Commerce 3QA3, or registration in an Engineering and Management programme.

Comparative Literature

Comparative Literature courses are administered within the Department of Modern Languages of the Faculty of Humanities.

N. Kolesnikoff (Modern Languages)/*Co-ordinator*, Togo Salmon Hall, Room 620.

Department Notes:

1. Comparative Literature is the study of literature from the point of view of more than one national literature and/or in conjunction with any other intellectual discipline. It is designed to meet the needs of those students who wish to study literary texts as an intercultural and often interdisciplinary phenomenon.
2. Courses are organized to cover six basic areas of comparative literary study:
   Literary and Cultural History
   Comparative Literature 1A06, 2D03, 2G03, 2M03, 4D03
   Literary Forms
   Comparative Literature 2B03, 3D03, 3DD3, 3E03
   Cultural Periods
   Comparative Literature 2A03, 2AA3, 3B06, 3I03, 3J03
   Literary Theory
   Comparative Literature 3Q03, 3QQ3, 4A03, 4B03
   Literature and Other Disciplines
   Comparative Literature 4C03, 4H03
   General
   Comparative Literature 4E03
3. Students enrolled in the Humanities Interdisciplinary B.A. programme may elect Comparative Literature as a theme of study. (See the *Faculty of Humanities, Interdisciplinary B.A.* section of this Calendar for details.)
4. With the approval of the Programmme Co-ordinator and of the Associate Dean of Humanities (Studies), Level III of this programme may be replaced by courses of study at a university or universities where one or more of the student's modern languages is spoken.

COMP LIT 1A06 INTRODUCTION TO THE WESTERN LITERARY TRADITION
An introduction to the origins and continuity of the Western literary tradition from the Bible and classical literature to modern literature, as seen in representative texts (in English translation). Attention is given to the development of critical skills in reading and writing.
2 lects., 1 tut.; two terms
Prerequisite: Grade 13 or OAC English; or the permission of the Co-ordinator.

COMP LIT 2A03 STUDIES IN LITERARY MOVEMENTS I
A study of the central themes and ideas shaping the Enlightenment and Romanticism through the reading of representative works (in English translation).
3 lects.; one term
Prerequisite: Comparative Literature 1A06; or permission of the Co-ordinator.

COMP LIT 2AA3 STUDIES IN LITERARY MOVEMENTS II
A study of the central themes and forms of major literary movements from Romanticism to Postmodernism through the reading of representative works (in English translation).
3 lects.; one term
Prerequisite: Comparative Literature 1A06; or permission of the Co-ordinator.

COMP LIT 2B03 GREEK AND ROMAN DRAMA
Reading of selected Greek and Roman tragedies and comedies. Lectures about the development of the drama, presentation of plays, the authors and their works, and the influence of classical drama on later drama.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Same as Classical Civilization 2E03 and Drama 2E03.

COMP LIT 2D03 BIBLICAL TRADITIONS IN LITERATURE
A study of the influence of the Bible on Western literatures, especially English. Approaches may include the examination of symbolism, imagery, typology, doctrinal themes and narrative structures.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Same as English 2D03.

COMPARATIVE LITERATURE

COMP LIT 2G03 BIBLICAL LITERATURE

A survey introduction to biblical literature (Old Testament, New Testament and selected Apocrypha and Pseudepigraphica) and the history of biblical interpretation to meet the particular needs of students of Western literature.

2 lects., 1 tut.; one term

Prerequisite: Open to students in Level II and above.

Same as Religious Studies 2VV3.

COMP LIT 2M03 GREEK AND ROMAN MYTHOLOGY

A study of the myths of Greek and Roman gods and heroes, their explanation according to theories on the nature of myths and their use by Greek and Roman authors particularly Homer and Vergil.

3 lects.; one term

Prerequisite: Open to students in Level II and above.

Same as Classical Civilization 2D03.

COMP LIT 3B06 FROM ROMANTICISM TO MODERNISM

An introduction to the major intellectual and aesthetic currents in Europe from the beginning of the nineteenth century to approximately 1920.

3 lects.; two terms

Prerequisite: Registration in Level III or IV of any programme in the Faculty of Humanities.

Same as Humanities 3B06.

COMP LIT 3CC3 MODERN EUROPEAN DRAMA FROM BRECHT TO THE PRESENT

A study of representative plays by ten major dramatists, including Garcia Lorca, Cocteau, Frisch, Sartre, Weiss, Genet, Dario Fo.

Seminar (2 hrs.), plus playreadings; one term

Prerequisite: Drama 1A06, or permission of the instructor.

Alternates with Comparative Literature 3E03.

Same as Drama 3CC3.

COMP LIT 3D03 TOPICS IN LITERARY GENRES

1989-90: The Novel

A study of the novel's form and development from 1700 to 1860. Texts are studied in relation to the historical, social and cultural contexts as well as from the point of view of form.

Seminar (2 hrs.); one term

Prerequisite: Registration in Level III or IV of a Comparative Literature programme; or permission of the Co-ordinator. Not available to students with credit in Comparative Literature 2C06.

Comparative Literature 3D03 may be repeated, if on a different topic, to a total of 6 units.

COMP LIT 3DD3 TOPICS IN THE STUDY OF LONGER LITERARY FORMS

1989-90: The Novel

A study of the development of longer fictional forms from 1860 to the present. Texts are studied in relation to their historical, social and cultural contexts as well as from the point of view of form.

Seminar (2 hrs.); one term

Prerequisite: Registration in Level III or IV of a Comparative Literature programme; or permission of the Co-ordinator. Not available to students with credit in Comparative Literature 2C06.

Comparative Literature 3DD3 may be repeated, if on a different topic, to a total of 6 units.

COMP LIT 3E03 MODERN EUROPEAN DRAMA FROM IBSEN TO PIRANDELLO

A study of representative plays by eight major dramatists, including Strindberg, Chekhov, Gorki, Wedekind and Kaiser, in English translation.

Seminar (2 hrs.), plus playreadings; one term

Prerequisite: Drama 1A06; or permission of the instructor.

Offered in 1989-90. Alternates with Commparative Literature 3CC3.

Same as Drama 3C03.

COMP LIT 3I03 TOPICS IN GREEK AND ROMAN LITERATURE

1989-90: Greek and Roman Elegiac and Lyric Poetry

An examination of the subject matter, techniques and development of Greek and Roman elegy and lyric.

3 lects.; one term

Prerequisite: Six units of Classical Civilization; or permission of the Department of Classics.

Same as Classical Civilization 3I03.

Comparative Literature 3I03 may be repeated, if on a different topic, to a total of 6 units.

COMP LIT 3J03 STUDIES IN 16TH-CENTURY LITERATURE

A study of the prose and poetry of the first phase of the English Renaissance with some emphasis on the work of More and Sidney, and subsidiary reading of continental writers influential in England such as Petrarch, Pico, Erasmus, Castiglione, Machiavelli and Montaigne.

3 lects.; one term

Prerequisite: Registration in Level III or IV of a Comparative Literature programme.

Same as English 3I03.

COMP LIT 3Q03 THE HISTORY AND THEORY OF CRITICISM

A survey of the main developments in the theory and practice of literary criticism from Plato to the early 20th century.

3 lects.; one term

Prerequisite: Registration in Level III or IV of a Comparative Literature programme.

Same as English 3Q03.

COMP LIT 3QQ3 MODERN CRITICAL THEORY

The theory and practice of literary criticism from Eliot to the present.

3 lects.; one term

Prerequisite: Registration in Level III or IV of a Comparative Literature programme.

Same as English 3QQ3.

COMP LIT 4A03 THE METHODOLOGY OF COMPARATIVE LITERATURE

A study of the range of theories of general and comparative literature.

Seminar (2 hrs.); one term

Prerequisite: Registration in Level III or IV of a Comparative Literature programme; or permission of the Co-ordinator.

Not offered in 1989-90.

COMP LIT 4B03 TOPICS IN LITERARY METHODOLOGY

1989-90: Feminist Theory

A study of Anglo-American and French feminist theories and their relevance to literature.

Seminar (2 hrs.); one term

Prerequisite: Registration in Level III or IV of a Comparative Literature programme; or permission of the Co-ordinator.

Comparative Literature 4B03 may be repeated, if on a different topic, to a total of six units.

COMP LIT 4C03 LITERATURE AND OTHER DISCIPLINES

A study of interrelations between literature and other arts and disciplines.

Seminar (2 hrs.); one term

Prerequisite: Registration in Level III or IV of a Comparative Literature programme; or permission of the Co-ordinator.

Not offered in 1989-90.

Comparative Literature 4C03 may be repeated, if on a different topic, to a total of 6 units.

COMP LIT 4D03 THE CLASSICS AND ENGLISH LITERATURE

A course devoted to an exploration of the influences of classical literature upon English writers from medieval to modern times.

1 lect., 1 seminar (2 hrs.); one term

Prerequisite: Registration in Level III or IV of any programme in literature; or permission of the Department of English.

Offered in alternate years.

Same as Classical Civilization 4A03 and English 4A03.

COMP LIT 4E03 TOPICS IN COMPARATIVE LITERATURE

1989-90: Utopia in European Literature

A study of the origin and development of the utopian genre in England, Italy, France, Germany and Spain in the XVI and XVII centuries, as well as of the influence of the chroniclers of America upon the genre.

3 lects.; one term

Prerequisite: Registration in Level III or IV of a Comparative Literature programme; or permission of the Co-ordinator.

Offered in alternate years.

Comparative Literature 4E03 may be repeated, if on a different topic, to a total of 6 units.

COMP LIT 4H03 LITERATURE AND FILM

An examination of the particular characteristics of both literature and film and the inter-relationships between them through a detailed study of selected novels, short stories and plays and the films that have been based on them.

3 lects., plus one weekly film screening; one term

Prerequisite: Registration in Level III or IV of a programme in Drama or Literature; or permission of the instructor or the Drama Chairman. It is recommended that students should already have taken Drama 2X06.

Same as English 4H03 and Drama 4H03 and Art History 4HH3.

OTHER COURSES RELEVANT TO COMPARATIVE LITERATURE

Classical Civ. 2X03	Greek and Roman Background to Early Christianity
Classical Civ. 3C03	Greek and Roman Epic
Drama 1A06	Introduction to Drama
Drama 2X06	The Art of the Film
Drama 3R03	American Cinema I
Drama 3RR3	American Cinema II
Drama 3Y03	The French Cinema
English 2C03	Contemporary Canadian Fiction
English 3B03	Psychoanalytic Approaches to Literary Texts
English 3JJ3	Topics in Fiction II
English 3KK3	Topics in Critical Approaches
English 3XX3	Topics in 20th-Century Literature II
English 3Z03	Contemporary Canadian Poetry
English 4D03	Topics in Medieval and Renaissance Literature
French 3Z03	African and Caribbean French Literature
French 4LL3	Topics in French African and Caribbean Literature
French 4R03	Studies in Medieval French Literature
French 4X03	Linguistics and Modern French Literary Criticism (from Structuralism to Semiotics)
Philosophy 2H03	Aesthetics

Religious Studies 2DD3	The Five Books of Moses
Religious Studies 2E06	Introduction to the Study of the New Testament
Religious Studies 2EE3	The Prophets
Religious Studies 2II3	Christianity in the Patristic Period, 100-800
Religious Studies 2JJ3	Christianity in the Medieval Period (800-1500)
Religious Studies 2KK3	Christianity in the 16th Century
Religious Studies 2LL3	Christianity after 1600
Religious Studies 3M03	Israelite Poetry and Wisdom
Russian 2A06	19th-Century Russian Literature in Translation
Russian 3D03	Russian Drama Since 1800
Russian 3K06	20th-Century Russian Literature in Translation

Computer Engineering

(See *Electrical and Computer Engineering*)

Computer Science and Systems

Faculty as of January 15, 1989

Gerald L. Keech/*Chairman*

Professors

Gerald L. Keech/ B.A.Sc. *(Toronto)*, M.Sc., Ph.D. *(McMaster)*
Peter E. Lauer/B.A. *(Alabama)*, M.A. *(Emory)*, Ph.D. *(Queen's, Belfast)*
Patrick J. Ryan/ B.Sc. *(Toronto)*, Ph.D. *(Brown)*

Associate Professors

Ivan Bruha/Dipl. Ing. *(CVUT, Prague)*, RNDr *(Charles, Prague)*, Ph.D. *(CVUT, Prague)*
Robin E. Griffin/B.Sc., Ph.D. *(McMaster)*/part-time
Ryszard Janicki/M.Sc. (*Warsaw*), Ph.D., D.Hab. Polish Academy of Sciences
Derek J. Kenworthy/B.A., M.A., D.Phil. *(Oxford)*
Kenneth A. Redish/B.Sc. *(London)*, F.B.C.S.
William F. Smyth/B.A. *(Toronto)*, M.Sc. *(Ottawa)*, F.B.C.S.
Nicholas Solntseff/B.Sc., Ph.D. *(Sydney)*, F.B.C.S.

Assistant Professors

Frantisek Franek/M.Sc., RNDr (*Charles, Prague*), Ph.D. (*Toronto*)
Stanislaw Jarzabek/M.Sc., Ph.D. *(Warsaw)*
W.F. Skipper Poehlman/B.S. *(Niagara)*, B.Sc. *(Brock)*, M.Sc., Ph.D. *(McMaster)*

Lecturers

Anthony Hurst/B.L.A. *(Guelph)*, M.Sc. *(McMaster)*

Associate Members

Norman P. Archer/ (Business) B.Sc. *(Alberta)*, M.S. *(New York)*, Ph.D. *(McMaster)*
Hoda A. ElMaraghy/ (Mechanical Engineering) B.Sc. (*Cairo*), M.Eng., Ph.D. (*McMaster*), P.Eng.
William J. Garland/ (Engineering Physics) M.Eng., Ph.D. *(McMaster)*, P.Eng.
Ali R. Montazemi/ (Business) H.N.D. (*Teeside Polytechnic, U.K.*), M.Sc. (*Southampton*), Ph.D. (*Waterloo*)
Alexander Rosa/M.S. *(Kiev)*, Ph.D. *(Slovak Acad. Sciences)*
David P. Santry/ B.Sc., Ph.D. *(London)*
George Steiner/Ph.D. *(Waterloo)*

Department Notes:

1. Because of resource limitations, enrolment in Computer Science and all joint programmes involving Computer Science **may be limited**. Students intending to enter any Computer Science programme should consult the Department of Computer Science and Systems.
2. The following are suggested Computer Science **options for students not** in Computer Science Programmes:

   For Science-oriented students: Computer Science 1MA3, 1MB3, 2MF3 and 2SB3, 3MG3, 3SC3, 3CA3, 3SD3.

   For Business-oriented students: Computer Science 1BA3, 1MB3, 2ME3, 4I03.

   Social Sciences and Humanities students: Computer Science 1ZA3 provides an introduction to computer use.
3. Arts and Science 1D06 serves as an equivalent prerequisite for upper level Computer Science courses, in which Mathematics 1A06 is a prerequisite.
4. The courses **to be introduced in 1990-91** are included after the current courses, and are presented at this time to enable students to plan their current course selection appropriately.

COMP SCI 1BA3 INTRODUCTION TO COMPUTING & COMPUTER USE FOR BUSINESS

Organization of microcomputers; introduction to wordprocessing; analytical and logical problem solving skills development using stuctured BASIC and electronic spreadsheets; with an introduction to descriptive statistics.
3 lects., 1 tut.; one term
Prerequisite: Registration in the Faculty of Business and one Grade 13 or OAC Mathematics credit, or Mathematics 1K03, 1L03, or 1M03. Not open to students who are registered in, or have received credit for, any of Computer Science 1A03, 1B03, 1H03, 1MA3, Engineering 1D03.

COMP SCI 1MA3 INTRODUCTION TO COMPUTER PROGRAMMING

Organization and characteristics of computers; introduction to packages; algorithmic development, stepwise refinement, modularization, searching and sorting methods, problem solving; data types, arithmetic/logical expressions, looping, arrays, subprograms, input/output, style, and program testing.
3 lects., 1 tut.; one term
Prerequisite: Two Grade 13 or OAC Mathematics credits, or one Grade 13 or OAC Mathematics credit and one of Mathematics 1K03, 1L03, or both Mathematics 1K03 and 1L03, or Mathematics 1M03. Not open to students who are registered in or have received credit for any of Computer Science 1A03, 1B03, 1H03, Engineering 1D03. Not open to students who have at least a B− in Computer Science 1BA3 or 1ZA3.

COMP SCI 1MB3 INTRODUCTION TO COMPUTER SCIENCE

Programming as a discipline; recursion, structured data types, structured progamming, analysis of algorithms, computational complexity, searching and sorting methods; introduction of a structured language.
3 lects.; one term
Prerequisite: One of Computer Science 1A03, 1B03, 1H03, 1MA3, Engineering 1D03, or a grade of at least B− in Computer Science 1BA3 or 1ZA3, **and** credit for, or concurrent registration in, one of Mathematics 1A06, 1B03, or both Mathematics 1L03, 1M03. Not open to students with credit in Computer Science 2B03. Students having credit in 2N03, 2P03, 2SB3 or 2ZB3 will lose that credit.

COMP SCI 1ZA3 INTRODUCTION TO COMPUTING & COMPUTER USE

Organization of microcomputers; introduction to wordprocessing; analytical and logical problem solving skills development using structured BASIC and electronic spreadsheets; with an introduction to descriptive statistics and file processing.
3 lects., 1 tut.; one term
Prerequisite: One Grade 13 or OAC Mathematics credit, or Mathematics 1K03, 1L03, or 1M03 is recommended. Not open to students who are registered in the Faculty of Business, or who are registered in, or have received credit for, any of Computer Science 1A03, 1B03, 1H03, 1MA3, 1BA3, Engineering 1D03.
Enrolment is limited.

COMP SCI 2MC3 DATA STRUCTURES AND ALGORITHMS I

State-transition diagrams and matrices, stacks, queues and lists. Advanced testing techniques and analysis of hashing algorithms. File structures, file handling; update and retrieval.
3 lects.; one term
Prerequisite: One of Computer Science 1MB3, 2B03, or 2ZB3 **and** *either* one of Mathematics 1A06, 1N06 or both Mathematics 1L03, 1M03, **and** *either* a current University Average of at least 7.0 *or* registration in one of the following programmes: any programme in Computer Science, any combined honours programme in Computer Science, Level II Honours Mathematics or Mathematics Major. Not open to students with credit in Computer Science 2L03.

COMP SCI 2MD3 DATA STRUCTURES AND ALGORITHMS II

Arrays, list structures, graphs; binary, search, and specialized tree structures. Efficient searching and sorting processing, symmetric/band/sparse matrices, memory management, pattern matching, indexed sequential files, flow graphs, networks. Abstract data types.
3 lects., one term
Prerequisite: Computer Science 2MC3 or 2L03. Not open to students with credit in Computer Science 3A03.

COMP SCI 2ME3 DESIGN OF INFORMATION SYSTEMS I
Introduction to "structured approach" to systems analysis, with emphasis on program development process; program design, data representation, structured tools for systems analysis and design, organization of data and files, data entry and audit techniques, report organization. COBOL will be applied within a microcomputer environment.
3 lects.; one term
Prerequisite: One of Computer Science 1MB3, 2ZB3, 2B03, 2P03. Not open to students with credit in Computer Science 2A03 or 3I03.

COMP SCI 2MF3 INTRODUCTION TO COMPUTER ARCHITECTURE
Introduction to the structure of computer systems; organization of central processing units, memory subsystems and input/output devices; introduction to machine language, assembler programming and system software.
3 lects.; one term
Prerequisite: One of Computer Science 1A03, 1B03, 1H03, 1MA3, Engineering 1D03, or a grade of at least B− in Computer Science 1BA3 or 1ZA3.

COMP SCI 2MJ3 DISCRETE STRUCTURES
An introduction to the basic concepts of discrete mathematics and discrete structures needed in many areas of computer science. Logic, combinatorics, graph theory and their applications are included.
3 lects.; one term
Prerequisite: Two Grade 13 or OAC Mathematics credits, or one Grade 13 or OAC Mathematics credit and one of Mathematics 1K03, 1L03, or both Mathematics 1K03 and 1L03, or Mathematics 1M03.

COMP SCI 2SB3 ADVANCED PROGRAMMING TECHNIQUES
An examination of algorithms for the solution of common scientific problems and their efficient implementation in FORTRAN, including analysis and estimation of both computational error and program efficiency.
3 lects.; one term
Prerequisite: One of Computer Science 1MA3, 1A03, 1B03, 1H03, or a grade of at least B− in Computer Science 1BA3 or 1ZA3, or Engineering 1D03, **and** one of Mathematics 1A06, 1M03, 1N06 *and* one of Mathematics 1B03, 1H05, 1L03. Not open to students with credit in Computer Science 1MB3, 2B03, 2N03, 2P03, 2ZB3.

COMP SCI 3CA3 COMPUTER ORGANIZATION AND ASSEMBLER PROGRAMMING
A second course in computer organization with particular emphasis on assembly language programming and software development tools.
2 lects., one lab; one term
Prerequisite: Computer Science 3MG3 or 3D03. Not open to students with credit in Computer Science 3T03.

COMP SCI 3EA3 INTRODUCTION TO SOFTWARE ENGINEERING
Methodologies for the development and maintenance of large programs. Problem specification, program design and implementation. Software reliability, testing, maintenance, modularity and resource management. A term project using the programming language Ada within a team environment.
2 lects., 1 lab; one term
Prerequisite: Computer Science 2MC3 or 2L03. Not open to students with credit in Computer Science 3E03.

COMP SCI 3GA3 INTRODUCTION TO COMPUTER GRAPHICS
Principles of computer graphics. Data structures and algorithms, hardware and software systems for graphics. Object modelling and display techniques: visual realism, perspective, hidden surface and shading algorithms. High-level graphics languages, graphics primitives and standards.
3 lects.; one term
Prerequisite: Completion of or registration in Mathematics 3B03, and one of Computer Science 2MD3, 3A03.

COMP SCI 3IA3 LIST PROCESSING AND LOGIC PROGRAMMING
A practical study of the data and control structures for artificial intelligence systems: symbolic expressions; LISP (lists, list processing functions, forms); POP-11 (user stack, structures, pattern matching, macros, backtracking); resolution principle; PROLOG (terms, clauses, matching, backtracking).
3 lects.; one term
Prerequisite: Computer Science 2MD3 and 2MJ3, or 3A03.

COMP SCI 3MG3 COMPUTER SYSTEM ARCHITECTURE
Computer systems involving both hardware and software components; control, storage and input/output systems; assemblers, loaders, compilers; introduction to operating systems and virtual memory techniques.
3 lects.; one term
Prerequisite: Computer Science 1MB3 and 2MF3, or Electrical Engineering 2H03, or Computer Science 1C03 and 2B03, or Computer Science 1C03 and 1MB3. Not open to students with credit in Computer Science 3D03.

COMP SCI 3MH3 PRINCIPLES OF OPERATING SYSTEMS
The purpose, systematic design and implementation of modem operating systems; synchronization of concurrent processes, resource sharing, job scheduling, resource protection, privacy and inter-process communication.
3 lects.; one term
Prerequisite: One of Computer Science 2MD3, 3A03, and one of Computer Science 3MG3, 3D03. Not open to students with credit in Computer Science 3C03.

COMP SCI 3MI3 ORGANIZATION OF PROGRAMMING LANGUAGES
A comparative study of programming languages emphasizing the run-time behaviour of programs. Introduction to formal methods of language definition.
3 lects.; one term
Prerequisite: Computer Science 2MD3 or 3A03. Not open to students with credit in Computer Science 3B03.

COMP SCI 3MP6 PROJECT
Under the supervision of a faculty member, teams of 2-3 students implement, write up and defend a substantial computer science project, which will normally originate in an area of the University other than the Department of Computer Science and Systems.
Two terms, no lectures.
Prerequisite: Registration in Level III of the B.Sc. programme in Computer Science and Systems.

COMP SCI 3SC3 SCIENTIFIC DATA PROCESSING
Basic techniques of constructing large scientific data processing systems, file organization and techniques for managing large volumes of data. Computer graphics, data representation and systems design will be discussed.
3 lects.; one term
Prerequisite: Computer Science 1MB3, 2B03, 2N03, 2P03, 2SB3 or 2ZB3. Not open to students with credit in Computer Science 3P03.

COMP SCI 3SD3 COMPUTER SIMULATION TECHNIQUES
Techniques for the application of computer simulation software to scientific and engineering problems, especially queueing and network problems.
3 lects.; one term
Prerequisite: One of Computer Science 1MB3, 2B03, 2SB3, 2ZB3, 2N03 or 2P03. Not open to students with credit in Computer Science 4W03.

COMP SCI 3TA3 INTRODUCTION TO FORMAL LANGUAGE THEORY
Mathematical properties of formal languages; tools for language classification and definition. Grammars and automata. Finite and deterministic automata. The properties of regular and context-free languages.
3 lects.; one term
Prerequisite: One of Computer Science 2MD3, 3A03, and one of Mathematics 2F03, 2F04, 2J06 and Computer Science 2MJ3. Not open to students with credit in Computer Science 4J03.

COMP SCI 4CB3 ADVANCED COMPUTER SYSTEM ARCHITECTURE
A study of traditional performance enhancement techniques: pipelining, RISC, prefetch, cache; modern high performance systems: supercomputers, array processors, clusters, networking architectures.
2 lects., one lab; one term
Prerequisite: Computer Science 3MG3 or 3D03, or Computer Engineering 3HB3 or registration in, or completion of, Physics 4D06.

COMP SCI 4E03 COMPILERS
Formal description of programming languages and the construction of compilers and interpreters for the translation of programs into executable form.
3 lects.; one term
Prerequisite: Completion of Level III of a Computer Science or Computer Engineering programme.
Last offered in 1989-90.

COMP SCI 4G06 PROJECT
The design and implementation of a large program, or suite of programs, and its documentation. Students work in small teams.
Prerequisite: Registration in Level IV of a programme in which Computer Science 4G06 is specified and completion of one of Computer Science 2ME3, 3A03, 3I03. Not open to students who are registered in or have completed Computer Science 3R06.
Last offered in 1989-90.

COMP SCI 4I03 MANAGEMENT INFORMATION SYSTEMS
The use of modern computer technology in the information processing and planning processes of small and large organizations. Emphasis will be placed on data design and office automation.
3 lects.; one term
Prerequisite: Computer Science 2ME3 or 3I03.
Last offered in 1989-90.

COMP SCI 4IB3 INTRODUCTION TO ARTIFICIAL INTELLIGENCE
A broad study of the major areas of artificial intelligence: perception, pattern recognition, machine learning, image processing, scene analysis, speech processing; search algorithms and problem solving, production systems, backtracking and graph search techniques, GPS, STRIPS, PLANNER; PROLOG.
3 lects.; one term
Prerequisite: Computer Science 3IA3.

COMP SCI 4IC3 THE ARCHITECTURE OF EXPERT SYSTEMS
"Hands-on" experience in the design and development of knowledge-based systems applying human expertise to specific areas of problem-solving: knowledge representations, knowledge engineering, and knowledge-based programming.
3 lects.; one term
Prerequisite: Computer Science 3IA3.

COMP SCI 4L03 DATABASE MANAGEMENT SYSTEM DESIGN

A first course on database management systems which emphasizes the concepts and structures necessary for their design and implementation. Topics include: data models, data normalization, data-description languages, query facilities, file organization, file security, data integrity and reliability and concurrency.

3 lects.; one term

Prerequisite: Computer Science 2MD3 or 3A03 and one of Computer Science 2A03, 2ME3; or registration in Computer Engineering or Computer Engineering and Management.

Last offered in 1989-90.

COMP SCI 4X03 THE MATHEMATICAL ANALYSIS OF ALGORITHMS

An introduction to the analysis of algorithms dealing with the relative speed of alternate algorithms and related matters.

3 lects.; one term

Prerequisite: Computer Science 2MD3 or 3A03, and one of Mathematics 2F03, 2F04, 2J06.

Last offered in 1989-90.

COMP SCI 4Z03 DIRECTED READINGS

Directed readings in an area of computer science of interest to the student and the instructor.

Prerequisite: Registration in Level IV of an Honours programme in Computer Science and permission of the Chairman of the Department.

FIRST OFFERED 1990-91

The following courses will be offered **starting in 1990-91**. Students should consider the prerequisites carefully in planning their current course selection.

COMP SCI 4CC3 ADVANCED OPERATING SYSTEMS

A study of modern operating systems ranging from the large-scale interactive to the small real-time systems; interconnection between microcomputers and mainframes; message passing techniques; networks; design of name servers and file servers; programming languages for implementing distributed operating systems.

2 lects.; 1 lab; one term

Prerequisite: Computer Science 3MH3 or 3C03.

COMP SCI 4CD3 TOPICS IN COMPUTER COMMUNICATIONS

An advanced course dealing with various communications topics such as: wide area networks (DATAPAC, TYMNET); local area networks (ETHERNET, TOKEN RING); instrumentation buses (IEEE-488, CAMAC); distributed real-time systems (Waterloo PORT); electronic messaging (TELETEX, information utilities).

3 lects.; one term

Prerequisite: Computer Science 3MH3 or 3C03.

COMP SCI 4CP6 COMPUTER SYSTEMS PROJECT

Under the supervision of a faculty member, teams of 2-3 students implement, write up and defend a substantial project in Computer Systems.

Two terms, no lectures.

Prerequisite: Registration in Level IV of any Honours or Major Computer Science or joint Computer Science programme, and registration in or credit for each of Computer Science 3CA3, 4CB3, 4CC3, 4CD3. Not open to students who are registered in or have received credit for any of Computer Science 3MP6, 3R06, 4MP6, 4EP6, 4IP6, 4TP6, 4G06.

COMP SCI 4EB3 DATABASE MANAGEMENT SYSTEM DESIGN

A study of the concepts and structures for the design of database management systems. Topics include: data models, data normalization, data-description languages, query facilities, file organization and security, data integrity and reliability, distributed systems. The programming language C and the UNIX operating system are used.

3 lects.; one term

Prerequisite: Computer Science 2MD3 or 3A03. Not open to students with credit in Computer Science 4L03.

COMP SCI 4EC3 DESIGN OF INFORMATION SYSTEMS II

The analysis, design and development of information systems, with an emphasis on the business/industrial environment. Alternatives to structured design will be considered. Topics include: structured analysis, iterative design, hardware/software evaluation, business documents, dual-entry bookkeeping, the human interface, office automation, and integrated systems.

3 lects.; one term

Prerequisite: Computer Science 2ME3. Not open to students with credit in Computer Science 4I03.

COMP SCI 4ED3 SOFTWARE ENGINEERING APPLICATIONS

A continuation of Computer Science 3EA3. Use of advanced software specification techniques and software tools to support program development. A large-scale team project produces high-quality production software.

3 lects.; one term

Prerequisite: Computer Science 3EA3 or 3E03. Not open to students with credit in Computer Science 4F03.

COMP SCI 4EP6 SOFTWARE ENGINEERING PROJECT

Under the supervision of a faculty member, teams of 2-3 students implement, write up and defend a substantial project in Software Engineering and Information Systems.

Two terms, no lectures.

Prerequisite: Registration in Level IV of any Honours or Major Computer Science or joint Computer Science programme, and registration in or credit for each of Computer Science 3EA3, 4EB3, 4EC3, 4ED3. Not open to students who are registered in or have received credit for any of Computer Science 3MP6, 3R06, 4MP6, 4CP6, 4IP6, 4TP6, 4G06.

COMP SCI 4GB3 COMPUTATIONAL GEOMETRY

Discrete geometry from an algorithmic point of view. Worst-case and expected complexity for geometric algorithms. Problems of searching, subdivision, proximity and intersection. Geometric transformations with applications to problems in object modelling, computer graphics, and computer vision.

3 lects.; one term

Prerequisite: Completion of or registration in Mathematics 3B03, and one of Computer Science 2MD3, 3A03, or a grade of at least B– in Computer Science 1MB3 or 2ZB3. Mathematics 3P03 and one of Computer Science 4TD3, 4X03 are also recommended.

COMP SCI 4ID3 ADVANCED TOPICS IN ARTIFICIAL INTELLIGENCE

Current trends in the field of artificial intelligence. Topics include knowledge representation and acquisition, language understanding, models of cognition and perception, machine learning.

3 lects.; one term

Prerequisite: Computer Science 4IB3.

COMP SCI 4IP6 ARTIFICIAL INTELLIGENCE PROJECT

Under the supervision of a faculty member, teams of 2-3 students implement, write up and defend a substantial computer science project in Artificial Intelligence.

Two terms, no lectures.

Prerequisite: Registration in Level IV of any Honours or Major Computer Science or joint Computer Science programme, and registration in or credit for each of Computer Science 3IA3, 4IB3, 4IC3, 4ID3. Not open to students who are registered in or have received credit for any of Computer Science 3MP6, 3R06, 4MP6, 4CP6, 4EP6, 4TP6, 4G06.

COMP SCI 4MP6 PROJECT FOR COMBINED PROGRAMMES

Under the supervision of a faculty member, teams of 2-3 students implement, write up and defend a substantial project, in the area of the combined programme.

Two terms, no lectures.

Prerequisite: Registration in Level IV of any combined Honours or combined Major Computer Science programme.

COMP SCI 4TB3 COMPILER CONSTRUCTION

Formal description of programming language syntax and semantics. Compiler concepts and techniques, and their application in a compiler team project. Compiler-compiler methods.

3 lects.; one term

Prerequisite: Computer Science 3TA3 or 4J03, and 3MI3 or 3B03. Not open to students with credit for Computer Science 4E03.

COMP SCI 4TC3 RECURSIVE FUNCTION THEORY AND COMPUTABILITY

Turing machines, recursive and primitive recursive functions, decidability and undecidability with applications to formal language theory, logic and algebra.

3 lects.; one term

Prerequisite: Computer Science 3TA3 or 4J03. Not open to students with credit for Mathematics 4S03.

COMP SCI 4TD3 ANALYSIS OF ALGORITHMS

The analysis of classes of algorithms, especially divide-and-conquer, greedy, and backtracking algorithms. An introduction to the theory of computational complexity. Description and analysis of particular algorithms of practical or theoretical importance in computer science.

3 lects.; one term

Prerequisite: Computer Science 2MJ3 and one of Computer Science 2MD3, 3A03, and one of Mathematics 2F03, 2J06. Not open to students with credit in Computer Science 4X03.

COMP SCI 4TP6 THEORY OF COMPUTATION PROJECT

Under the supervision of a faculty member, teams of 2-3 students implement, write up and defend a substantial project in the Theory of Computation.

Two terms, no lectures.

Prerequisite: Registration in Level IV of any Honours or Major Computer Science or joint Computer Science programme, and registration in or credit for each of Computer Science 3TA3, 4TB3, 4TC3, 4TD3. Not open to students who are registered in or have received credit for any of Computer Science 3MP6, 3R06, 4MP6, 4CP6, 4EP6, 4IP6, 4G06.

Croatian

Courses in *Croatian* are administered within the Department of Modern Languages of the Faculty of Humanities.

CROATIAN 2C03 THE EARLY CULTURAL HERITAGE

A survey of the culture and literature of the Croats from their arrival in the Balkans to the emergence of a national culture during the Illyrian Movement. Readings in the original.

3 hrs.; one term

Prerequisite: Serbo-Croatian 1Z06; or permission of the Department.

Students with prior knowledge of the language may be admitted to Croatian 2C03 upon successful completion of a placement test.

CROATIAN 3C03 CONTEMPORARY CROATIAN CULTURE
A survey of the most significant trends in the culture and literature of the Croats from the end of the Illyrian Movement to the present day. Readings in the original.
3 hrs.; one term
Prerequisite: Croatian 2C03; or permission of the Department.
Students with prior knowledge of the language may be admitted to Croatian 3C03 upon successful completion of a placement test.

Drama

Courses and programmes in *Drama and Film* at McMaster University are supervised and co-ordinated by an interdisciplinary Committee on Dramatic Arts. Students who plan to register in a programme in Drama must consult the Chairman of the Committee before selecting courses.

Committee of Instruction

A. Hammond (English)/Chairman
L. Braswell-Means (English)
A. Brennan (English)
J. Coldwell (English)
D. Duncan (English)
E. Inman (Acting)
S.B. Johnson/B.A. *(Guelph)*, M.A. *(Toronto)*, Ph.D. *(New York)*
F. Minelli (Modern Languages - Hispanic Studies)
V. Moore (Dance)
E. Nardocchio (French)
G. Petrie (Film)
B. Pocknell (French)
C. Rouben (French)
T. Shrive (Technical)
G. Thomas (Modern Languages - Russian)
R. Van Dusen (Modern Languages - German)
R. Vince (English)
D. Wilson (Dance)

DRAMA 1A06 INTRODUCTION TO DRAMA
An exploration of the theatrical medium through the study of plays from major periods of Western drama, including plays featured in the year's Drama productions.
2 lects., 1 tut.; two terms
Prerequisite: Open.

DRAMA 2A06 DRAMA IN PERFORMANCE: INTRODUCTION TO ACTING
Contemporary methods of acting. Study and presentation of scenes from modern drama. Basic skills of voice, speech and movement. Participation in campus drama by arrangement with the instructor.
2 studio practice (2 1/2 hrs.); two terms
Prerequisite: Registration in a programme in Drama; or permission of the instructor after audition.

DRAMA 2B06 THE DEVELOPMENT OF ENGLISH DRAMA
English drama from the medieval period to the close of the 18th century (excluding Shakespeare). 3 lects.; two terms
Prerequisite: Registration in a programme in Drama; or permission of the Drama Chairman.
Same as English 2B06.

DRAMA 2C03 PERFORMANCE AND THE IDEA OF THEATRE IN THE MIDDLE AGES
A survey of popular, courtly and religious modes of performance from the tenth to the sixteenth century.
3 lects.; one term
Prerequisite: Registration in a programme in Drama; or permission of the Drama Chairman.

DRAMA 2E03 GREEK AND ROMAN DRAMA
Reading of selected Greek and Roman tragedies and comedies. Lectures about the development of the drama, presentation of plays, the authors and their works, and the influence of classical drama on later drama.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Same as Classical Civilization 2E03 and Comparative Literature 2B03.

DRAMA 2F03 OPERA I: RENAISSANCE TO ROMANTIC
An analysis of selected operatic works from 1600 to 1850, exploring the nature of opera as a theatrical and musical form.
3 lects.; one term
Prerequisite: Open to students in Level II and above.

DRAMA 2X06 THE ART OF THE FILM
An introduction to film style and technique through a detailed critical analysis of major works from the silent period to the present day.
2 lects. plus one weekly film screening; two terms.
Prerequisite: Six units of Humanities, preferably Drama 1A06; and permission of the Drama Chairman.
Same as Art History 2X06.
Enrolment is limited.

DRAMA 3A06 DRAMA IN PERFORMANCE: STYLES OF ACTING
Study and presentation of scenes from various historical theatres from the Greeks to the present. Extension of acting skills to include stylistic versatility. Participation in campus drama by arrangement with the instructor.
Class meets twice a week, total 5 hrs.; two terms
Prerequisite: Drama 2A06; or permission of the instructor.

DRAMA 3B03 TOPICS IN THEATRE HISTORY: INDEPENDENT STUDY
Students who wish to undertake independent study must consult the Drama Chairman prior to registration.
One term.
Prerequisite: Registration in a programme in Drama; or permission of the Drama Chairman.

DRAMA 3BB3 CONTEMPORARY QUEBEC THEATRE
Contemporary experimental theatre, and representative playwrights such as Marcel Dubé and Michel Tremblay.
3 lects.; one term
Prerequisite: French 2F03 or 2FF3; or permission of the Department of French. Note that texts and instruction are in French. Students taking this course as Drama 3BB3 must be registered in a programme in Drama, and may offer written work in English.
Same as French 3BB3.

DRAMA 3C03 MODERN EUROPEAN DRAMA FROM IBSEN TO PIRANDELLO
A study of representative plays by eight major dramatists, including Strindberg, Chekhov, Gorki, Wedekind and Kaiser.
1 seminar (2 hrs.), plus playreadings; one term
Prerequisite: Drama 1A06; or permission of the instructor.
Offered in 1989-90. Alternates with Drama 3CC3.
Same as Comparative Literature 3E03.

DRAMA 3CC3 MODERN EUROPEAN DRAMA FROM BRECHT TO THE PRESENT
A study of representative plays by ten major dramatists, including Garcia Lorca, Cocteau, Frisch, Sartre, Weiss, Genet, Dario Fo.
1 seminar (2 hrs), plus playreadings; one term
Prerequisite: Drama 1A06, or permission of the instructor.
Alternates with Drama 3C03.
Same as Comparative Literature 3CC3.

DRAMA 3D03 TECHNICAL ASPECTS OF THE THEATRE
A survey of the theory and practice of all the technical skills involved in a theatrical production: set design, set construction, lighting, sound, carpentry, properties, costumes. Technical assistance with Drama productions.
2 hrs. first term; 1 hr. (workshop) second term
Prerequisite: Registration in a programme in Drama; Departmental permission slip required.
Enrolment is limited.

DRAMA 3DD3 RUSSIAN DRAMA SINCE 1800
An introduction in translation to the major works of Russian Theatre.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Offered in 1989-90 and in alternate years.
Same as Russian 3D03.

DRAMA 3F03 OPERA II: ROMANTIC TO MODERN
An analysis of selected operatic works from 1850 to the present, tracing the evolution of opera as a theatrical and musical form.
3 lects.; one term
Prerequisite: Open to students in Level II and above. Drama 2F03 is recommended.

DRAMA 3FF3 STUDIES IN OPERA
3 lects.; one term
Prerequisite: Registration in Level III or IV of any programme; or permission of the instructor. One of Drama 2F03 or 3F03 is recommended.
Drama 3FF3 may be repeated, if on a different topic, to a total of six units.

DRAMA 3K06 SHAKESPEARE
An extensive critical reading and discussion of selected plays.
3 lects.; two terms
Prerequisite: Registration in Level III or IV of a programme in Drama; or permission of the Drama Chairman.
Same as English 3K06.

DRAMA 3M03 RENAISSANCE AND BAROQUE THEATRE
The classical revival and its influence on scene design and theatre architecture, dramatic theory and genre; the interaction of classical and medieval conventions in theatres of England and Spain.
3 lects.; one term
Prerequisite: Registration in Level III or IV of a programme in Drama; or permission of the instructor.
Alternates with Drama 3MM3.

DRAMA 3MM3 NEOCLASSICAL AND ROMANTIC THEATRE
A survey of the neoclassical theatres of England and France; the influence of neoclassical doctrine on European theatre; and the reactions to it in the Romantic theatres of Germany and France.
3 lects.; one term
Prerequisite: Registration in Level III or IV of a programme in Drama; or permission of the instructor.
Not offered in 1989-90. Alternates with Drama 3M03.

DRAMA 3P03 MODERN DRAMA IN ENGLISH
A representative selection of plays by modern British, Irish, and North American dramatists will be examined in order to study the relationship between drama and society in our age, as well as conventions and experiments in the contemporary theatre.
3 lects.; one term
Prerequisite: Drama 1A06, or one of English 1A06, 1B06, 1D06.
Same as English 3P03.

DRAMA 3PP3 PLAYS IN PERFORMANCE
A Study of plays currently performed at the Stratford Shakespeare Festival. Students attend performances and seminars in Stratford for one week and classes at McMaster for two weeks.
Prerequisite: Open to students in Level II and above.
Offered in Summer Day Session only.
Drama 3PP3 may be repeated, if on a different topic, to a total of 6 units.

DRAMA 3Q03 SEVENTEENTH-CENTURY FRENCH DRAMA
A study of selected plays of Corneille, Molière and Racine.
3 lects.; one term
Prerequisite: Drama 1A06 and French 1A06 or 1B06; or permission of the Department of French. Note that texts and instruction are in French. Students taking this course must be registered in a programme in Drama and may offer written work in English.
Same as French 3Q03.

DRAMA 3R03 THE AMERICAN CINEMA I
A survey of some of the predominant features of the American Cinema from its beginning to 1940. Emphasis will be placed both on the artistic value of the films and on their social significance and impact.
2 lects., plus one weekly film screening; one term
Prerequisite: Drama 2X06; or permission of the instructor, or the Drama Chairman. Not available to students with credit in Drama 3R06.
Same as Art History 3F03.

DRAMA 3RR3 THE AMERICAN CINEMA II
A survey of some of the predominant features of the American Cinema from 1940 to the present day. Emphasis will be placed both on the artistic value of the films and on their social significance and impact.
2 lects., plus one weekly film screening; one term
Prerequisite: Drama 2X06; or permission of the instructor or the Drama Chairman. Not available to students with credit in Drama 3R06.
Same as Art History 3FF3.

DRAMA 3XX3 TOPICS IN 20TH-CENTURY DRAMA
1989-90: Modern Canadian Drama
Representative plays from various Canadian regions studied with attention to their dramatic form and their treatment of regional as well as general social, historical and political themes.
3 lects.; one term
Prerequisite: Drama 1A06, or one of English 1A06, 1B06, 1D06.
Drama 3XX3 may be repeated, if on a different topic, to a total of 6 units.
Same as English 3XX3.

DRAMA 3Y03 FRENCH CINEMA
A survey of French Cinema from its beginnings to the present, through detailed critical analysis of major works.
2 lects., plus one weekly film screening; one term.
Prerequisite: Drama 2X06, or French 1A06 or 1B06; or permission of the instructor or the Drama Chairman.
Same as Art History 3Y03 and French 3Y03.

DRAMA 4A06 PRINCIPLES OF STAGE DIRECTING
Play analysis, schedule planning, rehearsal techniques, technical stagecraft required to bring a play to performance. Direction of a play for performance under the supervision of the instructor.
Class meets twice a week, total 5 hrs.; two terms
Prerequisite: Drama 3A06 and registration in an Honours programme in Drama; or permission of the instructor. Departmental permission slip required.
Enrolment is limited.

DRAMA 4B03 TOPICS IN DRAMA: INDEPENDENT STUDY
Students who wish to undertake independent study must consult the Drama Chairman prior to registration.
One term
Prerequisite: Registration in a programme in Drama; or permission of the Drama Chairman.

DRAMA 4D03 THE MEDIEVAL THEATRE OF ENGLAND AND FRANCE
A study of representative plays together with a consideration of medieval techniques of staging.
1 lect., 1 tut. (2 hrs.); one term
Prerequisite: Registration in Level III or IV of any programme; or permission of the Drama Chairman.

DRAMA 4DD3 SPANISH DRAMA OF THE GOLDEN AGE
A study of plays by major Spanish playwrights of the period 1550-1680, including works by Cervantes, Lope, Tirso and Calderón, in English translation.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Offered in alternate years. Not offered in 1989-90.
Same as Hispanic Studies 4L03.

DRAMA 4E03 THEORY OF DRAMA AND THEATRE
A study of the major theoretical documents from the Greeks to the present.
3 lects.; one term
Prerequisite: Registration in Level III or IV of a programme in Drama; or permission of the Drama Chairman.

DRAMA 4F03 STUDIES IN THEATRE HISTORY
Selected topics for research, analysis and discussion, with particular attention to the theatre historian's sources and methods.
3 lects.; one term
Prerequisite: Registration in Level III or IV of a programme in Drama; or permission of the Drama Chairman.

DRAMA 4H03 LITERATURE AND FILM
An examination of the particular characteristics of both literature and film and the inter-relationships between them through a detailed study of selected novels, short stories and plays and the films that have been based on them.
3 lects., plus one weekly film screening; one term
Prerequisite: Registration in Level III or IV of a programme in Drama or Literature or Art History; or permission of the instructor or the Drama Chairman. It is recommended that students should already have taken Drama 2X06.
Same as Art History 4HH3, English 4H03 and Comparative Literature 4H03.

DRAMA 4J03 PERSPECTIVES IN DANCE: DANCE IN CONTEMPORARY SOCIETY
A study of dance forms in the 20th century. Students will view films, dance performances and participate in dance workshops.
3 hrs. (lect., seminars); one term
Prerequisite: Permission of the instructor.
Same as Physical Education 4J03.

DRAMA 4K03 FILM COMEDY
A study of the tradition of film comedy within a framework of comic theory in general and especially in its application to drama.
2 lects., plus one weekly film screening; one term
Prerequisite: Drama 2X06; or permission of the instructor, or the Drama Chairman. Not available to students with credit for this topic taken under Drama 4D03.
Same as Art History 4KK3.

DRAMA 4M03 MODERN EUROPEAN THEATRE HISTORY
A study of the major influences that have shaped the growth of modern theatre movements in Europe from the late nineteenth century to the present.
1 seminar (2 hrs.); one term
Prerequisite: Registration in Level III or IV of a programme in Drama; or permission of the instructor.
Offered in alternate years.

Economics

Faculty as of January 15, 1989

Stuart Mestelman/*Chairman*
A. Leslie Robb/Acting Associate Chairman

Professors Emeriti

John E.L. Graham/B.A. *(Toronto)*, M.A., B.Litt, *(Oxford)*
William D.G. Hunter/B.A. *(Oxford)*, M.A. *(Edinburgh)*
R. Craig McIvor/B.A. *(Western)*, M.A., Ph.D. *(Chicago)*, F.R.S.C.
William R. Scammell/B.Comm.Sc. *(Queen's, Belfast)*, Ph.D. *(Wales)*
Robert W. Thompson/B.A. *(Toronto)*, M.A. *(Queen's)*, Ph.D. *(London)*

Professors

Syed Ahmad/M.A., LL.B. *(Aligarh)*, M.Sc. (Econ.), D.Sc. (Econ.) *(London)*
Martin J. Browning/B.Sc., M.Sc. *(London)*
John B. Burbidge/B.A., Ph.D. *(McGill)*
Kenneth S. Chan/B.Sc. *(Toronto)*, M.A.., Ph.D. *(Brown)*
Frank T. Denton/M.A. *(Toronto)*, F.R.S.C.
David H. Feeny/B.A. *(Indiana)*, M.A., Ph. D. *(Wisconsin-Madison)*
Peter J. George/B.A., M.A., Ph.D. *(Toronto)*
Alan J. Harrison/B.A., M.A., Ph.D. *(Essex)*
James A. Johnson/M.A., Ph.D. *(Minnesota)*
Atif A. Kubursi/B.A., *(American University, Beirut)*, M.A., Ph.D. *(Purdue)*

Stuart Mestelman/B.A. *(Pittsburgh)*, M.S., Ph.D. *(Purdue)*
Ernest H. Oksanen/A.M. *(Michigan)*, B.A., Ph.D. *(Queen's)*
A. Leslie Robb/M.A. *(British Columbia)*, Ph.D. *(Essex)*
William M. Scarth/B.A. *(Queen's)*, M.A. *(Essex)*, Ph.D. *(Toronto)*
Byron G. Spencer/B.A. *(Queen's)*, Ph.D. *(Rice)*
James R. Williams/ M.A., Ph.D. *(Minnesota)*
David M. Winch/ B.Sc. (Econ.), Ph.D. *(London)*, M.A. *(Cambridge)*, F.R.S.C.

Associate Professors

David W. Butterfield/B.S., M.S. Eng. *(Calif. Inst. of Tech.)*, A.B., M.A., Ph.D. *(California-Berkley)*
Donald A. Dawson/A.M. *(Chicago)*, Ph.D. *(Western)*, N.D.C.
Martin D. Dooley/B.A. *(Indiana)*, M.S., Ph.D. *(Wiconsin-Madison)*
Stephen R.G. Jones/B.A. *(Cambridge)*, Ph.D. *(California-Berkeley)*
Melvin L. Kliman/B.A. *(Manitoba)*, M.A. *(Queen's)*, Ph.D. *(Minnesota)*
Peter J. Kuhn/B.A. *(Carleton)*, Ph.D. *(Harvard)*
John E. Leach/B.A. *(Alberta)*, M.A., Ph.D. *(Queen's)*
Wayne Lewchuk/M.A. *(Toronto)*, Ph.D. *(Cambridge)*
Lonnie J. Magee/B.A. Math. *(Waterloo)*, M.A., Ph.D. *(Western)*
R. Andrew Muller/B.A. *(McGill)*, M.A., Ph.D. *(Toronto)*
Martin J. Osborne/B.A. *(Cambridge)*; Ph.D. *(Stanford)*
Michael R. Veall/B.A. *(McMaster)*, M.A. *(Western)*, Ph.D. *(M.I.T.)*
J. Douglas Welland/B.A. *(McMaster)*, M.A., Ph.D. *(Minnesota)*

Assistant Professors

Peter J. McCabe/A.B. *(Boston College)*, Ph.D. *(Northwestern)*

Associate Members

M. Luke Chan/ (Business) B.Sc. *(University of Prince Edward Island)*, M.A., Ph.D. *(McMaster)*
Jeremiah E. Hurley/ (Epidemiology and Biostatistics) B.A. *(John Carroll)*, M.A., Ph.D. *(Wisconsin-Madison)*
I. Krinsky/ (Business) B.A., M.A. *(Tel-Aviv)*, Ph.D. *(McMaster)*
George J. Papageorgiou/ (Geography) Dipl. in Architecture *(National Technical, Athens)*, M.C.P., Ph.D. *(Ohio State)*
Gregory L. Stoddart/ (Epidemiology and Biostatistics) B.A. *(Western)*, Ph.D. *(British Columbia)*

Department Notes:

1. Not all the Economics courses listed in this Calendar are taught every year. Students are advised to consult the timetable published by the Office of the Registrar, or the Department handbook for information on current offerings.
2. Students with strong academic records, particularly those from other departments, may be permitted to enrol in courses for which they have not completed all prerequisites. Such students must have the permission of the instructor.
3. Registration in all courses marked ** listed as selected topics, independent research, individual readings, and honours essays requires written permission of the Department. Registration with appropriate permission must be completed no later than the last day for registration as stated in this Calendar in the section *Sessional Dates*.

ECON 1A06 INTRODUCTORY ECONOMICS
An introduction to the method and theory of economics, and their application to the analysis of contemporary economic problems.
3 hrs.; two terms
Prerequisite: Open.

ECON 2B03 ANALYSIS OF ECONOMIC DATA I
Application of statistical concepts to the analysis of economic data, with attention to Canadian sources. Regression analysis is emphasized. Topics may also include index numbers.
3 hrs.; one term
Prerequisite: Economics 1A06 with a grade of at least C–, and Mathematics 1K03 (or Grade 13 or OAC Calculus) and 1L03. Not open to students with credit or concurrent registration in any of Economics 3O06, Chemical Engineering 4C03, Commerce 2QA3, Geography 2L03, Political Science 2F06, Psychology 2G03 or 2R06, Sociology 2Y03 or 3H06, or any Statistics course other than Statistics 2D03. Not open to students who are required to take Commerce 2QA3.

ECON 2G03 INTERMEDIATE PRICE THEORY
Elements of consumer behaviour; production and cost, price and output determination under various market structures; employment of inputs.
3 hrs.; one term
Prerequisite: Economics 1A06 with a grade of at least C–, or Economics 1A06 and registration in a Commerce programme; and Mathematics 1K03 (or Grade 13 or OAC Calculus). Students who have not completed Mathematics 1L03 and 1M03 are strongly advised to take them concurrently with this course. Not open to students with credit or concurrent registration in Economics 2L06.

ECON 2H03 INTERMEDIATE INCOME AND EMPLOYMENT THEORY
Elements of national accounting; basic models of income determination; inflation and unemployment in the Canadian context.
3 hrs.; one term
Prerequisite: Economics 1A06 with a grade of at least C–, or Economics 1A06 and registration in a Commerce programme; and Mathematics 1K03 (or grade 13 or OAC Calculus). Students who have not completed Mathematics 1L03 and 1M03 are strongly advised to take them concurrently with this course. Not open to students with credit or concurrent registration in Economics 2M06.

ECON 2K03 ECONOMIC HISTORY OF CANADA
A survey of the changing structure of the Canadian economy from the colonial period to the present; early significance of primary production for export markets; emerging domestic markets and industrialization; government's role in promoting the development of the national economy.
3 hrs.; one term
Prerequisite: At least C– in Economics 1A06. Not open to students with credit for Economics 2K06.

ECON 2L06 INTERMEDIATE MICROECONOMICS
Consumer behaviour; production and cost; price and output determination under various market structures; factor pricing and distribution of factor payments; general equilibrium; welfare economics.
3 hrs.; two terms
Prerequisite: Economics 1A06 with a grade of at least C–, and Mathematics 1K03 (or grade 13 Calculus). Students who have not completed Mathematics 1L03 and 1M03 are strongly advised to take them concurrently with this course.
A student receiving credit for Economics 2G03 may receive only 3 additional units of credit for Economics 2L06.

ECON 2M06 INTERMEDIATE MACROECONOMICS
National income accounting and related topics; models of output and price determination; theories of monetary and fiscal policy applied to the Canadian economy.
3 hrs.; two terms
Prerequisite: Economics 1A06 with a grade of at least C–, and Mathematics 1K03 (or grade 13 Calculus). Students who have not completed Mathematics 1L03 and 1M03 are strongly advised to take them concurrently with this course.
A student receiving credit for Economics 2H03 may receive only 3 additional units of credit for Economics 2M06.

ECON 2T03 ECONOMICS OF TRADE UNIONISM AND LABOUR
Topics will include the economics of the labour market, of trade unionism, of work, the impact of trade unions on the labour market, economic theories of strikes and trade unions and the state.
Lectures and discussion; one term
Prerequisite: Economics 1A06
Same as Labour Studies 3B03.
Enrolment is limited.

ECON 3A03 ADVANCED ECONOMIC THEORY I
Mathematically oriented approaches to the analysis of the behavior of individual consumers, workers and firms.
3 hrs.; one term
Prerequisite: Mathematics 1M03 and an average of at least 7.0 in Economics 2L06 and 2M06; or permission of the instructor. Mathematics 2L03 is recommended.

ECON 3AA3 ADVANCED ECONOMIC THEORY II
Comparative static and dynamic analysis of macroeconomic models.
3 hrs.; one term
Prerequisite: At least C– in Economics 3A03.

ECON 3B03 PUBLIC FINANCE
Public sector economics. Topics are selected from: public good provision; market failure; public choice; wealth, expenditure and income taxation; intergovernmental fiscal relations; government budgeting.
3 lects.; one term
Prerequisite: Economics 2G03 or 2L06. Not open to students receiving credit for Economics 3C06.

ECON 3C06 PUBLIC FINANCE
Theory and practice of public finance with special reference to Canada. Topics include: government expenditure criteria, fiscal policy; taxation of income, wealth and expenditure; intergovernmental fiscal relations.
3 hrs.; two terms
Prerequisite: Economics 2G03 or 2L06.
A student who has credit for Economics 3B03 may receive only 3 additional units of credit for Economics 3C06.

ECON 3D03 LABOUR ECONOMICS
Introduction to the economics of the labour market; demand for labour by the firm and industry; supply of labour by the individual; investment in human capital.
3 hrs.; one term
Prerequisite: Economics 2G03 or 2L06.

ECON 3E03 TOPICS IN LABOUR ECONOMICS
Topics will vary from year to year. The following are given as examples: economic goals and effects of unions; labour mobility; labour force participation; wage differentials; discrimination; unemployment.
3 hrs.; one term
Prerequisite: Economics 3D03, and Economics 2B03 or 3O06.

ECON 3H03 INTERNATIONAL MONETARY ECONOMICS
Balance of payments and economic problems of an open economy with special reference to Canada; the international financial system and proposals for its reform.
3 hrs. (lects. and seminars); one term
Prerequisite: Economics 2H03 or 2M06, and registration in any programme in Economics; or permission of the instructor.

ECON 3HH3 INTERNATIONAL TRADE
Real theory of international trade; interregional and international specialization; effect of commercial and industrial policies.
3 hrs.; one term
Prerequisite: Economics 2G03 or 2L06, and registration in any programme in Economics; or permission of the instructor.

ECON 3I03 ECONOMIC HISTORY OF THE UNITED STATES
Economic analysis of the development of the U.S. economy. Topics include the colonial economy, slavery, transportation, income distribution, foreign trade, technical and institutional change and the Great Depression.
3 lects.; one term
Prerequisite: Economics 2G03 or 2L06; or permission of the instructor. Economics 2H03 or 2M06 is recommended.

ECON 3J06 ECONOMIC DEVELOPMENT
Analysis of economies of less developed countries. Topics include structural change, dual economies, agriculture, population, savings, financial development, income distribution, trade and policy.
3 hrs.; two terms
Prerequisite: Economics 2G03 or 2L06, and Economics 2H03 or 2M06.

ECON 3K03 MONETARY ECONOMICS AND FINANCIAL ORGANIZATION: THEORY AND POLICY
Objectives, organization and operation of the financial sector; financial intermediaries in the capital market; mechanism of international payments; monetary theory and policy concerning Canadian allocative and stability objectives.
3 hrs.; one term
Prerequisite: Economics 2G03 or 2L06, and Economics 2H03 or 2M06.

ECON 3L03 MARXIAN ECONOMICS
An examination of the foundations of Marxist economic thought; Marxism as a theory of the capitalist system; the place of Marxian doctrine in contemporary economic analysis.
3 lects.; one term
Prerequisite: Economics 2G03 or 2L06.

ECON 3LL3 HISTORY OF ECONOMIC THEORY
Economic thought from earliest times, with emphasis on the major schools from Adam Smith to Alfred Marshall, selected modern trends and controversies.
3 hrs.; one term
Prerequisite: Economics 2G03 or 2L06; Economics 2H03 or 2M06. Not open to students with credit in Economics 4C06.

ECON 3N06 INDUSTRIAL ORGANIZATION AND PUBLIC POLICY
The structure, conduct and performance of industrial markets, with emphasis upon the problems and methods of maintaining effective competition.
3 hrs.; two terms
Prerequisite: Economics 2G03 or 2L06.
A student who has credit for Economics 3S03 may receive only 3 additional units of credit for Economics 3N06.

ECON 3O06 ECONOMIC STATISTICS
Statistical analysis as a basic research technique in economics, emphasizing estimation and statistical inferences, including linear regression models. Applications are drawn from micro and macroeconomics.
3 lects.; two terms
Prerequisite: Economics 2G03 or 2L06, and Economics 2H03 or 2M06. Not open to students with credit or concurrent registration in Statistics 3D06.
Students with credit in any of Economics 2B03, Chemical Engineering 4C03, Commerce 2QA3, Geography 2L03, Political Science 3G03 or 3H03, Psychology 2G03 or 2R06, Sociology 2Y03 or 3H06, or any Statistics courses other than Statistics 2D03, may receive only 3 additional units for Economics 3O06.

ECON 3R03 THE INTERNATIONAL ECONOMY SINCE 1945
International finance, commercial policy, changing national and industrial structures and relations between development and the developing countries.
3 hrs.; one term
Prerequisite: At least C− in Economics 1A06.

ECON 3S03 INDUSTRIAL ORGANIZATION
A study of the structure, conduct and performance of industrial markets.
3 lect.; one term
Prerequisite: Economics 2G03 or 2L06. Not open to students receiving credit for Economics 3N06.

ECON 3U03 ANALYSIS OF ECONOMIC DATA II
Elaboration of regression techniques developed in Economics 2B03. Problems of inference and interpretation in the analysis of economic data. Introduction to forecasting in economics.
3 hrs.; one term
Prerequisite: Economics 2G03 or 2L06, and Economics 2H03 or 2M06, and Economics 2B03 or permission of the instructor. Not open to students with credit or concurrent registration in Economics 4G03.

ECON 3V03 PUBLIC CHOICE AND BENEFIT-COST ANALYSIS
The economics of social decision-making; the logic of group decision and the political process; welfare economics; theory and application of benefit-cost analysis.
3 hrs. (lects. and seminars); one term
Prerequisite: Economics 2G03 or 2L06.

ECON 3W03 NATURAL RESOURCES
Competitive and socially optimal exhaustion of nonrenewable resources; market failure as illustrated by mineral cartels, fisheries and forestry; Canadian energy policy.
3 hrs. (lects. and seminars); one term
Prerequisite: Economics 2G03 or 2L06, and Mathematics 1M03; or permission of the instructor.

ECON 3X03 SELECTED TOPICS I
Topics will vary from year to year depending on student interests and faculty availability. Students should consult the Department on topics to be offered.
3 hrs.; one term
Prerequisite: Permission of the Department.
This course may be repeated if on a different topic.

ECON 3Y03 SELECTED TOPICS II
As for Economics 3X03.
3 hrs.; one term
Prerequisite: Permission of the Department.

ECON 3Z03 HEALTH ECONOMICS
Analysis of allocation of resources in health care. Topics include markets for health care, insurance, biomedical research, technology assessment, organization and public policy.
3 hrs.; one term
Prerequisite: Economics 2G03 or 2L06. Economics 2B03 or another course in statistics is recommended.

ECON 4E03 TOPICS IN MICROECONOMICS
Applications of advanced microeconomic theory.
3 hrs.; one term
Prerequisite: At least C− in Economics 3A03.

ECON 4F03 TOPICS IN MACROECONOMICS
Applications of advanced macroeconomic theory.
3 hrs.; one term
Prerequisite: At least C− in Economics 3AA3.

ECON 4G03 ECONOMETRICS I
Development of regression models appropriate to economics. Illustrations from applied micro- and macroeconomics.
3 hrs.; one term
Prerequisite: Economics 2G03 or 2L06, and Economics 2H03 or 2M06, and at least C− in Economics 3O06 or Statistics 3D06; or permission or the instructor.

ECON 4GG3 ECONOMETRICS II
Special topics in econometrics, including identification in simultaneous equations models in micro- and macroeconomics and topics in the analysis of time series.
3 hrs.; one term
Prerequisite: Economics 4G03.

ECON 4H03 LINEAR ECONOMIC MODELS
Application and interpretation in economics of linear programming, game theory, and inter-industry analysis.
3 lects.; one term
Prerequisite: At least C− in each of Mathematics 1L03, 1M03, Economics 2G03 or 2L06, and Economics 2H03 or 2M06; or permission of the instructor. Credit in Mathematics 1A06 is accepted in place of C− in Mathematics 1M03.

ECON 4M06** DIRECTED RESEARCH I
A reading and/or research programme supervised by a Department member. A major paper is required. Students should consult the Department concerning admission.
Prerequisite: Permission of the Department.

ECON 4N03** DIRECTED RESEARCH II
As for Economics 4M06.
Prerequisite: Permission of the Department.

For **Graduate courses**, see the *Calendar of the School of Graduate Studies.*

Eighteenth-Century Studies

There is no B.A. programme in *Eighteenth-Century Studies*, but students wishing to make a special study of the field may group electives from the following list of relevant courses offered by various departments. For a full description and requirements see the appropriate departmental listings. For information on year offered see the timetable.

Art History 2N03	Italian Baroque Art and Architecture
English 2R03	Topics in Restoration and 18th-Century Literature
English 4B06	English Literature 1660-1800

English 4L03	Romantic Poetry
French 3K03	Eighteenth-Century French Literature I
French 3KK3	Eighteenth-Century French Literature
French 4F03	Topics in Eighteenth-Century French Literature
German 3A03	Baroque and Enlightenment Literature
History 2M06	European Society from Absolutism to Democracy
History 2N06	British History 1500 to the Present
History 4F06	Special Topics in the Age of the Enlightenment
Philosophy 3A06	From Kant to Hegel

Electrical and Computer Engineering

Faculty as of January 15, 1989

K.M. Wong/*Chairman*

Professors Emeriti

Colin D. diCenzo/CM, CD, M.Sc.E.E. *(New Brunswick)*, D.I.C. *(Imperial College, London)*, F.E.I.C., F.I.E.E.E., V.I.E. *(Australia)*, P.Eng.
Arthur S. Gladwin/D.Sc. *(Glasgow)*, Ph.D. *(London)*
Reuven Kitai/M.Sc., D.Sc. *(Witwatersrand)*, F.I.E.E.

Professors

Robert T.H. Alden/B.A.Sc., M.A.Sc., Ph.D. *(Toronto)*, P.Eng.
John W. Bandler/B.Sc. (Eng.), Ph.D., D.Sc. (Eng.) *(London)*, A.C.G.I., D.I.C. *(Imperial College)*, C.Eng., F.R.S.C., F.I.E.E., F.I.E.E.E., P.Eng.
Colin K. Campbell/B.Sc. (Eng.), Ph.D. *(St. Andrews)*, D.Sc. *(Dundee)*, S.M. *(M.I.T.)*, F.R.S.C., F.R.S.A., F.E.I.C., F.I.E.E.E., P.Eng.
Charles R. Carter/B.A.Sc., M.A.Sc., *(British Columbia)*, Ph.D. *(McMaster)*, P.Eng. David R. Conn/B.Sc., M.Sc., Ph.D. *(Queen's)*, NSERC Industrial Research Chair in Monolithic Microwave Integrated Circuits.
Raymond D. Findlay/B.A.Sc., M.A.Sc., Ph.D. *(Toronto)*, P.Eng.
Simon Haykin/B.Sc., Ph.D., D.Sc. *(Birmingham)*, F.R.S.C., F.I.E.E.E.
John Litva/B.Sc. *(British Columbia)*, M.Sc., Ph.D. *(Western Ontario)*/ NSERC Industrial Research Chair in Communication Antennas
Barna Szabados/Dipl.Eng. *(Grenoble)*, M.Eng., Ph.D. *(McMaster)*, P.Eng.
Naresh K. Sinha/B.Sc. (Eng.) *(Banaras)*, C.Eng., Ph.D. *(Manchester)*, F.I.E.E., P.Eng.
Desmond P. Taylor/B.Sc., M.Sc. *(Queen's)*, Ph.D. *(McMaster)*, F.E.I.C., P.Eng.
Kon Max Wong/B.Sc. (Eng.), Ph.D., D.I.C. *(Imperial College, London)*, C.Eng., F.I.E.E., F.S.S.

Associate Professors

Stephen H. Chisholm/B.A.Sc. *(Toronto)*, Ph.D. *(London)*
Mohamed A. El-Kady/M.Sc. (Eng.) *(Cairo)*, Ph.D. *(McMaster)*, P.Eng./ part-time
Chandra M. Kudsia/B.Sc. *(Delhi)*, B.E. *(Bangalore)*, M.Eng. *(McMaster)*, Ph.D. *(Concordia)*, P.Eng./part-time
James P. Reilly/B.A.Sc. *(Waterloo)*, M.Eng., Ph.D. *(McMaster)*, P.Eng.
Graham J. Rogers/B.Sc. *(Southampton)*/part-time

Assistant Professors

Radek M. Biernacki/M.Sc., Ph.D. *(Warsaw)*/part-time
David W. Capson/B.Sc.Eng. *(New Brunswick)*, M.Eng., Ph.D. *(McMaster)*, P.Eng.
Youssef H. Dableh/B.Sc.Eng., M.Sc.Eng. (New Brunswick), Ph.D. *(McMaster)*, P.Eng/part-time
Daniel C. McCrackin/B.Eng., M.Eng., Ph.D. *(McMaster)*
Peter M. Smith/B.Eng.Mgt., M.Eng., Ph.D. *(McMaster)*
Terence D. Todd/B.A.Sc., M.A.Sc., Ph.D. *(Waterloo)*
Carl F. Weaver/B.A.Sc. *(Waterloo)*, M.Eng., Ph.D. *(McMaster)*, P.Eng.

Associate Members

J.S. Chang/M.Eng., B. Eng., B.Edu.Eng. *(Japan)*, Ph.D. *(York)*
Hubert deBruin/M.Eng., Ph.D. *(McMaster)*, P.Eng.
Gopal Madhavan/B.Sc.Eng. *(Calicut)*, M.S. *(I.I.T. Madras)*, Ph.D. *(McMaster)*
W.F. Skipper Poehlman/B.S. *(Niagara)*. B.Sc. *(Brock)*, M.Sc., Ph.D. *(McMaster)*

COMPUTER ENGINEERING

COMP ENG 2HA3 DIGITAL CIRCUITS
Number systems; Boolean algebra, switches, logic gates, simplification of Boolean functions, combinational logic, flipflops, analysis and design of clocked sequential circuits.
2 lects., 1 lab. or tut. (3); second term
Prerequisite: Registration in a programme in Computer or Electrical Engineering. Not open to students with credit in Electrical Engineering 2H03.

COMP ENG 2KA3 COMPUTATIONAL METHODS I
Computational techniques for solving electrical engineering problems; linear and non-linear equations; eigen decompositions; numerical integration, differentiation; differential equations; interpolation; numerical stability and computational efficiency.
2 lects., 1 lab. or tut. (3); second term
Prerequisite: Engineering 1D04, Mathematics 1H05, 1N06, and registration or credit in Electrical Engineering 2BA3.

COMP ENG 2YA4 ALOGORITHMS AND DATA STRUCTURES
Design of structured programs; top-down methods; data structure operations and applications; parsing; searching; pattern matching; sorting.
3 lects, 1 lab. (3); first term
Prerequisite: Engineering 1D04, and registration in a Computer Engineering programme.

COMP ENG 3HB3 DIGITAL COMPUTER PRINCIPLES
Elements of digital computers; register transfer logic; memory; operation, organization and control of central processor unit.
2 lects., 1 lab. or tut. (3); first term
Prerequisite: Computer Engineering 2HA3.

COMP ENG 3KB3 COMPUTATIONAL METHODS II
Large-scale network analysis; formulation of equations and their solution; introduction to optimization.
2 lects., 1 lab. or tut. (3); second term
Prerequisite: Computer Engineering 2KA3 and Electrical Engineering 2DA3.

COMP ENG 3VA3 SOFTWARE ENGINEERING
Software life-cycle; planning; requirements analysis; the design process and methods; design tools; testing; maintenance; software reliability. Application of design methods in a group project.
2 lects., 1 lab. or tut. (3); second term
Prerequisite: Computer Engineering 2YA4 or Computer Science 2B03 and 2L03, and registration in a Computer Engineering programme.

COMP ENG 3WA3 OPERATING SYSTEM DESIGN
Systematic design and implementation of operating systems: synchronization of concurrent processes, resource sharing and protection, file systems, memory management and virtual memory.
2 lects., 1 lab. or tut. (3); first term
Prerequisite: Computer Engineering 2YA4 or Computer Science 2B03 and 2L03, and registration in a Computer Engineering programme.

COMP ENG 4HC3 MICROPROCESSOR SYSTEMS
Microprocessor architecture, programming, timing, memory interfacing and interrupt handling using 8086; peripheral interfaces including handshaking, PPI, UART, keyboards, CRT, timers and event counters; system bus structures.
2 lects., 1 lab. or tut. (3); first term
Prerequisite: Computer Engineering 3HB3. Not open to students with credit in Electrical Engineering 4S04.

COMP ENG 4HD3 ADVANCED COMPUTER DESIGN
Advanced topics in computer design: processor control; I/O implementation; processor and memory acceleration; instruction set design for high level languages; virtual machines; multiprocessing.
2 lects., 1 lab. or tut. (3); second term
Prerequisite: Computer Engineering 3HB3. Not open to students with credit in Electrical Engineering 4T04.

COM ENG 4HE3 ADVANCED REAL TIME COMPUTING SYSTEMS
Real time systems, jobs and tasks; disk management; real time implementation; multiprocessor systems.
2 lects., 1 lab. or tut. (3); second term
Prerequisite: Computer Engineering 3HB3.

COMP ENG 4JA4 THESIS PROJECT
An experimental investigation or design project to be carried out by the student, to test initiative, grasp of the subject and capacity for independent work.
2 labs. (3); both terms
Prerequisite: Registration in Level IV of Computer Engineering or Level V of Computer Engineering and Management. Not open to students with credit in Electrical Engineering 4J04.

COMP ENG 4KC3 SIMULATION AND OPTIMIZATION
Analog IC and system simulation; advanced optimization techniques; design centering, tolerancing and tuning; use of professional CAD software; VLSI and MMIC applications.
2 lects., 1 lab or tut. (3); first term
Prerequisite: Computer Engineering 3KB3. Not open to students with credit in Electrical Engineering 4K04.

COMP ENG 4MA3 COMPUTER COMMUNICATION NETWORKS
Modem communication networks; switching methods; open systems interconnection architecture; design of communication subnetworks; local and metropolitan area networks; communication protocols; Fiberoptic systems; integrated services digital networks.
2 lects., 1 lab. or tut. (3); first term
Prerequisite: Electrical Engineering 3AA3. Not open to students with credit in Electrical Engineering 4D04.

ELECTRICAL ENGINEERING

ELEC ENG 2BA3 ELECTRICAL SCIENCE
Electrostatic fields; Coulomb's Law, electric flux, potential; capacitance; conductors and dielectrics, polarization; magnetic fields; magnetic flux, magnetic circuits, forces and torques; energy concepts; inductance.
2 lects., 1 lab. or tut. (3); first term
Prerequisite: Mathematics 1H05, Physics 1E04 or 1E03, and registration in a programme in Computer Engineering or Electrical Engineering. Not open to students with credit in Electrical Engineering 2B04.

ELEC ENG 2DA3 CIRCUITS AND SYSTEMS I
Mesh and nodal analysis of networks; transient response; steady-state response for sinusoidal inputs using phasors; power in AC circuits; network theorems; dependent sources; transformers; polyphase circuits.
2 lects., 1 lab. or tut. (3); second term
Prerequisite: Registration or credit in Electrical Engineering 2BA3.

ELEC ENG 2FA3 DEVICES AND CIRCUITS I
Non-linear circuits; dependent sources; circuit models; applications; physical electronics of semiconductor diodes, bipolar junction transistors and field effect transistors, operational amplifiers; integrated circuit technology.
2 lects., 1 lab. or tut. (3); second term
Prerequisite: Registration or credit in Electrical Engineering 2BA3 and 2DA3.

ELEC ENG 3AA3 TELECOMMUNICATIONS SYSTEMS I
Introduction to modem communication systems; data networks, protocol architectures, switching methods, physical communications, amplitude modulation, angle modulation, generation of AM and FM, digital modulation.
2 lects., 1 lab. or tut. (3); second term
Prerequisite: Registration or credit in Electrical Engineering 3DB3 or credit in Electrical Engineering 3B04.

ELEC ENG 3BB3 ELECTROMAGNETIC FIELDS AND WAVES
Scalar and vector potential fields; Maxwell's equations, boundary conditions, electromagnetic energy and Poynting's theorem, transmission lines; waves.
2 lects., 1 lab. or tut. (3); first term
Prerequisite: Electrical Engineering 2BA3. Not open to students with credit in Electrical Engineering 3C04.

ELEC ENG 3CA3 FEEDBACK CONTROL SYSTEMS I
Models of physical systems: transfer functions and block diagrams, characteristics of feedback systems, frequency response, Nyquist criterion for stability.
2 lects., 1 lab. or tut. (3); second term
Prerequisite: Electrical Engineering 2DA3 and registration or credit in Electrical Engineering 3DB3.

ELEC ENG 3DB3 CIRCUITS AND SYSTEMS II
Introduction to discrete time signals and systems: z-transforms, discrete and continuous time convolution, frequency response in discrete time systems, Fourier series, Fourier transforms, two-port networks.
2 lects., 1 lab. or tut. (3); first term
Prerequisite: Electrical Engineering 2DA3 and Computer Engineering 2KA3.

ELEC ENG 3FB3 ELECTRONIC DEVICES AND CIRCUITS II
Advanced treatment of diode and transistor physical electronics, circuit models and characteristics; multi-transistor amplifiers and circuits; frequency response; feedback; computer simulation of electronic circuits.
2 lects., 1 lab. or tut. (3); first term
Prerequisite: Electrical Engineering 2DA3 and 2FA3, and registration or credit in Electrical Engineering 3CA3 and 3DB3.

ELEC ENG 3FC3 ELECTRONIC DEVICES AND CIRCUITS III
Linear and non-linear operational amplifier circuits; signal generators; active filters; power amplifiers; regulators; digital electronics; A/D and D/A conversion; multiplexors, sample and hold.
2 lects., 1 lab. or tut. (3); second term
Prerequisite: Registration or credit in Electrical Engineering 3FB3.

ELEC ENG 3NA3 AC POWER CONCEPTS
Polyphase circuits; transformers; voltage control and regulation; introduction to polyphase machines; synchronous generators and motors, squirrel-cage induction motors; applications to small industrial plants.
2 lects., 1 lab. or tut. (3); first term
Prerequisite: Electrical Engineering 2BA3 and 2DA3.

ELEC ENG 3SA3 SMALL MOTORS AND DRIVES
Small motors; direct current, single-phase induction, wound rotor induction, hysteresis, universal, stepper and permanent magnet motors. Elementary speed control techniques.
2 lects., 1 lab. or tut. (3); second term
Prerequisite: Registration or credit in Electrical Engineering 3NA3.

ELEC ENG 4AB3 COMMUNICATION SYSTEMS II
Communication systems in noisy and imperfect channels; random processes; Shannon-Hartley channel capacity law; noise in CW modulation systems including AM, DSBSC and SSB; digital systems, line codes, multiplexing; technology issues.
2 lects., 1 lab. or tut. (3); first term
Prerequisite: Electrical Engineering 3AA3, 3BB3 and Statistics 3X03.

ELEC ENG 4AC3 DIGITAL COMMUNICATIONS
Fundamental limits on performance; detection and estimation; digital modulation techniques; error control coding.
2 lects., 1 lab. or tut. (3); second term
Prerequisite: Electrical Engineering 3AA3 and Mathematics 3K03. Not open to students with credit in Electrical Engineering 4G04.

ELEC ENG 4CB3 FEEDBACK CONTROL SYSTEMS II
Design and compensation of control systems using frequency response as well as s-plane methods; Controllability and observability; state variable feed back; asymptotic observers; design of digital control systems; nonlinear systems analysis.
2 lects., 1 lab. or tut. (3); first term
Prerequisite: Electrical Engineering 3CA3.

ELEC ENG 4EA3 DIGITAL SIGNAL PROCESSING
Discrete time systems; z-transforms; Fourier transforms; digital filters; effects of finite register length; least squares filters; matched filters.
2 lects., 1 lab. or tut. (3); second term
Prerequisite: Electrical Engineering 3DB3. Not open to students with credit in Electrical Engineering 4V03.

ELEC ENG 4FD3 ELECTRONICS IV
Selected advanced topics in physical electronics of semiconductor devices; integrated circuit fabrication technology; integrated circuit component design; analog integrated circuits; computer aids to design.
2 lects., 1 lab. or tut. (3); second term
Prerequisite: Electrical Engineering 3FC3. Not open to students with credit in Electrical Engineering 4P04.

ELEC ENG 4JA4 THESIS PROJECT
An experimental investigation or design project to be carried out by the student, to test initiative, grasp of the subject, and capacity for independent work.
2 labs. (3); both terms
Prerequisite: Registration in Level IV of Electrical Engineering or Level V of Electrical Engineering and Management. Not open to students with credit in Electrical Engineering 4J04.

ELEC ENG 4LA3 FILTER THEORY AND DESIGN
Network functions; Butterworth, Chebyshev and elliptic filters; frequency transformations for low pass, bandpass and band reject passive filter synthesis; RC active filters; digital filters; surface acoustic wave filters.
2 lects., 1 lab. or tut. (3); second term
Prerequisite: Electrical Engineering 3BB3. Not open to students with credit in Electrical Engineering 4L04.
Not offered in 1989-90.

ELEC ENG 4NB3 POWER TRANSMISSION AND DISTRIBUTION
Transmission lines and cables; transformers and distribution stations; power flow control; voltage control; generation system economics; simulations.
2 lects., 1 lab. or tut. (3); second term
Prerequisite: Electrical Engineering 3BB3 and 3NA3. Not open to students with credit in Electrical Engineering 4N04.

ELEC ENG 4QA3 TECHNICAL WRITING AND ORAL COMMUNICATION
Writing for, and speaking to, technical and management audiences: resumes, letters of inquiry, technical correspondence, technical description and definition; writing intructions; preparing audiovisual aids.
1 lect., 1 seminar, 1 tut. (3); first term
Prerequisite: Registration in Level IV of Computer Engineering or Electrical Engineering.

ELEC ENG 4RA3 TRANSMITTING AND RADIATING SYSTEMS
Principles of transmission lines, matching and Smith charts; waveguides and resonant cavities; antenna radiation; dipole antennas; antenna arrays.
2 lects., 1 lab. or tut. (3); first term
Prerequisite: Electrical Engineering 3BB3. Not open to students with credit in Electrical Engineering 4B04 or 4R04.

ELEC ENG 4SB3 POWER ELECTRONICS
Power circuits with switches; basic rectifier circuits; commutation; trijunctions; inverters; choppers; inverter control.
2 lects., 1 lab. or tut. (3); first term
Prerequisite: Electrical Engineering 3FB3. Not open to students with credit in Electrical Engineering 4F04.

ELEC ENG 4UA3 BIOMEDICAL ELECTRONIC INSTRUMENTATION
Generation and nature of bioelectric potentials; electrodes and other transducers; principles of instrumentation; electrical safety; neuromuscular and cardiovascular instrumentation; ultrasonics and other medical imaging.
2 lects., 1 lab. or tut. (3); second term
Prerequisite: Electrical Engineering 3FB3 or Engineering 3N03 or Physics 3B06. Not open to students with credit in Electrical Engineering 4U04.

For **Graduate courses**, see the *Calendar of the School of Graduate Studies.*

Engineering (General)

Department Note:

Enrolment in these courses by students in programmes other than Engineering or Engineering and Management may be limited.

ENGINEER 1C04 ENGINEERING DESIGN AND COMMUNICATION

Graphical, written and oral communcation in the context of engineering design. The engineer and society. Design projects by individuals and groups, design skills workshops.

2 lects., 1 lab. (3), 1 lab. (2); first term

Prerequisite: Registration in an Engineering programme.

ENGINEER 1D04 ENGINEERING COMPUTATION

Problem solving using computational techniques. The development of algorithms and their application using a structured computer language to solve problems in analysis, design and elementary optimization. Software packages.

3 lects., 1 tut. (2); second term

Prerequisite: Registration in an Engineering programme.

ENGINEER 2C03 ELECTRICAL CIRCUITS AND MEASUREMENTS

Electrical quantities and circuit elements, Kirchhoff's laws and network theory, transient response of circuits, simple measurement devices and transducers, characteristics of motors.

2 lects., 1 lab. or tut.; first term

Prerequisite: Physics 1E03, and registration in Mathematics 2M06, or 2P04 and 2Q04.

ENGINEER 2M04 ELECTRICAL SCIENCE

An introduction to electricity and magnetism covering electrostatics, electric currents, magnetism and electromagnetism, with applications in circuits and elementary devices.

3 lects., 1 lab. or tut.; first and second terms

Prerequisite: Physics 1E03, and registration in Mathematics 2M06, or 2P04 and 2Q04.

ENGINEER 2O03 STRUCTURE AND PROPERTIES OF ENGINEERING MATERIALS

The relationships between the structure of solids and their properties are developed by study of specific mechanical, electrical, magnetic and chemical properties, along with the various levels of structural complexity exhibited by solid materials. Student independent study is aided by audio-visual materials and regular tutorial assistance.

Self-paced study; first term

Prerequisite: Completion of at least 12 units of Level I Chemistry, Mathematics or Physics. Not open to students who have credit or are registered in Materials 1A03 and/or 1B03.

ENGINEER 2P04 ENGINEERING MECHANICS 'A'

Principles of statics as applied to deformable solid bodies. Stress and strain, elastic and inelastic behaviour of simple members under axial force, bending and torsion. Deflection of beams; statical indeterminacy.

3 lects., plus one unit comprising tutorials or lectures devoted to applications, at the discretion of the instructor; first term

Prerequisite: Physics 1D03.

ENGINEER 2Q04 ENGINEERING MECHANICS 'B'

Kinematics and dynamics of particles and rigid bodies. Motion with respect to a rotating frame of reference. Work, energy and momentum principles. Free, damped and forced vibrations of single degree of freedom systems.

3 lects., plus one unit comprising tutorials or lectures devoted to applications, at the discretion of the instructor; second term

Prerequisite: Credit or registration in Engineering 2P04.

ENGINEER 2R04 BASIC ENGINEERING MECHANICS

Statics: equivalent force systems, equilibrium of particles and rigid bodies. Deformable body mechanics: stress, strain, deformation of members. Dynamics: work, energy and momentum; dynamics of particles and planar motion of rigid bodies.

2 lects.; both terms

Prerequisite: Physics 1D03.

ENGINEER 2S03 MECHANICS FOR ELECTRICAL AND COMPUTER ENGINEERING

Three dimensional statics. Equivalent force systems in statics and dynamics. Three dimensional and planar kinematics. Principles of mechanics: momenta, work and energy. Dynamics of particles and planar motion of solid bodies.

3 lects.; first term

Prerequisite: Physics 1D03 and registration in any programme in Computer Engineering or Electrical Engineering.

ENGINEER 2W04 ENGINEERING THERMODYNAMICS

An introduction to the principles of thermodynamics and their application to engineering.

3 lects., 1 tut.; second term

Prerequisite: Chemistry 1A06 or 1E03 and credit or registration in Mathematics 2M06, or 2P04 and 2Q04.

ENGINEER 3M03 ELECTRICAL CIRCUITS AND POWER

Fundamentals of electromechanical energy conversion. Motors and generators, transformers, single and polyphase power circuits, synchronous and induction machines, power measurements.

2 lects. and 1 lab. or tut.; first term

Prerequisite: Engineering 2M04.

ENGINEER 3N03 ELECTRONICS AND INSTRUMENTATION

Semiconductor devices; diodes, transistors and silicon-controlled rectifiers. Transistor characteristic and load lines. Amplifier circuits with and without feedback. Rectifier and filter circuits. Positive and negative feedback, with application to oscillators and amplifiers. Operational amplifiers. Analogue computers. Digital circuits and digital logic. Digital counter and timer circuits.

2 lects., 1 tut. (2) or 1 lab. (3); second term

Prerequisite: Engineering 2M04.

ENGINEER 3P03 MECHANICAL BEHAVIOUR OF MATERIALS

Phenomenological treatment of elastic and plastic deformation, creep, fatigue and fracture; mechanics of engineering materials. Physical processes in metals, ceramics, polymers, concrete, wood and composite materials. Application to mechanical design of structures, welded components and materials selection decisions. Test methods, including non-destructive inspection.

3 lects.; second term

Prerequisite: Mathematics 2M06 or 2P04 and 2Q04, and Engineering 2P04 or 2R04. Not open to students with credit in Materials 3P03.

ENGINEER 3Q03 ELECTRONIC PROPERTIES OF SOLIDS

A conceptual and quantitative study of how electronic properties of solids are based upon microscopic theory. Basic quantum mechanics used as a tool to explain electronic, magnetic and dielectric behaviour of metals, insulators and semiconductors.

3 lects.; first term

Prerequisite: Engineering Physics 2A03, or Engineering 2M04, or Electrical Engineering 2BA3, or Physics 2B06.

ENGINEER 3R03 PROPERTIES AND SELECTION OF ENGINEERING MATERIALS

Properties of engineering materials are related to production and fabrication methods and resultant microstructures. Materials processing, fabrication and selection in engineering design.

3 lects.

Prerequisite: Engineering 2O03. Not open to students registered in a programme administered by the Department of Materials Science and Engineering.

Offered in alternate years.

ENGINEER 4A03 TECHNOLOGY AND SOCIETY

Models of the technology-society relationship and the culture of technology. The control of technology with special emphasis on the role of the engineering profession.

1 lect., 1 tut., 1 seminar; second term

Prerequisite: Registration in Level III or above in any programme in the Faculty of Engineering.

ENGINEER 4B03 ENGINEERING ECONOMICS

Engineering criteria for decision-making. Money flow. Financial ventures. Personal financing. Total project investment. Production and operations costs. Economic analysis. Financial attractiveness.

2 lects., 1 tut.; second term

Prerequisite: Registration in Level IV of an Engineering programme. Not open to students registered in, or having credit for, Chemical Engineering 4N04. Not open to students registered in Engineering and Management programmes.

ENGINEER 4C03 REAL-TIME COMPUTER INTERFACING

Organization of real-time computers; instrumentation and interfacing for data acquisition and control; computer communication and local area networks; diagnostics for real-time operations.

2 lects., 1 lab. (3); first term

Prerequisite: Registration in Level IV of Manufacturing Engineering or Level V of Civil Engineering and Computer Systems. Not open to students with credit or registration in any of Computer Engineering 3HB3, Electrical Engineering 3H03, Physics 4D06.

ENGINEER 4H03 ENGINEERING: ITS HISTORY, PHILOSOPHY AND INFLUENCE ON CIVILIZATION

History and philosophy of engineering from antiquity to modern times, with special emphasis on scientific technology. Cultural significance of engineering to civilization. Nature and problems of industrial technology. Benefits and risks of technological progress. Engineering as a learned profession.

2 lects., 1 tut. (2); second term

Prerequisite: Registration in Level III, IV, or V of any Engineering programme. Not open to students with credit in Civil Engineering 4J03.

ENGINEER 4J03 METAL FORMING

Offered jointly by the Departments of Mechanical Engineering and Materials Science and Engineering. Engineering plasticity applied to rolling, forging, extrusion, wire drawing and sheet metal forming. The role of processing on the optimization of mechanical properties and the design of metal forming processes are discussed together with future developments in the fabrication of both metallic and nonmetallic materials.

3 lects.; second term

Prerequisite: Engineering 2O03, and Mechanical Engineering 3A03 or Engineering 3P03 or Materials 3P03.

ENGINEER 4U03 UNIT OPERATIONS AND PROCESSES IN ENVIRONMENTAL ENGINEERING

Offered jointly by the Departments of Chemical Engineering and Civil Engineering and Engineering Mechanics. The process capabilities, hardware and design equations, of the physical, chemical and biological processes used to improve water. Emphasis on processes such as bio-oxidation, clarification, coagulation, sludge dewaterings and disinfection.

2 lects., 1 tut. (2); first term

Prerequisite: Chemical Engineering 2O04, or Civil Engineering 3O04, or Mechanical Engineering 3O04, and registration in Level IV or above of any Engineering programme.

ENGINEER 4X03 CONCEPTS IN BIOMEDICAL ENGINEERING

Engineering and physical science approach to human physiological systems; cardiovascular system, with specific organ circulations, respiratory systems, overall integration and control.

3 lects.; first term

Prerequisite: Registration in Level III or above of any programme in the Faculty of Engineering or any Honours or Major programme in the Faculty of Science.

Engineering and Management

The Engineering and Management Programmes are described in the section *Faculty of Engineering* in this Calendar. These programmes are administered jointly by the Faculties of Business and of Engineering and lead to the B.Eng.Mgt. degree. An Industrial Advisory Council also participates in the education process.

Faculty on the Operating Committee, as of January 15, 1989:

D.R. Woods/*Programme Director*
P.L. Abad (Business)
N.C. Agarwal (Associate Dean, Academic Programmes - Business)
R.T.H. Alden (Electrical and Computer Engineering)
E.A. Ballik (Engineering Physics)
M. Basadur (Faculty of Business)
J.L. Brash (Chemical Engineering)
K.R. Deal (Business)
R. Deaves (Faculty of Business)
M.A. Dokainish (Associate Dean, Academic Programmes - Engineering)
A.C. Heidebrecht (Dean of Engineering)
D.A.R. Kay (Materials Science and Engineering)
B. Latto (Mechanical Engineering)
D. Stolle (Civil Engineering and Engineering Mechanics)
G.W. Torrance (Dean of Business)

Industrial Advisory Council Members 1988-89

M. Anyas-Weiss (Ontario Hydro)
S. Bhan (Acres International Limited)
F.M. Edgell (Consultant)
W. Filer (Filer Consultants, Ltd.)
G.J. Hoolboom (Westinghouse Canada Inc.)
R.G. Keen (Steltech)
D. Ledingham (Shell Canada Products Ltd.)
C. Loney (Consultant)/*Chairman*
M. Premovic (Carrier Canada Limited)
R.L. Reycraft (Procter & Gamble)
G. Schneider (Hodgson Steel Inc.)
R.B.V. Simmons (Consultant)
H. Sonnenberg (Xerox Research Centre of Canada)
R. Tomiuck (Tridon Environmental)
J. Vice (Northern Telecom Canada Ltd.)
K. Wilson (Polysar Ltd.)

ENGN MGT 2A01 ENGINEERING AND MANAGEMENT SEMINAR I

Discussion and lectures on issues important to the Engineering and Management programmes, such as communication skills, self assessment, career planning and job applications.

1 seminar, alternate weeks; both terms

Prerequisite: Registration in Level II of any Engineering and Management programme.

ENGN MGT 3A01 ENGINEERING AND MANAGEMENT SEMINAR II

Discussion and lectures on issues important to the Engineering and Management programmes, such as communication skills, interpersonal skills, group skills, the effect of law and the environment on management functions.

1 seminar, alternate weeks; both terms

Prerequisite: Engineering and Management 2A01.

ENGN MGT 4A01 ENGINEERING AND MANAGEMENT REPORT

Communication, leadership, intrapreneurial and entrepreneurial skills, supervision, project management and contracts. A written report and oral presentation based on summer work experience and/or career development are required. Guidelines and procedures must be obtained from the Programme Director before the end of Level III.

1 seminar, alternate weeks; two terms

Prerequisite: Registration in Level IV of an Engineering and Management programme.

ENGN MGT 4G01 PROBLEM SOLVING, DECISION MAKING AND INTERPERSONAL SKILLS

An intensive workshop, involving such topics as: awareness of the thinking process, strategies, creativity, decision-making, criteria selection, self-performance evaluation, group skills, listening. Grade of 'complete' for satisfactory performance.

Intensive residential course offered each May; 5 days, 8 hours per day.

Prerequisite: Completion of Level III of an Engineering and Management programme, including Commerce 2BA3.

ENGN MGT 5A01 ENGINEERING AND MANAGEMENT REPORT

Report on a topic related to career development is required of each student in an Engineering and Management programme; guidelines and evaluation procedures must be obtained from the Programme Director before the end of Level IV.

Prerequisite: Registration in Level V of an Engineering and Management programme.

ENGN MGT 5B03 ENGINEERING AND MANAGEMENT PROJECTS

Projects that integrate the engineering and business disciplines, employing case studies provided by the members of the Industrial Advisory Council, or by industry.

1 lect., 2 tuts. (2); first or second term

Prerequisite: Registration in Level V of an Engineering and Management programme.

ENGN MGT 5G01 TRAINING AND PROBLEM SOLVING

An intensive workshop, involving such topics as: supervision and the principle of training; practicum. Students supervise workshops in the course, Engineering and Management 4G01. Self- and peer-assessment. Grade of 'complete' for satisfactory performance.

Intensive residential course offered each May; 5 days, 8 hours per day.

Prerequisite: Completion of Level IV of an Engineering and Management programme.

First offered May 1990.

Engineering Physics

Faculty as of January 15, 1989

W.J. Garland/*Chairman*
P.E. Jessop/*Associate Chairman*

Professors

Alfred J. Alcock/B.A.Sc. *(Toronto)*, Ph.D. *(Oxford)*/part-time
Edward A. Ballik/B.Sc. *(Queen's)*, D.Phil. *(Oxford)*, P.Eng.
H. Douglas Barber/B.Sc., M.Sc. *(Saskatchewan)*, Ph.D. *(London)*, P.Eng./part-time
George T. Bereznai/B.Eng. *(Adelaide)*, M.Eng., Ph.D. *(McMaster)*/part-time
Jen-Shih Chang/ B.Edu.Eng., B.Eng., M.Eng. *(Musashi Int. of Tech.)*, Ph.D. *(York)*
John A. Davies/B.A., M.A., Ph.D. *(Toronto)*/part-time
Archie A. Harms/B.Sc. *(British Columbia)*, M.Sc.Eng., Ph.D. *(Washington)*, P.Eng.
David P. Jackson/B.Sc., M.A., M.A.Sc., Ph.D. *(Toronto)*/part-time
Terence J. Kennett/B.Sc., M.Sc., Ph.D. *(McMaster)*
John S. Kirkaldy/B.A.Sc., M.A.Sc. *(British Columbia)*, Ph.D. *(McGill)*, F.R.S.C., F.A.S.M., P.Eng.
Krish V.S. Krishnan/B.Tech. *(Madras)*, M.S., Ph.D. *(Rochester)*
John P. Marton/B.Sc. *(Budapest)*, Ph.D. *(Western)*, P.Eng./part-time
David A. Thompson/B.Sc., Ph.D. *(Reading)*
Oleh A. Trojan/B.A.Sc., M.A., Ph.D. *(Toronto)*, P.Eng./part-time

Associate Professors

Alexander A. Berezin/B.Sc., M.Sc., Ph.D. *(Leningrad State)*
William J. Garland/B.Eng., M.Eng., Ph.D. *(McMaster)*, P.Eng.
Paul E. Jessop/B.Sc. *(Waterloo)*, M.A., Ph.D. *(Harvard)*
L. David Pengelly/B.A.Sc. *(Toronto)*, M.Sc., Ph.D. *(McGill)*, P.Eng.

ENGINEERING PHYSICS

Assistant Professors

Daniel T. Cassidy/M.Sc. *(Queen's)*, B.Eng., Ph.D. *(McMaster)*
J.D. Huizinga/B.Sc., M.Sc., Ph.D. *(Groningen, The Netherlands)*
Adrian Kitai/B.Eng. *(McMaster)*, Ph.D. *(Cornell)*

ENG PHYS 2A03 ELECTRICAL SCIENCE I
An introduction to electricity and magnetism for Engineering Physics students.
2 lects., 1 lab. or tut. (3); first term
Prerequisite: Physics 1E04 or 1E03, and credit or registration in Mathematics 2P04.

ENG PHYS 2E04 ELECTRICAL SCIENCE II
Analysis of ac circuits and ac power. Maxwell's equations and electromagnetic theory. Introductory modern physics.
3 lects., 1 lab. or tut. (3); second term
Prerequisite: Credit or registration in Engineering Physics 2A03.

ENG PHYS 3D03 PRINCIPLES OF NUCLEAR ENGINEERING
Introduction to fission and fusion energy systems. Energetics of nuclear reactions, interactions of radiation with matter, radioactivity, design and operating principles of fission and fusion reactors.
3 lects. (including demonstration experiments); first term
Prerequisite: Registration in Level III or above of any programme in Engineering or Physics.

ENG PHYS 3E03 FUNDAMENTALS OF PHYSICAL OPTICS
Reflection and refraction; geometrical optics; interference and diffration; optical constants of media; optical design software; introduction to design of optical systems.
2 lects., 1 tut. or lab. (3); first term
Prerequisite: Engineering Physics 2A03, 2E04.

ENG PHYS 3F03 FUNDAMENTALS OF SOLID STATE ELECTRONICS
Electrons in solids, with emphasis on semiconductors, carrier drift and diffusion; doped semiconductors; non-equilibrium carrier effects; optical properties of semiconductors.
2 lects., 1 lab or tut. (3); second term
Prerequisite: Engineering Physics 2A03 and 2E04.

ENG PHYS 3O03 INTRODUCTION TO FLUID MECHANICS AND HEAT TRANSFER
Fluid properties and statics are introduced. Basic equations of continuity, energy and momentum for internal and external flows are discussed. Similitude, dimensional analysis, measuring devices, fluid machinery and electromagnetic flow. Conduction and convection heat transfer.
2 lects., 1 lab or tut. (3); second term
Prerequisite: Mathematics 2M06 or 2P04 and 2Q04, any of which may be taken concurrently.

ENG PHYS 3X03 HUMAN PHYSIOLOGY
Basic introduction and working knowledge of the human body. Includes study of the cellular level of organization.
3 lects.; second term
Prerequisite: Completion of a minimum of 30 units beyond Level I in any Engineering or Science Programme.

ENG PHYS 4A04 THESIS OR DESIGN PROJECT
Thesis or design projects offered by any department in the Faculty of Engineering will be considered.
2 labs. (3); one or two terms
Prerequisite: Completion of Level III or permission of the Department.

ENG PHYS 4C02 SPECIAL TOPICS IN ENGINEERING PHYSICS
Selected methodological topics in engineering physics (analysis, design, simulation, synthesis, optimization...). Oral presentations by students on current topics in engineering.
1 lect.; first term and second term
Prerequisite: Registration in Level IV or V of any Engineering programme.

ENG PHYS 4D03 NUCLEAR REACTOR ANALYSIS
Introduction to nuclear energy; nuclear physics and chain reactions; reactor statics and kinetics; multigroup analysis, core thermalhydraulics; reactor design.
3 lects. (including field trip); first term
Prerequisite: Engineering Physics 3D03.

ENG PHYS 4E03 SOLID STATE DEVICES I
Electronic properties of semiconductors, contact phenomena; p-n junctions; Schottky diodes, photodiodes, bipolar transistors, field effect transistors.
2 lects. 1 tut.; first term
Prerequisite: Engineering Physics 3F03 or Engineering 3Q03.

ENG PHYS 4F03 SOLID STATE DEVICES II
Physical principles underlying operation of selected devices, and their characteristics; optical devices, avalanche devices, Gunn Effect devices, Read diodes, charge coupled devices, integrated circuits, Josephson junctions.
2 lects., 1 tut.; second term
Prerequisite: Credit or registration in Engineering Physics 4E03.

ENG PHYS 4G03 OPTICAL INSTRUMENTATION
Design of optical equipment (including reflective and refractive optical systems, interferometers and spectrometers). Optical sources and power measurements. Detectors (photographic, photoelectric, etc.), including use in the infrared and ultraviolet, and at low intensity levels.
2 lects., 1 tut.; first term
Prerequisite: Physics 3N03, or Engineering Physics 3E03.

ENG PHYS 4H06 SPECIAL STUDIES IN ENGINEERING PHYSICS
A special programme of studies to be arranged by mutual consent of the professor, departmental chairman, and the student. A student elects to work with a professor carrying out literature surveys, experiments, theoretical investigations, etc. A written report is required.
2 tuts., 1 lab. (3); both terms
Prerequisite: Permission of the Department.

ENG PHYS 4K03 OPTICAL COMMUNICATIONS SYSTEMS
Propagation of light in an optical fibre. Semiconductor lasers and detectors for optical communications. Analogue and digital coding. Signal to noise considerations. System design.
2 lects., 1 tut.; second term
Prerequisite: Registration in Level IV or V of any programme in Engineering or Physics.

ENG PHYS 4L03 NUCLEAR REACTOR THERMALHYDRAULICS
Introduction to two phase flow and nuclear reactor thermalhydraulics systems. Condensation and boiling phenomena and heat transfer mechanisms. Two phase flow apparatus and diagnostics techniques. Modelling of two phase flow by homogeneous and separated flow models.
2 lects., 1 lab.; second term
Prerequisite: Chemical Engineering 2O04 or Engineering Physics 3O03 or Mechanical Engineering 3O04.

ENG PHYS 4N03 PRINCIPLES OF FUSION ENERGY
Fusion phemonema and the plasma state; reaction analysis; Coulomb scattering; field effect trajectories; magnetic field configurations; particle transport; energy viability; bum cycles; inertial confinement; muon catalyzed fusion.
3 lects.; first term
Prerequisite: Engineering Physics 3D03.

ENG PHYS 4S04 LASERS AND ELECTRO-OPTICS
Basic properties of electromagnetic radiation. Optical modulation and detection. Non-linear optics. Multiple-beam interference and coherence. Optical resonators. Laser systems.
2 lects.; both terms
Prerequisite: Physics 3N03, or Engineering Physics 3E03.

ENG PHYS 4U04 MODERN AND APPLIED PHYSICS LABORATORY
Selected advanced experiments in two areas of applied physics, chosen from among: lasers and electro-optics; solid state electonics; nuclear engineering; biomedical engineering.
2 labs. (3); both terms
Prerequisite: Registration in Level IV Engineering Physics or Engineering Physics and Management.

ENG PHYS 4W03 ACQUISITION AND ANALYSIS OF EXPERIMENTAL INFORMATION
A system approach to experimental measurement, in which topics such as simulation, modelling, estimation, signal-processing and enhancement, data reduction techniques, and modern sensing methods are examined.
1 lect., 1 tut.; first term
Prerequisite: Mathematics 3C06, or 3C03 and 3D03; or permission of the Department.

ENG PHYS 4Z03 SEMICONDUCTOR DEVICE PHYSICS
Physical, chemical and metallurgical processes for fabrication of modern semiconductor devices. Doping, chemical vapour deposition, oxidation, diffusion, epitaxy, implantation, ion etching, metal and dielectric deposition.
2 lects., 1 tut. (2); second term
Prerequisite: Credit or registration in Engineering Physics 4E03; or permission of the department.

PHYSICS 3B06 ELECTRONICS
Network theory and filters, semiconductor devices, amplifier circuits, D.C. power supplies, integrated circuits, operational amplifiers and digital circuits.
2 lects.; both terms; 1 lab. (2); both terms
Prerequisite: Engineering Physics 2A03 and 2E04, or Physics 2B06.

PHYSICS 4D06 DIGITAL LOGIC AND COMPUTER SYSTEMS
The design and use of digital logic systems, and their application to data acquisition and control techniques. The project-oriented laboratory involves both hardware and software.
2 lects., 1 lab. (3); both terms
Prerequisite: Engineering Physics 2A03 and 2E04, or Physics 2B06. Not open to students with credit or registration in any of Computer Engineering 2HA3, 3HB3, Electrical Engineering 2H03, 3H03.

For **Graduate courses**, see the *Calendar of the School of Graduate Studies*.

English

Faculty as of January 15, 1989

Maureen Halsall/*Chairman*

Professors Emeriti

Alwyn Berland/M.A. *(Chicago)*, M.Litt. *(Cantab.)*
Berners A.W. Jackson/B.A. *(McMaster)*, D.Phil. *(Oxford)*
Dorothy S. Murphy/B.A., M.A. *(Toronto and Oxford)*
Warwick J.B. Owen/M.A. *(New Zealand and Oxford)*, Ph.D. *(Wales)*, D.Litt. *(McMaster)*, F.R.S.C.
F. Norman Shrive/C.D., B.A. *(McMaster)*, M.A. *(Toronto)*, Ph.D. *(Queen's)*

Professors

Maqbool Aziz/B.A., M.A. *(Punjab)*, D.Phil. *(Oxford)*
Carl P.A. Ballstadt/B.A., M.A. *(Western)*, Ph.D. *(London)*
Alan G. Bishop/B.A., D.Phil. *(Rhodes, S. Africa)*, M.A., Ph.D. *(Oxford)*
David Blewett/B.A., M.A. *(Manitoba)*, Ph.D. *(Toronto)*
Laurel A. Braswell-Means/B.A., M.A. *(Arkansas)*, M.A., Ph.D. *(Toronto)*
Anthony S. Brennan/B.A. *(Oxford)*, M.A., Ph.D. *(McMaster)*
Andrew W. Brink/B.A., M.A. *(Toronto)*, Ph.D. *(London)*
Thomas H. Cain/B.A., M.A. *(Toronto)*, Ph.D. *(Wisconsin)*
Joan Coldwell/B.A., M.A. *(London)*, Ph.D. *(Harvard)*
Douglas J.M. Duncan/B.A. *(Oxford)*, Ph.D. *(Aberdeen)*
H. John Ferns/B.A., M.A. *(Oxford)*, Ph.D. *(Western)*
Maureen P. Halsall/B.A. *(McMaster)*, M.A. *(Radcliffe)*, Ph.D. *(Harvard)*
Antony D. Hammond/B.A. *(New Zealand)*, M.A., Ph.D. *(Auckland)*
Brian John/M.A., Dipl.Ed., Ph.D. *(University College of North Wales)*
James King/B.A. *(Toronto)*, M.A., Ph.D. *(Princeton)*
Alvin A. Lee/B.D., M.A., Ph.D. *(Toronto)*
Richard E. Morton/B.A. *(Wales)*, B.Litt. *(Oxford)*
Graham Petrie/M.A. *(St. Andrews)*, B.Litt. *(Oxford)*
W. Graham Roebuck/B.A. *(Durham)*, M.A. *(McMaster)*, Ph.D. *(London)*
Ronald W. Vince/B.A. *(McMaster)*, M.A. *(Rice)*, Ph.D. *(Northwestern)*
Chauncey D. Wood/B.A. *(Union College)*, M.A., Ph.D. *(Princeton)*

Associate Professors

James D. Brasch/B.S. *(State University of New York)*, M.A. *(Colgate)*, Ph.D. *(Wisconsin)*
James Dale/B.A., M.A., Ph.D. *(Cambridge)*
Donald C. Goellnicht/B.A. *(Queen's)*, M.A., Ph.D. *(McMaster)*
Norman Rosenblood/B.A. *(Western)*, M.A. *(McMaster)*, Ph.D. *(Pittsburgh)*
Michael L. Ross/B.A. *(Harvard College)*, M.A., Ph.D. *(Harvard)*
Joseph T. Sigman/B.A. *(King's College, Wilkes-Barre)*, M.A., Ph.D. *(Pennsylvania)*

Assistant Professors

Peter Joseph Adamson/B.A. *(Trent)*, M.A., Ph.D. *(Toronto)*
Sylvia Bowerbank/B.A. *(McMaster)*, B.Educ. *(Toronto)*, M.A. *(Simon Fraser)*, Ph.D. *(McMaster)*
David Clarke/B.A., M.A., Ph.D. *(Western)*
Ronald Granofsky/B.A. *(Trent)*, M.A. *(Kent)*, Ph.D. *(Queen's)*
Roger L. Hyman/B.A. *(York)*, M.A., Ph.D. *(Toronto)*
Mary E. O'Connor/B.A. *(McGill)*, M.A., Ph.D. *(Toronto)*
Peter Walmsley/B.A., M.A. *(Toronto)*, Ph.D. *(Cambridge)*
Lorraine M. York/B.A., M.A., Ph.D. *(Toronto)*

Sessional Assistant Professor

Dorothy Bray/B.A. *(McGill)*, Ph.D. *(Edinburgh)*

Department Notes:

1. Students who do not meet the prerequisites for courses should consult the Department, since in some cases exceptions may be made.
2. Level III and IV courses, unless specifically restricted, are open as electives to Level II students with the stated prerequisites.
3. Courses **open as electives** to qualified students registered in **any** University programme.

English 2C03	Contemporary Canadian Fiction
English 2D03	Biblical Traditions in Literature
English 2F03	Studies in American Literature
English 2M03	Practical Criticism
English 2R03	Topics in Restoration and 18th-Century Literature
English 3A03	Techniques of Expository Writing
English 3B03	Psychoanalytic Approaches to Literary Texts
English 3E03	Shakespeare: Selected Plays
English 3F03	Creativity and Human Interaction
English 3FF3	Techniques of Creative Writing
English 3GG3	Topics in 19th-Century Literature
English 3HH3	Topics in Poetry
English 3II3	Topics in Fiction I
English 3JJ3	Topics in Fiction II
English 3KK3	Topics in Critical Approaches
English 3P03	Modern Drama in English
English 3PP3	Topics in World Literature in English
English 3X03	Topics in 20th-Century Literature I
English 3XX3	Topics in 20th-Century Literature II
English 3Z03	Contemporary Canadian Poetry
English 4A03	The Classics and English Literature
English 4D03	Topics in Medieval and Renaissance Literature

ENGLISH 1D06 ENGLISH LITERATURE: FORMS AND APPROACHES

A selection of various areas of literary study (such as periods, genres, contexts, and approaches) will be examined, using texts from a wide variety of periods and forms of English literature. In this course considerable emphasis is placed on the development of critical skills in reading and writing.
2 lects., 1 tut.; two terms
Prerequisite: Grade 13 English or OAC English 1; or permission of the Department. Not available to students with credit in English 1A06, 1B06, 1C06 or 2E06.

ENGLISH 2B06 THE DEVELOPMENT OF ENGLISH DRAMA

English drama from the medieval period to the close of the 18th century (excluding Shakespeare).
3 lects.; two terms
Prerequisite: Registration in a programme in English.
Same as Drama 2B06.

ENGLISH 2C03 CONTEMPORARY CANADIAN FICTION

A study of the themes and structure of the contemporary Canadian novel, usually with emphasis upon the relationship of Canada's cultural patterns and its literature.
3 lects.; one term
Prerequisite: One of English 1A06, 1B06 or 1D06; or permission of the Department.

ENGLISH 2D03 BIBLICAL TRADITIONS IN LITERATURE

A study of the influence of the Bible on Western literature, especially English. Approaches may include the examination of symbolism, imagery, typology, doctrinal themes and narrative structures.
3 lects.; one term
Prerequisite: Open to students in Level II and above, except to students with credit for English 2P03.
Same as Comparative Literature 2D03.

ENGLISH 2F03 STUDIES IN AMERICAN LITERATURE

A study of some of the most important writers who developed American literature as a distinctive mode of writing in English.
3 lects.; one term
Prerequisite: One of English 1A06, 1B06 or 1D06; or permission of the Department. Not available to students with credit in, or registration in, English 2H06.

ENGLISH 2G06 CANADIAN LITERATURE

Major aspects of the development of Canadian literature from the late 18th century to the mid-20th century. French-Canadian work in translation will be used for comparative purposes.
3 lects.; two terms
Prerequisite: Registration in a programme in English.

ENGLISH 2H06 AMERICAN LITERATURE

A survey of significant American writers from the 17th century to the present, which emphasizes the interrelationship between the literature and its philosophical and historical background.
3 lects.; two terms
Prerequisite: Registration in a programme in English.

ENGLISH 2I06 MODERN BRITISH LITERATURE

A study of representative literature by British writers of the 20th century. Through criticism of poems, plays and fiction, an attempt is made to relate modern British literature to its social, intellectual and cultural context.
3 lects.; two terms
Prerequisite: Registration in a programme in English.

ENGLISH 2M03 PRACTICAL CRITICISM

The course gives the student the opportunity to write a piece of criticism once a week. This work is evaluated by members of the course and the instructor.
2 lects., first term; 1 lect.; second term
Prerequisite: Permission of the Department; departmental permission slip required.
Enrolment is limited.

ENGLISH 2R03 TOPICS IN RESTORATION AND 18TH-CENTURY LITERATURE

1989-90: Jane Austen

A close critical reading of the six completed novels: *Sense and Sensibility, Pride and Prejudice, Northanger Abbey, Mansfield Park, Emma* and *Persuasion.*

3 lects.; one term

Prerequisite: One of English 1A06, 1B06 or 1D06; or permission of the Department.

English 2R03 may be repeated, if on a different topic, to a total of six units.

ENGLISH 2V06/2VV6 THE ENGLISH LANGUAGE

An analysis of the way the English language works, with particular reference to syntactic patterns. The following areas will be considered: English phonology, historical linguistics, morphology, transformational-generative grammar, vocabulary and word formation.

3 lects.; two terms

Prerequisite: Registration in an English programme.*Students who wish to take English 2V06 in fulfillment of the language requirement in the Combined Honours English and Another Subject or the B.A. English programmes must register in the course as English 2VV6 in which case it may not be used to fulfill the English area requirements.*

ENGLISH 3A03 TECHNIQUES OF EXPOSITORY WRITING

A course designed to provide practical training in the writing of clear, coherent, persuasive prose. Although there will be some study of contemporary prose models, the main work of the course will consist of regular exercises and writing assignments embracing the main types of exposition.

2 hrs. (lect.), 1 hr. (tut.); one term

Prerequisite: Open to students in Level II and above.

Enrolment is limited.

ENGLISH 3B03 PSYCHOANALYTIC APPROACHES TO LITERARY TEXTS

The basic assumptions and methods of psychoanalytic criticism will be studied with reference to selected texts in drama, fiction and poetry from Shakespeare to the present.

3 lects.; one term

Prerequisite: Registration in Level II and above. Not available to students with credit for this topic if taken as English 3KK3.

Same as Sociology 2X03.

ENGLISH 3D03 THE EARLIEST ENGLISH LITERATURE

An introduction to Old English alliterative poetry through close reading of representative modes, such as heroic, lyric, elegiac and gnomic, supplemented by related prose texts.

3 lects.; one term

Prerequisite: Registration in Level III or IV of a programme in English.

ENGLISH 3DD3 BEOWULF

An exploration of the Old English epic *Beowulf*, supplemented by related poetic and prose texts.

3 lects.; one term

Prerequisite: English 3D03.

ENGLISH 3E03 SHAKESPEARE: SELECTED PLAYS

A study of a representative selection of plays.

3 lects.; one term

Prerequisite: One of English 1A06, 1B06, or 1D06, or Drama 1A06. Not open to students receiving credit for English/Drama 3K06.

ENGLISH 3F03 CREATIVITY AND HUMAN INTERACTION

A study of the motivations of some representative writers and of the psychological processes in literary creativity. Psychoanalytic and psychiatric contributions to understanding the subject will be considered.

3 lects.; one term

Prerequisite: Permission of the instructor. Not available to students with credit in this topic if taken as English 3KK3.

Same as Social Science 3B03 and Sociology 3S03.

ENGLISH 3FF3 TECHNIQUES OF CREATIVE WRITING

This course will require the composition of verse and prose. Experiments with a variety of forms will be attempted in order to increase the student's mastery of verse and prose techniques.

2 lects. (first term); 1 lect. (second term)

Prerequisite: At least a grade of B– in six units of English; and permission of the Department.

Enrolment is limited.

ENGLISH 3GG3 TOPICS IN 19TH-CENTURY LITERATURE

1989-90: The Brontës

An introduction to the lives and achievement of the three Brontë sisters. The course will involve a critical reading of the seven novels of Anne, Emily and Charlotte Brontë.

3 lects.; one term

Prerequisite: One of English 1A06, 1B06 or 1D06; or permission of the Department.

English 3GG3 may be repeated, if on a different topic, to a total of six units.

ENGLISH 3HH3 TOPICS IN POETRY

1989-90: Women Poets of the Twentieth Century

A study of American and Canadian writers who have established a tradition of poetry by women in this period. Poets discussed will include H.D., Adrienne Rich, Sylvia Plath, Anne Sexton, Dorothy Livesay, Margaret Atwood, P.K. Page and Phyllis Webb.

3 lects.; one term

Prerequisite: One of English 1A06, 1B06 or 1D06; or permission of the Department.

English 3HH3 may be repeated, if on a different topic, to a total of six units.

ENGLISH 3I03 STUDIES IN 16TH-CENTURY LITERATURE

A study of the prose and poetry of the first phase of the English Renaissance, with some emphasis on the work of More and Sidney, and subsidiary reading of continental writers influential in England, such as Petrarch, Pico, Erasmus, Castiglione, Machiavelli and Montaigne.

3 lects.; one term

Prerequisite: Registration in Level III or IV of a programme in English.

Same as Comparative Literature 3J03.

ENGLISH 3II3 TOPICS IN FICTION I

1989-90: James Joyce

An introduction to the literary achievement of James Joyce, with some consideration of his life, background and influence.

3 lects.; one term

Prerequisite: One of English 1A06, 1B06 or 1D06; or permission of the Department.

English 3II3 may be repeated, if on a different topic, to a total of six units.

ENGLISH 3JJ3 TOPICS IN FICTION II

1989-90: Contemporary Black American Fiction

A study of selected novels by black American writers published in the last fifty years. The works will be read in light of recent theories of race and gender as factors in literary production.

3 lects.; one term

Prerequisite: One of English 1A06, 1B06 or 1D06; or permission of the Department.

English 3JJ3 may be repeated, if on a different topic, to a total of six units.

ENGLISH 3K06 SHAKESPEARE

An extensive critical reading and discussion of selected plays.

3 lects.; two terms

Prerequisite: Registration in Level III or IV of a programme in English.

Same as Drama 3K06.

ENGLISH 3KK3 TOPICS IN CRITICAL APPROACHES

1989-90: Fiction by Women

Selected texts written by women from the seventeenth century to the present will be examined in light of current critical theories about women's writing.

Prerequisite: One of English 1A06, 1B06, 1D06; or permission of the Department.

English 3KK3 may be repeated, if on a different topic, to a total of six units.

ENGLISH 3P03 MODERN DRAMA IN ENGLISH

A representative selection of plays by modern British, Irish and North American dramatists will be examined in order to study the relationship between drama and society in our age, as well as conventions and experiments in the contemporary theatre.

3 lects.; one term

Prerequisite: One of English 1A06, 1B06 or 1D06, or Drama 1A06.

Same as Drama 3P03.

ENGLISH 3PP3 TOPICS IN WORLD LITERATURE IN ENGLISH

3 lects.; one term

Prerequisite: One of English 1A06, 1B06 or 1D06; or permission of the Department.

English 3PP3 may be repeated, if on a different topic, to a total of six units.

Not offered in 1989-90.

ENGLISH 3Q03 THE HISTORY AND THEORY OF CRITICISM

A survey of the main developments in the theory and practice of literary criticism from Plato to the early 20th century.

3 lects.; one term

Prerequisite: Registration in Level III or IV of a programme in English.

Same as Comparative Literature 3Q03.

ENGLISH 3QQ3 MODERN CRITICAL THEORY

The theory and practice of literary criticism from Eliot to the present.

3 lects.; one term

Prerequisite: Registration in Level III or IV of a programme in English.

Same as Comparative Literature 3QQ3.

ENGLISH 3T03 SPENSER

The main work of the course will be close study of *The Faerie Queene*, but *The Shepheardes Calendar, Epithalamion* and *Prothalamion* will also be read.

3 lects.; one term

Prerequisite: Registration in Level III or IV of a programme in English.

ENGLISH 3V06 STUDIES IN 17TH-CENTURY LITERATURE

A detailed examination of poets and prose-writers of the period, with emphasis on the poetry of Donne, the 'metaphysical school', Jonson and Milton.

3 lects.; two terms

Prerequisite: Registration in Level III or IV of a programme in English.

ENGLISH 3X03 TOPICS IN 20TH-CENTURY LITERATURE I
1989-90: Form in Fiction
A close study of selected modern novels of the period 1900-1960 noting particularly the distinction between the 'traditional' and 'modern' forms of the novel.
3 lects.; one term
Prerequisite: One of English 1A06, 1B06 or 1D06; or permission of the Department.
English 3X03 may be repeated, if on a different topic, to a total of six units.

ENGLISH 3XX3 TOPICS IN 20TH-CENTURY LITERATURE II
1989-90: Modern Canadian Drama
Representative plays from various Canadian regions studied with attention to their dramatic form and their treatment of regional as well as general social, historical and political themes.
3 lects.; one term
Prerequisite: One of English 1A06, 1B06 or 1D06; or Drama 1A06.
Same as Drama 3XX3.
English 3XX3 may be repeated, if on a different topic, to a total of six units.

ENGLISH 3Z03 CONTEMPORARY CANADIAN POETRY
The development of Canadian poetry from the 1940's to the present. Parallel developments in French-Canadian poetry (studied in translation) will also be considered.
3 lects.; one term
Prerequisite: One of English 1A06, 1B06 or 1D06; or permission of the Department.

ENGLISH 4A03 THE CLASSICS AND ENGLISH LITERATURE
A course devoted to an exploration of the influences of classical literature upon English writers from medieval to modern times.
1 seminar (2 hrs.); one term
Prerequisite: Registration in Level III or IV of any programme in literature; or permission of the Department.
Offered in alternate years.
Same as Classical Civilization 4A03 and Comparative Literature 4D03.

ENGLISH 4B06 ENGLISH LITERATURE (1660-1800)
A study of English literature during the period 1660-1800, with special attention to works by Dryden, Swift, Pope and Johnson.
3 lects.; two terms
Prerequisite: Registration in Level III or IV of a programme in English.

ENGLISH 4D03 TOPICS IN MEDIEVAL AND RENAISSANCE LITERATURE
1989-90: George Herbert
A study of George Herbert's poems in *The Temple* using a variety of modern critical techniques.
Seminar (2 hrs.); one term
Prerequisite: Open to students in Level II and above.
Same as Drama 4D03 in 1987-88.
English 4D03 may be repeated, if on a different topic, to a total of 6 units.

ENGLISH 4E06 CHAUCER AND HIS CONTEMPORARIES
A critical, mainly literary, course in the poetry of late 14th-century England. It will study the writings of Chaucer in some depth, before taking up examples of medieval romance, allegory and drama.
3 lects.; two terms
Prerequisite: Registration in Level III or IV of a programme in English.

ENGLISH 4H03 LITERATURE AND FILM
An examination of the particular characteristics of both literature and film and the inter-relationships between them through a detailed study of selected novels, short stories and plays, and the films that have been based on them.
3 lects., plus one weekly film screening; one term
Prerequisite: Registration in Level III or IV of a programme in Drama or Literature or Art History; or permission of the instructor or the Drama Chairman. It is recommended that students should already have taken Drama 2X06.
Same as Art History 4HH3, Comparative Literature 4H03, and Drama 4H03.

ENGLISH 4L03 ROMANTIC POETRY
A study of selected poems and, where appropriate, of the literary theory of the major Romantic poets. Special attention will be given to Blake, Wordsworth, Coleridge, Byron, Shelley, Keats.
3 lects.; one term
Prerequisite: Registration in Level III or IV of a programme in English.

ENGLISH 4M03 VICTORIAN POETRY
A study of selected poems and, where appropriate, of the literary theory of the major Victorian poets. Special attention will be given to Tennyson, Browning, Arnold, Hopkins.
3 lects.; one term
Prerequisite: Registration in Level III or IV of a programme in English.

ENGLISH 4N06 THE BRITISH NOVEL
This course, in assessing and analysing approximately 12 novels, will trace the history of English fiction to the 20th century. The course focuses on the varieties of narrative forms, while also exploring the intellectual, cultural and psychological contexts of fiction.
3 lects.; two terms
Prerequisite: Registration in Level III or IV of a programme in English.

ENGLISH 4X03 INDEPENDENT STUDY
In consultation with members of the English Department, students will prepare an essay on an approved topic designed to bring together aspects of their work over the previous years.
Prerequisite: Registration in Level IV of an Honours programme in English.

For **Graduate Courses** see *Calendar of School of Graduate Studies.*

Film

See *Drama 2X06, 3R03, 3RR3, 3Y03, 4H03, 4K03.* Film courses are not accepted for R-group credit for students in Honours or B.A. programmes in English.

French

Faculty as of January 15, 1989

C. Rouben/*Chairman*

Professors Emeriti

Pierre-Marie Conlon/B.A., M.A. *(Auckland)*, D. de l'U. *(Paris)*, F.R.S.C.
W. Norman Jeeves/B.A., M.A. *(Cambridge)*, L. èsL. *(Bordeaux)*
Arthur W. Patrick/M.A. *(Manitoba)*, D. de l'U. *(Paris-Sorbonne)*
Marie L. Stock/B.A. *(Queen's)*, M.A. *(McGill)*, Ph.D. *(Columbia)*

Professors

Owen R. Morgan/B.A., M.A. *(Nottingham)*
César Rouben/L. ès S. *(Paris-Sorbonne)*, B.A. *(Sir George Williams)*, M.A., Ph.D. *(McGill)*

Associate Professors

Marie-Madeleine Ahmed/L. ès L., M ès L., D. de l'U *(Paris-Sorbonne)*
Caroline Bayard/L ès L., M. ès L. *(Toulouse)*, M.A., Ph.D. *(Toronto)*
William F. Hanley/B.A. *(Toronto)*, M. ès L. *(Paris-Sorbonne)*, D.Phil. *(Oxford)*
Madeleine Jeay/L. ès L. *(Bordeaux)*, M.A., Ph.D. *(Montreal)*
Charles E. Jose/B.A. *(Western)*, M.A. *(Toronto)*
Michael Kliffer/B.A. *(British Columbia)*, M.A. *(Michigan)*, Ph.D. *(Cornell)*
Dominique Lepicq/L. ès L. *(Caen)*, M.A. *(Ottawa)*, Ph.D. *(Toronto)*
Gabriel Moyal/B.A. *(McGill)*, M.A., Ph.D. *(Toronto)*
Elaine F. Nardocchio/B.A. *(St. Francis-Xavier)*, M.A. *(Middlebury)*, Ph.D. *(Laval)*
Brian S. Pocknell/M.A. *(Manchester)*, D. de l'U. *(Paris-Sorbonne)*
Anna St. Leger Lucas/B.A. *(Nottingham)*, M.A. Ph.D. *(British Columbia)*
Gary A. Warner/B.A. *(London)*, L. ès L., D. de l'U. *(Caen)*

Assistant Professors

Vincent A. Betti/B.A., L. ès L. (Laval)
Jane A.C. Rush/B.A. *(Toronto)*, M.A., Ph.D. *(U.C.L.A.)*
John C. Stout/B.A. (British Columbia), Ph.D. *(Princeton)*

Lecturer

Christine Portelance/B.A., M.A., *(Montréal)*

Department Note:
The Department reserves the right to place students in a course appropriate to their language skills.

Beginner's Language Course

FRENCH 1Z06 BEGINNER'S INTENSIVE FRENCH
An intensive course for developing basic skills in both written and spoken French. The normal sequel to this course is French 1B06.
5 hrs. (including lab. practice); two terms
Prerequisite: Open, except to graduates of Grade 12 French or Grade 13 or OAC French. Not open to Francophones. Students with prior knowledge of the language as determined by a placement test may be required to take an appropriate alternative.
Enrolment is limited.

Intermediate and Advanced Language and Literature Courses

FRENCH 1A06 INTRODUCTION TO FRENCH STUDIES: ADVANCED LEVEL
Review of grammar, oral and written practice, and introduction to literary analysis by the reading of selected French and/or French-Canadian texts. For students intending to enter B.A. or Honours French.
4 tuts.; two terms
Prerequisite: Grade 13 or OAC French; or permission of the Department. Students with Français 12^{e} or 13^{e} may be required to take an appropriate alternative. Not available to students with credit in or registered in French 1B06.

FRENCH 1B06 INTERMEDIATE FRENCH
Review of grammar, oral and written practice. For students not intending to enter a programme in French.
4 tuts.; two terms
Prerequisite: Grade 12 French, or French 1Z06 with a grade of at least B; or permission of the Department. Students with Français 12^{e} or 13^{e} may be required to take an appropriate alternative. Not available to students with credit in or registered in French 1A06.

FRENCH 2A03 FRENCH LANGUAGE PRACTICE: WRITTEN
Grammar and composition.
2 tuts.; two terms
Prerequisite: French 1A06 or 1B06.

FRENCH 2C03 FRENCH LANGUAGE PRACTICE: ORAL
Development of conversational skills.
2 tuts.; two terms
Prerequisite: Registration in a programme in French; or permission of the Department. Departmental permission slip required.
Enrolment is limited.

FRENCH 2F03 THE CIVILIZATION OF FRENCH CANADA I
The study of the socio-political and religious evolution of early French Canada and the reflection of these factors in French-Canadian culture: journalism, music, architecture.
3 lects.; one term
Prerequisite: French 1A06 or 1B06; or permission of the Department.

FRENCH 2FF3 THE CIVILIZATION OF FRENCH CANADA II
The study of the socio-political, cultural and linguistic evolution of contemporary French Canada and the reflection of these factors in French-Canadian literature, journalism, music and cinema.
3 lects.; one term
Prerequisite: French 1A06 or 1B06; or permission of the Department.

FRENCH 2G03 FRENCH LANGUAGE PRACTICE: ELEMENTARY TRANSLATION
An introduction to translation techniques (French to English and English to French) and to the use of pertinent reference material.
3 tuts.; one term
Prerequisite: A grade of at least B– in French 1A06 or a grade of at least B in French 1B06, and registration in a French programme. Departmental permission slip required.
Enrolment is limited.

FRENCH 2H03 INTRODUCTION TO FRENCH LINGUISTICS
An introduction to the descriptive analysis of language (phonology, morphology, syntax, semantics) with special reference to French.
3 tuts.; one term
Prerequisite: French 1A06 or 1B06.

FRENCH 2J03 NINETEENTH-CENTURY FRENCH LITERATURE I
Selected novels, plays and poems representative of the main currents of 19th-century French literature.
3 lects.; one term
Prerequisite: French 1A06 or 1B06.

FRENCH 2JJ3 NINETEENTH-CENTURY FRENCH LITERATURE II
Selected themes appearing in the works of the major French writers of the 19th century.
3 lects.; one term
Prerequisite: French 1A06 or 1B06.

FRENCH 2W03 TWENTIETH-CENTURY FRENCH LITERATURE I
Aspects of the development of 20th-century literature to the end of the Second World War.
3 lects.; one term
Prerequisite: French 1A06 or 1B06.

FRENCH 2WW3 TWENTIETH-CENTURY FRENCH LITERATURE II
Aspects of the development of 20th-century literature since the Second World War.
3 lects.; one term
Prerequisite: French 1A06 or 1B06.

FRENCH 3AA3 THE MODERN FRENCH-CANADIAN NOVEL
Representative novels by contemporary authors with emphasis upon the relationship between technique and meaning.
3 lects.; one term
Prerequisite: French 2F03 or 2FF3; or permission of the Department.

FRENCH 3B03 FRENCH SEMANTICS
An introduction to various theories of meaning, treating issues such as reference, synonymy, paraphrase, cultural overlap, distinctive features and lexicography.
3 lects.; one term
Prerequisite: French 2H03 and 2A03; or permission of the Department.
Alternates with French 4C03.
Not offered in 1989-90.

FRENCH 3BB3 CONTEMPORARY QUEBEC THEATRE
Contemporary experimental theatre, and representative playwrights such as Marcel Dubé and Michel Tremblay.
3 lects.; one term
Prerequisite: French 2F03 or 2FF3; or permission of the Department.
Same as Drama 3BB3.

FRENCH 3C03 FRENCH LANGUAGE PRACTICE: WRITTEN
Advanced grammar and composition; introduction to stylistics.
2 tuts.; two terms
Prerequisite: A grade of at least C– in French 2A03; or permission of the Department.

FRENCH 3CC3 FRENCH LANGUAGE PRACTICE: INTERMEDIATE TRANSLATION
A course designed for the systematic comparison of French and English, including comparative stylistics, with special reference to problems in the translation of texts of a general nature.
3 tuts.; one term
Prerequisite: French 2A03 and 2G03. Departmental permission slip required.
Enrolment is limited.

FRENCH 3E03 APPLIED LINGUISTICS AND SECOND-LANGUAGE LEARNING
An examination of various aspects of second language acquisition as applied to the teaching of French, with special emphasis on psycholinguistic factors.
3 lects.; one term
Prerequisite: French 2H03 and registration in a programme in French; or permission of the Department.
Alternates with French 3I03.
Not offered in 1989-90.

FRENCH 3F03 FRENCH LANGUAGE PRACTICE: ORAL
This course includes discussion of modern French institutions and culture.
2 tuts.; two terms
Prerequisite: French 2C03 and registration in a programme in French; or permission of the Department. Departmental permission slip required.
Enrolment is limited.

FRENCH 3G03 GENERAL AND COMPARATIVE PHONETICS
Elementary questions of phonetic theory (physiological basis, speech sounds in isolation and in sequence, the syllable, the phoneme, prosodic features, graphemics); followed by a comparison of the modern French and English systems of sounds.
3 lects.; one term
Prerequisite: French 1A06 or 1B06; or permission of the Department.
Not offered in 1989-90.

FRENCH 3I03 FRENCH SOCIOLINGUISTICS
The study of linguistic variations within French-speaking communities with special reference to the Canadian situation.
3 lects.; one term
Prerequisite: French 2H03 and registration in a programme in French; or permission of the Department.
Alternates with French 3E03.

FRENCH 3K03 EIGHTEENTH-CENTURY FRENCH LITERATURE I
The early 18th century with emphasis on Montesquieu, Marivaux and Prévost, and on the early writings of Voltaire.
3 lects.; one term
Prerequisite: 18 units of French and registration in a programme in French; or permission of the Department.

FRENCH 3KK3 EIGHTEENTH-CENTURY FRENCH LITERATURE II
Texts representing the main aspects of Enlightenment thought and literature from the publication of the preliminary discourse of the *Encyclopédie* to the Revolution.
3 lects.; one term
Prerequisite: 18 units of French and registration in a programme in French; or permission of the Department.

FRENCH 3MM3 THE EIGHTEENTH-CENTURY FRENCH NOVEL
A study of the genesis and themes of representative 18th-century novels.
3 lects.; one term
Prerequisite: 18 units of French and registration in a programme in French; or permission of the Department.

FRENCH 3Q03 SEVENTEENTH-CENTURY FRENCH LITERATURE I
A study of selected plays by Corneille, Molière and Racine.
3 lects.; one term
Prerequisite: 18 units of French and registration in a programme in French; or permission of the Department.
Same as Drama 3Q03.

FRENCH 3QQ3 SEVENTEENTH-CENTURY FRENCH LITERATURE II

A consideration of selected themes as they appear in the works of major French writers of the 17th century.

3 lects.; one term

Prerequisite: 18 units of French and registration in a programme in French; or permission of the Department.

FRENCH 3R03 MEDIEVAL FRENCH LANGUAGE AND LITERATURE

An introduction to the Old French language and a study of selected medieval texts.

3 lects.; one term

Prerequisite: 18 units of French and registration in a programme in French; or permission of the Department.

Not offered in 1989-90.

FRENCH 3Y03 FRENCH CINEMA

A survey of French Cinema from its beginnings to the present, through detailed critical analysis of major works.

2 lects., plus one weekly film screening; one term.

Prerequisite: Drama 2X06, or French 1A06 or 1B06; or permission of the instructor or the Drama Chairman. May be taken as an elective only by students in a programme in French.

Same as Art History 3Y03 and Drama 3Y03.

FRENCH 3Z03 AFRICAN AND CARIBBEAN FRENCH LITERATURE

An introduction to French African and Caribbean literature from the origins of the Negritude movement to the present.

3 lects.; one term

Prerequisite: French 1A06 or 1B06. Not available to students with credit for French 2Z03.

FRENCH 4A03 FRENCH LANGUAGE PRACTICE

Advanced stylistics and composition.

2 tuts.; two terms

Prerequisite: A grade of at least B – in French 3C03 or 3C04 and registration in an Honours programme in French; or permission of the Department.

FRENCH 4B03 FRENCH LANGUAGE PRACTICE: ADVANCED TRANSLATION

Practice in the translation into English of texts of a specialized nature (e.g., administration, business, politics).

3 tuts.; one term

Prerequisite: French 3CC3. Departmental permission slip required.

Not offered in 1989-90.

Enrolment is limited.

FRENCH 4BB3 FRENCH LANGUAGE PRACTICE: ADVANCED TRANSLATION

Practice in the translation into French of texts of a specialized nature (e.g., administration, business, politics).

3 tuts.; one term

Prerequisite: French 3CC3. Departmental permission slip required.

Enrolment is limited.

FRENCH 4C03 FRENCH MORPHOLOGY AND SYNTAX

A study of articles treating various morphological and syntactic problems. Both functional and generative approaches will be examined.

3 lects.; one term

Prerequisite: 18 units of French including French 2H03 and registration in a programme in French; or permission of the Department.

Alternates with French 3B03.

FRENCH 4E03 HISTORY OF THE FRENCH LANGUAGE AFTER 1600

Among the topics discussed will be vocabulary growth; loan words; slang; popular, literary and regional language; syntax and phonetic changes.

3 lects.; one term

Prerequisite: 18 units of French and registration in a programme in French; or permission of the Department.

Not offered in 1989-90.

FRENCH 4F03 TOPICS IN EIGHTEENTH-CENTURY FRENCH LITERATURE

1989-90: Voltaire

Specific texts by Voltaire related to the works of other writers of the time.

Seminar (2 hrs.); one term

Prerequisite: 18 units of French including French 3K03 or 3KK3, and registration in a programme in French; or permission of the Department.

French 4F03 may be repeated, if on a different topic, to a total of six units.

FRENCH 4I03 TOPICS IN FRENCH POETRY

1989-90: Poets and Humour

Games poets play with words, rhymes, forms, satire and parodies from 16th-Century vertical puzzle poems to 20th-Century concrete poetry and picture poems.

Seminar (2 hrs.); one term

Prerequisite: 18 units of French and registration in a programme in French; or permission of the Department.

French 4I03 may be repeated, if on a different topic, to a total of six units.

FRENCH 4J03 FRENCH LITERATURE OF THE RENAISSANCE

Characteristic themes of Renaissance humanism as they appear in the works of Rabelais, Montaigne, and selected poets.

Seminar (3 hrs.); one term

Prerequisite: 18 units of French and registration in a programme in French; or permission of the Department.

FRENCH 4LL3 TOPICS IN FRENCH AFRICAN AND CARIBBEAN LITERATURE

1989-90: Contemporary Women Writers of Francophone Africa and the French Caribbean.

Seminar (2 hrs.); one term

Prerequisite: 18 units of French including 3Z03, and registration in a programme in French; or permission of the Department.

French 4LL3 may be repeated, if on a different topic, to a total of six units.

FRENCH 4N03 TOPICS IN THE FRENCH NOVEL

1989-90: Zola

A close reading of selected novels of Emile Zola and an appraisal of recent critical studies of his work.

Seminar (2 hrs.); one term

Prerequisite: 18 units of French and registration in a programme in French; or permission of the Department.

French 4N03 may be repeated, if on a different topic, to a total of six units.

FRENCH 4O03 TWENTIETH-CENTURY FRENCH THEATRE

A study of the ideas and dramatic techniques of the playwrights of the modern period who have influenced the development of today's theatre in France.

3 lects.; one term

Prerequisite: 18 units of French and registration in a programme in French; or permission of the Department.

FRENCH 4Q03 TOPICS IN SEVENTEENTH-CENTURY FRENCH LITERATURE

1989-90: French Classical Theatre

An exploration of the themes and techniques of classical dramaturgy in the theatre of Corneille, Racine and Molière.

Seminar (2 hrs.); one term

Prerequisite: French 3Q03, and registration in a programme in French; or permission of the Department.

French 4Q03 may be repeated, if on a different topic, to a total of six units.

FRENCH 4R03 STUDIES IN MEDIEVAL FRENCH LITERATURE

A survey of medieval French literature: songs and poetry of the troubadours and trouvères; selections from the *Chanson de Roland*, Chrétien de Troyes' romances and other narrative works (lais, *Roman de la Rose*, *Roman de Renart*, fabliaux), and from secular theatre. Modernized French versions will be used. Selected texts in Old French will be analyzed.

Seminar (3 hrs.); one term

Prerequisite: 18 units of French and registration in a programme in French; or permission of the Department.

Not offered in 1989-90.

FRENCH 4T03 INDEPENDENT STUDY

The student will prepare under the supervision of a faculty member a research paper involving independent research in an area of study in which the student has already demonstrated a high level of basic knowledge.

Prerequisite: Registration in Level IV of an Honours programme in French and permission of the French 4T03 Committee.

FRENCH 4U03 TOPICS IN FRENCH-CANADIAN LITERATURE

1989-90: Folktales of French Canada

The structural, social and psychological study of traditional French-Canadian folktales and their relation to modern short stories.

Seminar (2 hrs.); one term

Prerequisite: 18 units of French including 2F03 or 2FF3, and registration in a programme in French; or permission of the Department.

French 4U03 may be repeated, if on a different topic, to a total of 6 units.

FRENCH 4X03 LINGUISTICS AND MODERN FRENCH LITERARY CRITICISM (FROM STRUCTURALISM TO SEMIOTICS)

General linguistics applied to literary analysis. Includes narrative structures, pragmatics and sign theory.

Seminar (2 hrs.); one term

Prerequisite: 18 units of French and registration in a programme in French; or permission of the Department.

FRENCH 4Y03 TOPICS IN TWENTIETH-CENTURY FRENCH LITERATURE

1989-90: Poetry of the Object in Twentieth-Century France

Close study of selected poems of Apollinaire, Reverdy, Ponge, Jaccottet and others.

Seminar (2 hrs.); one term

Prerequisite: 18 units of French and registration in a programme in French; or permission of the Department.

French 4Y03 may be repeated, if on a different topic, to a total of six units.

FRENCH 4Z03 THE DEVELOPMENT OF THE ROMANCE LANGUAGES

A general introduction to the history and present state of the principal Romance Languages (French, Italian and Spanish). The course will trace the evolution of sound systems (phonology), forms (morphology) and sentence structures (syntax) through a study of representative texts.

3 lects.; one term

Prerequisite: Registration in Level III or IV of a French programme.

Not offered in 1989-90.

Same as Italian 4Z03.

Geography

Faculty as of January 15, 1989

S.B. McCann/*Chairman*
S.M. Taylor/*Associate Chairman*

Professor Emeritus

Lloyd G. Reeds/M.A., Ph.D (*Toronto*)

Professors

Brian T. Bunting/M.A. (*Sheffield*), Ph.D. (*London*)
Andrew F. Burghardt/A.B. (*Harvard*), M.A., Ph.D. (*Wisconsin*)
John A. Davies/B.A. (*Bristol*), M.Sc. (*McGill*), Ph.D. (*London*)
John J. Drake/M.A. (*Oxford*), M.Sc., Ph.D. (*McMaster*)
Derek C. Ford/M.A., D.Phil. (*Oxford*)
R. Louis Gentilcore/B.A. (*Toronto*), Ph.D. (*Maryland*)
Frederick L. Hall/A.B. (*Amherst*), M.Sc. (M.I.T.), Ph.D. (*Chicago*)/ Professor of Civil Engineering and Engineering Mechanics
Leslie J. King/M.A. (*New Zealand*), Ph.D. (*Iowa*), F.R.S.C.
Kao-Lee Liaw/B.S. (*National Taiwan*), M.A. (*Kansas State*), Ph.D. (*Clark*)
S. Brian McCann/B.Sc. (*Wales*), Ph.D. (*Cambridge*)
Yorgos Y. Papageorgiou/Dipl. Arch. Eng. (*National Technical, Athens*), M.C.P., Ph.D. (*Ohio State*)
Wayne R. Rouse/B.Sc. (*McMaster*), M.Sc., Ph.D. (*McGill*)
S. Martin Taylor/B.A. (*Bristol*), M.A., Ph.D. (*British Columbia*)
Ming-ko Woo/M.A. (*Hong Kong*), Ph.D. (*British Columbia*)

Associate Professors

John Eyles/B.A., M.Sc. (*L.S.E.*) Ph.D. (*London*)
Stephen C. Lonergan/B.S. (*Duke*), M.A. (*Miami*), M.A., Ph.D., (*Pennsylvania*)
G.M. MacDonald/B.A. (*Berkeley*), M.Sc. (*Calgary*), Ph.D. (*Toronto*)

Assistant Professors

William P. Anderson/M.A., Ph.D. (*Boston*)
Vera Chouinard/B.A. (*Western*), M.A. (*Toronto*), Ph.D. (*McMaster*)

Lecturer

Steven Reader/B.Sc., Ph.D. (*Bristol*)

Associate Member

Norman F. White/M.D.C.M. (*McGill*), D.Psych. (*McGill*), F.R.C.P. (C) (*Royal College*)

Instructional Assistants

Walter Peace/M.A. (*McMaster*)
Michael Robinson/ (*Brock*)

Department Notes:

1. ★ Indicates a Science course.
2. Students are advised that not all courses will be offered in every year and should consult the *Handbook for Undergraduate Geographers*.

GEOG 1A06★ PHYSICAL GEOGRAPHY
An introduction to the geographical environment, emphasizing processes and patterns in weather and climate, landforms, plant and animal distributions, surface waters and soils.
2 lects., 1 lab. (2) alternate weeks, 1 tut. (1) alternate weeks; two terms
Prerequisite: Open.

GEOG 1B06 HUMAN GEOGRAPHY
The spatial organization of people, their settlements and their activities. Topics range from global patterns of population and resources to individual spatial decisions.
2 lects., 1 lab. (2) alternate weeks, 1 tut. (1) alternate weeks; two terms
Prerequisite: Open.

GEOG 2A03 LOCATIONAL ANALYSIS
An examination of modern methods of locational analysis and consideration of patterns that emerge in retailing and public service facilities from decisions based on such methods.
2 lects.; 1 lab. (2); one term
Prerequisite: Geography 1B06.

GEOG 2B03 URBAN GEOGRAPHY
Concepts and methods of economic geographical analysis applied to problems at the inter- and intra-urban levels. Topics include urbanization, city systems and structure and such issues as pollution, congestion and prejudice.
3 lects.; one term
Prerequisite: Geography 1B06, or permission of the instructor.

GEOG 2C03 CHINA: PEOPLE AND LAND IN TRANSITION.
Studies of the natural environment, cultural-historical setting, resources and economic development of China. Emphasis is placed upon the changing relationship between the people and the environment.
3 lects., one term
Prerequisite: Open.

GEOG 2D03 THE GEOGRAPHY OF SETTLEMENT
An examination of the geographical development of settlement, with particular reference to Old World origins and the beginnings of European settlement in North America.
2 lects., 1 lab. (2); one term
Prerequisite: Open.

GEOG 2E03 CANADA
The geography of Canada emphasizing the economic and social geography of regions and current development issues.
3 lects.; one term
Prerequisite: Open. Not available to students who have received credit for Geography 2H03.

GEOG 2F03★ EARTH'S SURFACE CLIMATES
The surface heat and water balance of natural and man-modified landscapes.
2 lects., 1 lab. (2); one term
Prerequisite: Geography 1A06, or permission of the instructor.

GEOG 2K03★ INTRODUCTION TO SOIL AND LAND USE STUDIES
The composition, morphology, and environmental relationships of soils and their use and abuse by man.
3 lects.; one term
Prerequisite: Geography 1A06, or a Level I Science course, or permission of the instructor.

GEOG 2LL3★ GEOGRAPHIC INFORMATION PROCESSING
An introduction to the use of the microcomputer to acquire, manipulate, analyse, illustrate and report geographical data.
Prerequisite: Registration in a Geography programme with at least a C− in Geography 1A06 or 1B06, and C− in six other units.

GEOG 2L03★ STATISTICAL ANALYSIS IN GEOGRAPHY
The use of geographical data in hypothesis testing and parameter estimation. Probability, distributions, significance tests, simple linear regression and error analysis.
Prerequisite: Geography 2LL3 and registration in a Geography programme; or permission of the Department. Not available to students with credit in Geography 2L06.

GEOG 2P03 THE UNITED STATES OF AMERICA
The physical and economic geography of the United States.
3 lects.; one term
Prerequisite: Open.

GEOG 2R03 BEHAVIOURAL GEOGRAPHY
Introduction to environmental cognition and human spatial behaviour.
2 lects., 1 lab. (2); one term
Prerequisite: Geography 1B06, or permission of the instructor.

GEOG 2T03★ FLUVIAL GEOMORPHOLOGY
The effects of moving water on the earth's surface: principles of sediment entrainment, fluvial flow, stream transport, and analysis of resulting landforms, such as terraces and deltas.
2 lects., 1 lab. (2); one term
Prerequisite: Geography 1A06, or one of Geology 1A03, 1C03 or 1A06, or permission of the instructor.

GEOG 2U03 ENVIRONMENTAL SCIENCE I
An examination of the interrelationships among the physical, biological, economic and institutional dimensions of environmental problems.
2 lects., 1 lab (2); one term
Prerequisite: Geography 1A06 or 1B06, or a Level I Science course; or permission of the instructor.

GEOG 2W03★ HYDROLOGY IN CANADA
A discussion of fresh water resources, including both surface and groundwater.
3 lects.; one term
Prerequisite: Geography 1A06, or one of Geology 1A03, 1C03 or 1A06.

GEOG 2Y03 URBAN AND REGIONAL DEVELOPMENT
Recent trends in urban and regional development, emphasizing issues of change in the spatial structure of central cities, suburbs and regions.
2 lects.; 1 tut. (1); one term
Prerequisite: Geography 1B06, or permission of instructor.

GEOG 3B03 EUROPE
The physical, economic, social and political geography of Europe, past and present.
3 lects.; one term
Prerequisite: Open.

GEOG 3C03 ENVIRONMENTAL HAZARDS
Geological and man-induced hazards affecting settlements and the natural environment will be discussed.
2 lects., 1 lab.; one term
Prerequisite: Geography 2U03, or permission of the instructor.
First offered in 1990-91.

GEOG 3D03 HISTORICAL GEOGRAPHY OF CANADA
Major themes in the historical geography of Canada, with particular reference to settlement changes in the 19th century.
3 lects.; one term
Prerequisite: One of Geography 2D03, 2E03, 2H03, or permission of the instructor.

GEOG 3E03* FIELD STUDY IN PHYSICAL GEOGRAPHY
Field study experiments and survey design, data collection methods and data processing. Offered in the summer following Level II. Details are announced in January.
Prerequisite: Geography 2LL3 or 2L06, and permission of the Department.

GEOG 3EE3 FIELD STUDY IN HUMAN GEOGRAPHY
Introduction to field study design, data collection methods and data processing. Offered in the summer following Level II. Details announced in January.
Prerequisite: Geography 2L03 or 2L06, and permission of the Department.

GEOG 3F03* PHYSICAL CLIMATOLOGY
The physical basis of large scale climate and mechanisms of climatic change.
2 lects., 1 lab. (2); one term
Prerequisite: Geography 2F03, and Geography 2LL3 or Computer Science 1B03 or 1MA3, or registration in a programme in the Faculty of Science.

GEOG 3G03 POPULATION GROWTH AND DISTRIBUTION
Facts, theories, and major issues about the growth and distribution of human population.
3 lects.; one term
Prerequisite: Geography 1B06, or permission of the instructor.

GEOG 3I03* PLANETARY AND LUNAR GEOLOGY AND GEOMORPHOLOGY
The geology and surface morphology of planets and moons of the solar system, with particular reference to the rocky bodies. Comparative studies are emphasized.
3 lects.; one term
Prerequisite: Geography 1A06, or one of Geology 1A03, 1C03, or 1A06, and completion of at least 12 units of Level II (or higher) Science courses; or permission of the instructor.
Same as Geology 3I03.

GEOG 3J03 RESOURCE MANAGEMENT
A discussion of natural resource scarcity, resource allocation, preservation/conservation issues, models of resource management and resource policies in Canada.
2 lects., 1 lab.; one term
Prerequisite: Geography 2U03, or permission of the instructor.
First offered 1990-91.

GEOG 3K03* SOILS AND RURAL LAND USE IN CANADA
The development of the major soil forms in Canada, their classification, capability and conservation. The application of soils studies to land use planning.
2 lects.; 1 lab. (2); one term
Prerequisite: Geography 2K03, or permission of the instructor.

GEOG 3L03* MULTIVARIATE ANALYSIS IN GEOGRAPHY
The management of geographical data, using SAS, to perform multiple regression, cluster and principal component analysis. Real-world data from both human and physical geography will be used.
2 lects., 1 lab. (2); one term
Prerequisite: Geography 2L03 or 2L06, and Mathematics 1A06 or 1M03, or permission of the instructor.

GEOG 3M03* GLACIAL AND PERIGLACIAL GEOMORPHOLOGY
The nature and development of glaciers, glacial landform systems and periglacial processes.
2 lects., 1 lab. (2); one term
Prerequisite: Geography 2T03, or permission of the instructor.

GEOG 3NN3* PRINCIPLES OF COMPUTER CARTOGRAPHY AND GEOGRAPHIC INFORMATION SYSTEMS
An introduction to the design features and analytical capabilities of automated cartography packages and geographic information systems.
2 lects.; 1 lab. (2)
Prerequisite: Geography 2L03

GEOG 3O03 EXPLANATION IN GEOGRAPHY
The application of the scientific model of explanation in geographic research, with emphasis on the principles of research design.
2 lects., 1 sem. (2); one term
Prerequisite: Geography 2L03 or 2L06.

GEOG 3P03* BIOGEOGRAPHY: DISTRIBUTION OF PLANTS AND ANIMALS
An introduction to the concepts of biogeography. Emphasis is placed on the physical and biological factors which control the spatial and temporal distribution of plants and animals.
3 lects.; one term.
Prerequisite: Geography 1A06, or Biology 1A06, or permission of the instructor.

GEOG 3Q03 INDUSTRIAL GEOGRAPHY
Principles underlying the locational decisions of manufacturing firms and the growth and decline of industrial regions with examples from the Hamilton area.
2 lects., 1 lab.; one term.
Prerequisite: Geography 1B06, or permission of the instructor.

GEOG 3R03 GEOGRAPHY OF A SELECTED WORLD REGION
The study of an area outside North America and Europe which will include topics in physical and human geography.
3 lects.; one term.
Prerequisite: Open.
Geography 3R03 may be repeated, if on a different topic, with permission of the Department.

GEOG 3T03 GEOGRAPHY OF PLANNING
A systematic approach to the study of the planning process, with emphasis on analysis of the social, economic, and political bases of planning.
2 lects., 1 lab. (2); one term
Prerequisite: One of Geography 2A03, 2B03, 2R03 or 2Y03; or permission of the instructor.

GEOG 3U03 ENVIRONMENTAL SCIENCE II: THE CANADIAN CONTEXT
The application of ecological principles and methods to the analysis of problems in the natural and built environment of Canada.
2 lects., 1 lab.; one term
Prerequisite: Geography 2U03, or permission of the instructor.
First offered 1990-91.

GEOG 3V03* REMOTE SENSING
The physical principles of remote sensing, with emphasis on aerial photographs and satellite imagery. Visual and digital interpretation procedures and their application in geography.
2 lects., 1 lab. (2); one term
Prerequisite: One of Geography 1A06, 1B06, Geology 1A03, 1C03, 1A06; or permission of the instructor.

GEOG 3W03* HYDROLOGY
Principles of hydrology and their applications in physical geography.
2 lects., 1 lab. (2); one term
Prerequisite: Geography 1A06, and Geography 2L03 or 2L06, or permission of the instructor.

GEOG 3X03 URBAN MODELS AND POLICY ANALYSIS I
A survey of modem literature on urban spatial structure. Topics include morphology, adjustments to change, and such phenomena as sudden urban growth and the decline of central cities.
3 lects.; one term
Prerequisite: Geography 2B03, 2L03 or 2L06, or permission of the instructor.

GEOG 3Z03 POLITICAL GEOGRAPHY
An introduction to the concepts and methods of political geography, with particular emphasis on the state and its administrative subdivisions.
3 lects.; one term
Prerequisite: Registration in Level III or IV of any programme, or permission of the instructor.

GEOG 4A03* KARST GEOMORPHOLOGY AND HYDROGEOLOGY
Karst rocks, equilibria and kinetics of their aqueous dissolution; cavern genesis and porosity in aquifers; speleothem chronology; features of surface landforms; practical applications.
3 lects.; one term
Prerequisite: Geography 2T03, or permission of the instructor.

GEOG 4C06 RESEARCH PAPER
The student will select a study in geography and have it approved by a Faculty Supervisor, normally prior to May 1. The final report of the project is due by April 1 of the following year.
1 seminar (2) alternate weeks; two terms
Prerequisite: Geography 3O03, and registration in Level IV of an Honours programme in Geography.

GEOG 4D03* COASTAL GEOMORPHOLOGY
The dynamics and morphologies of the shore zone.
2 lects., 1 lab.; one term
Prerequisite: Geography 3M03, or permission of the instructor.

GEOG 4E03* FIELD COURSE
Detailed study of a particular aspect of physical geography in the field. Held in the two weeks prior to fall registration; report to be submitted before the end of first term. Various topics and locations: details announced in March.
Prerequisite: Permission of the instructor, which is given only if the appropriate Level II and Level III courses have been passed.

GEOG 4F03 URBAN DEVELOPMENT AND POLICY ISSUES
Current debates on urban development and policy issues. Emphasis on the political economy of urban change.
3 lects.; one term.
Prerequisite: Geography 2Y03, or permission of the instructor.

GEOG 4H03* LAND USE AND TRANSPORTATION
A review of quantitative models used to predict transportation flows and land use patterns in urban areas; including gravity type models, the Lowry model and discrete choice models.
3 lects.; one term.
Prerequisite: One of Geography 3NN3, 2L03 or 2L06, or permission of the instructor.
Same as Civil Engineering 4H03.

GEOG 4J03 URBAN BEHAVIOURAL GEOGRAPHY
An examination of selected topics in human spatial behaviour. Strong emphasis is on behavioural research and analysis methods.
2 lects., 1 lab. (2); one term
Prerequisite: Geography 2R03 and 3O03, or permission of the instructor.

GEOG 4K03* PEDOLOGY AND SOIL MICROMORPHOLOGY
Studies of soil genesis and soil micromorphology; examination of soils under the microscope.
3 lects.; one term
Prerequisite: Geography 2K03 or 3K03, or permission of the instructor.

GEOG 4N03* APPLIED GEOGRAPHIC INFORMATION SYSTEMS
Application of GIS to geographical problem solving using advanced spatial analysis, space-time modelling and process simulation in a practical way.
2 lects.; 1 lab (2)
Prerequisite: Geography 3NN3, or permission of the instructor.

GEOG 4P03* ADVANCED BIOGEOGRAPHY
Selected topics and methods in biogeographical research. Emphasis is placed on the collection and quantitative analysis of modern and fossil phytogeographical data.
2 lects., 1 lab. (2); one term.
Prerequisite: Geography 3P03, or Biology 2F03, or permission of the instructor.
Offered 1988/89 and in alternate years.

GEOG 4Q03* CLIMATES IN HIGH LATITUDES
Aspects of the heat and water balance climatology of terrestrial ecosystems in northern areas, with emphasis on the Canadian sub-arctic and tundra.
3 lects.; one term
Prerequisite: Geography 2F03, or permission of the instructor.

GEOG 4R03* MODELS IN CLIMATOLOGY
Discussion of global climatic models and their application.
3 lects.; one term
Prerequisite: Geography 3F03 and one of Mathematics 1A06 or 1M03, or permission of the instructor.

GEOG 4S03 GEOGRAPHY OF HEALTH CARE
The environmental determinants of health and the spatial dimensions of health care delivery.
2 seminars; one term
Prerequisite: Registration in Level IV of an Honours programme, or permission of the instructor.

GEOG 4T03 REGIONAL ANALYSIS AND PLANNING
The use of analytical methods in assessing the environmental and socio-economic impacts of regional planning policies with particular reference to developing countries.
2 lects., 1 lab. (2); one term
Prerequisite: Geography 3T03, or permission of the instructor.

GEOG 4U03 SELECTED PROBLEMS IN URBAN PLANNING
An examination of planning as a public decision process, with emphasis on land use conflicts and their resolution in the Hamilton region.
2 seminars (2); one term
Prerequisite: Geography 3T03.

GEOG 4V06 ADVANCED STUDIES IN ENVIRONMENTAL SCIENCE
Selected issues and problems in environmental science will be researched and discussed.
1 seminar (2); two terms
Prerequisite: Geography 3U03
First offered 1991-92.

GEOG 4W03* HYDROLOGIC MODELLING
A survey of deterministic and stochastic models in hydrology.
2 lects., 1 lab. (2); one term
Prerequisite: Geography 3W03, or permission of the instructor.

GEOG 4X03 URBAN MODELS AND POLICY ANALYSIS II
A survey of modern literature on urban issues. Topics include welfare criteria, externalities, public goods and fiscal policies.
3 lects.; one term
Prerequisite: Geography 3X03, or permission of the instructor.

GEOG 4Z03 THE URBAN LANDSCAPE
The role of culture in the Canadian urban community viewed through the study of the built environment in the Hamilton area.
2 seminars (2); one term
Prerequisite: Registration in Level IV of any Honours programme, or permission of the instructor.

For **Graduate Courses** see *Calendar of School of Graduate Studies.*

Geology

Faculty as of January 15, 1989

H.P. Schwarcz/*Chairman*

Professor Emeritus

Gerd E.G. Westermann/B.Sc. (*Braunschweig*), Dipl. Geol., Dr. rer. nat. (*Tubingen*)

Professors

Brian J. Burley/B.Sc. (*London*), M.Sc. (*British Columbia*), Ph.D. (*McGill*)
Paul M. Clifford/B.Sc. (*Southampton*), Ph.D. (*London*)
James H. Crocket/B.Sc. (*New Brunswick, Oxford*), Ph.D. (*M.I.T.*)
H. Douglas Grundy/B.Sc., Ph.D. (*Manchester*)
James R. Kramer/B.Sc. (*M.I.T.*), M.Sc., Ph.D. (*Michigan*)
Robert H. McNutt/B.Sc. (*New Brunswick*), Ph.D. (*M.I.T.*)
Gerard V. Middleton/B.Sc., A.R.C.S., Ph.D., D.I.C. (*London*), F.R.S.C.
Michael J. Risk/B.Sc. (*Toronto*), M.Sc. (*Western*), Ph.D. (*Southern California, L.A.*)
Henry P. Schwarcz/B.A. (Chicago), M.S., Ph.D. (*California Institute of Technology*), F.R.S.C.
Denis M. Shaw/B.A., M.A. (*Cambridge*), Ph.D. (*Chicago*), F.R.S.C.
Roger G. Walker/B.A., D.Phil. (*Oxford*), F.R.S.C.

Associate Professor

Alan P. Dickin/M.A. (*Cambridge*), D. Phil. (*Oxford*)

Assistant Professor

Christopher J. Hale/B.Sc. (*Toronto*), M.A. (*California, S.B.*), Ph.D. (*Toronto*)

GEOLOGY 1A03 SURVEY OF GEOLOGICAL SCIENCES
An introduction to the physical and chemical processes which are operative within and upon the earth. Laboratory work includes the study of minerals, rocks, fossils and geological maps.
2 lects., 1 lab (3); one term
Prerequisite: Open

GEOLOGY 1C03 EARTH PROCESSES
An introduction to geology through study of dynamic geological processes, particularly global plate tectonics.
2 lects., 1 lab (3); one term
Prerequisite: Open

GEOLOGY 2B04 OPTICAL CRYSTALLOGRAPHY AND MINERALOGY
Elementary optical theory with applications to, and descriptive study of, the common rock-forming minerals. The latter part of Geology 2B06.
2 lects., 1 lab. (2); in parts of both terms
Prerequisite: Open only to students registered in Ceramic Engineering; or permission of instructor.

GEOLOGY 2B06 OPTICAL CRYSTALLOGRAPHY AND MINERALOGY
Elementary crystallography prerequisite to optical crystallography. Elementary optical theory with applications to, and descriptive study of, the common rock-forming minerals.
2 lects., 1 lab. (2); two terms
Prerequisite: Registration in a Geology programme; or permission of the Department.

GEOLOGY 2C03 EARTH HISTORY
The principles of stratigraphy and continental evolution, as illustrated by the geology of Ontario and other classic localities.
2 lects., 1 lab. (3); one term
Prerequisite: Geology 1A03 or 1C03; or permission of the instructor. Not open to students with credit in Geology 2C06.

GEOLOGY 2D06 STRUCTURAL GEOLOGY I
A study of inherent and imposed structures in rocks, their inter-relationships, and their modes and environments of formation.
2 lects., 1 lab. (3); two terms.
Prerequisite: Geology 1A03 or 1C03.
Last offered in 1990-91.

GEOLOGY 2DD3 INTRODUCTION TO STRUCTURAL GEOLOGY I
Introduction to the study of geometry of structures in rocks. Laboratory work involves manipulation of geometric data from such structures.
2 lects., 1 lab. (3); one term
Prerequisite: Geology 1A03 or 1C03. Geology 2DD3 is equivalent to the first term of Geology 2D06. Not open to students who are registered in or have credit in Geology 2D06.

GEOLOGY 2E01 HAND SPECIMEN PETROGRAPHY
An introduction to the study of rock suites in hand specimen with emphasis on field associations.
1 lab. (2); one term
Prerequisite: Geology 1A03 or 1C03

GEOLOGY 2I03 INTRODUCTION TO GEOPHYSICS

Introduction to the quantitative study of the earth. Origin of the earth, solar system, gravitation, geomagnetic field, terrestrial heat flow and elements of seismology.

3 lects.; one term

Prerequisite: One of Physics 1A06, 1B06, or 1C06, and registration in a Geology programme; or permission of the instructor.

GEOLOGY 2J03 INTRODUCTORY PALEONTOLOGY

Uses of paleontology; importance in geologic time and organic evolution; origin of life; adaptation and functional morphology; major groups of economicaly important fossils; stratigraphy.

2 lects., 1 lab. (3); one term

Prerequisite: Geology 1A03 or 1C03; or permission of the instructor. Geology 2J03 is equivalent to the first term of Geology 3D06. Not open to students who are registered in or have credit in Geology 3D06.

GEOLOGY 3A03 APPLIED GEOPHYSICS A

Principles and uses of electrical, magnetic, electromagnetic and radioactivity-based techniques in exploration geophysics; borehole logging methods.

2 lects., 1 lab. (2); one term

Prerequisite: Geology 2I03; or permission of the instructor.

Alternates with Geology 3B03.

Offered in 1989-90.

GEOLOGY 3B03 APPLIED GEOPHYSICS B

Gravitational and seismic principles and methods and their use in exploration geophysics.

2 lects., one lab. (2); one term

Prerequisite: Geology 2I03; or permission of the instructor.

Alternates with Geology 3A03.

Offered in 1990-91.

GEOLOGY 3C06 PETROGRAPHY

A sequel to Geology 2B06. An introductory course in the petrology of igneous, sedimentary, and metamorphic rocks. Laboratory studies on rock suites.

2 lects., 1 lab. (2); two terms

Prerequisite: Geology 2B06.

Last offered in 1989-90.

GEOLOGY 3CC6 IGNEOUS AND METAMORPHIC PETROGRAPHY

A sequel to Geology 2B06. An introductory course in the petrography of igneous and metamorphic rocks including some discussion of their origin. Laboratory studies on rock suites.

2 lects., 1 lab (2); two terms

Prerequisite: Geology 2B06. Not open to students with credit in Geology 3C06.

First offered in 1990-91.

GEOLOGY 3D06 INTRODUCTORY PALAEONTOLOGY

Principles of palaeontology; the organization and evolution of life in the past, with emphasis on invertebrate fossils.

2 lects., 1 lab. (3); two terms

Prerequisite: One of Geology 1A03 or 1C03, and one of Biology 2E03 or 1A06; or permission of the instructor.

Last offered in 1990-91.

GEOLOGY 3DD3 INTRODUCTION TO STRUCTURAL GEOLOGY II

Introduction to interpretation of geological structures in terms of movements and mechanisms which gave rise to them. Laboratory emphasizes the link between geometry and deformation.

2 lects., 1 lab. (3); one term

Prerequisite: Geology 2DD3. Geology 3DD3 is equivalent to the second term of Geology 2D06. Not open to students with credit in Geology 2D06.

First offered in 1990-91.

GEOLOGY 3E02 FIELD CAMP

A field camp of about two weeks duration held immediately after the April-May Examinations. Normally taken immediately following Level II by students in all Geology and combined programmes.

Prerequisite: Geology 2E01 or permission of the Chairman.

GEOLOGY 3F03 SEDIMENTARY FACIES AND ENVIRONMENTS

A course in the field aspects of sedimentary rocks and the depositional environments of clastic and carbonate systems.

3 lects., one term

Prerequisite: Geology 2C03; or permission of the instructor.

First offered in 1990-91.

GEOLOGY 3G03 MINERALOGY

Topics in x-ray crystallography and mineralogy and an introduction to crystal chemistry; laboratory studies in physical and chemical properties of minerals.

2 lects., 1 lab. (3); one term

Prerequisite: Geology 2B06. Not open to students who are registered in or have credit in Geology 3G04.

First offered in 1990-91.

GEOLOGY 3G04 CRYSTALLOGRAPHY AND MINERALOGY

Topics in X-ray crystallography; an introduction to crystal chemistry and mineralogy; laboratory studies in the physical and chemical properties of minerals.

3 lects., 1 lab. (3); one term

Prerequisite: Geology 2B06.

Last offered in 1989-90.

GEOLOGY 3H03 GEOLOGICAL DATA PROCESSING

Nature of geological data; techniques of graphical presentation and data analysis, including use of microcomputers.

3 lects.; one term

Prerequisite: Registration in a Geology programme; or permission of the instructor. Not open to students with credit in Geology 2H03.

GEOLOGY 3I03 PLANETARY AND LUNAR GEOLOGY AND GEOMORPHOLOGY

The geology and surface morphology of planets and moons of the solar system with particular reference to the rocky bodies. Comparative studies are emphasized.

3 lects.; one term

Prerequisite: Geography 1A06, or one of Geology 1A03 or 1C03, and completion of at least 12 units of Level II (or higher) Science courses.

Same as Geography 3I03.

GEOLOGY 3J03 PALEONTOLOGY

Marine habitats and possible changes through geologic time. Groups of fossils important in stratigraphy including microfossils; economic paleontology.

2 lects., 1 lab. (3); one term

Prerequisite: Geology 2J03 and Biology 2E03; or permission of the instructor. Geology 3J03 is equivalent to the second term of Geology 3D06. Not open to students with credit in Geology 3D06.

First offered in 1990-91.

GEOLOGY 3Q03 INTRODUCTORY GEOCHEMISTRY

An introduction to the chemistry of the earth including cosmochemistry, global cycles, ocean chemistry, radiogenic and stable isotope systematics, geochronology, analytical techniques.

3 lects.; one term

Prerequisite: Chemistry 2P06; or permission of the instructor.

First offered in 1990-91.

GEOLOGY 3S03 SEDIMENTARY PETROLOGY

An introductory course in the petrology of sediments and sedimentary rocks. Laboratory includes textural analysis of sediments and examination of sedimentary rocks suites in hand specimen and thin section.

2 lects., 1 lab. (2); one term

Prerequisite: Geology 2B06

First offered in 1990-91.

GEOLOGY 4B03 IGNEOUS PETROLOGY

Advanced theory of igneous rocks.

3 lects., one term

Prerequisite: Geology 3C06, Materials 3D03; or permission of the instructor.

GEOLOGY 4BB3 METAMORPHIC PETROLOGY

Advanced theory and practice on metamorphic rocks.

2 lects., one lab (3); one term

Prerequisite: Geology 3C06, and one of Chemistry 2P06 or 2P04; or permission of the instructor.

GEOLOGY 4D03 ADVANCED PALAEONTOLOGY I

Surveys of selected living and fossil marine communities; marine habitats.

2 lects., 1 seminar; one term

Prerequisite: Geology 3D06 or completion of at least 12 units of Level III Biology.

GEOLOGY 4E06 METALLIC MINERAL DEPOSITS

Geology, isotopic geochemistry, and mineralogy of ore deposits; ore genesis.

2 lects., 1 lab. (3); two terms

Prerequisite: Registration in Level IV of a Geology programme; or permission of the instructor.

GEOLOGY 4F03 ADVANCED PALAEONTOLOGY II

Functional morphology (autecology) of selected fossil invertebrates.

Lectures and seminars; one term

Prerequisite: Geology 3D06 or completion of at least 12 units of Level III Biology.

GEOLOGY 4J03 PHYSICAL PROCESSES IN GEOLOGY

An introduction to the physics of continuous media. Stress and strain analysis, dimensional analysis, behavioural models for materials and laws of fluid motion applied to geological problems.

3 lects.; one term

Prerequisite: Geology 2I03; or permission of the instructor.

GEOLOGY 4K06 GEOLOGY THESIS

Prerequisite: Open to students in Level IV of a Geology programme subject to the approval of the Chairman of the Department.

GEOLOGY 4M03 SEDIMENTOLOGY: PHYSICAL PROCESSES

A first course in the principles of physical sedimentology.

3 lects.; one term

Prerequisite: Geology 2C06; or permission of the instructor.

GEOLOGY 4MM3 SEDIMENTOLOGY: CHEMICAL PROCESSES

A review of equilibrium models and surface reactions. Topics covered are weathering, carbonate systems, evaporites, clays, iron minerals, phosphates, and diagenesis.

3 lects.; one term

Prerequisite: Geology 2C06, and one of Chemistry 2P04, 2P06, 2T03, 2T05, 2T06; or permission of the instructor.

GEOLOGY 4N03 STRUCTURAL GEOLOGY II

Principles of rock deformation as inferred from theory and experiment. These principles are applied to the study of actual geological structures on all scales.

3 lects.; one term

Prerequisite: Geology 2D05 or 2D06 and completion of, or registration in Geology 3C06.

Not offered in 1989-90. Alternates with Geology 4V03.

GEOLOGY 4Q03 GEOCHEMISTRY I

Geochemistry of the earth, rocks and magmas including earth composition, techniques of geochemical analysis, element distribution between crystals and magmas, geochronology, radiogenic and stable isotope geochemistry.

3 lects.; one term

Prerequisite: Chemistry 2P06, and completion of, or registration in, Geology 3C06.

GEOLOGY 4QQ3 GEOCHEMISTRY II

Thermodynamics and kinetic applications applied to the Earth's surface. Weathering, soil reactions, surface reactions, aqueous speciation, ocean chemistry, and global cycles are considered.

3 lects.; one term

Prerequisite: Chemistry 2P06 and completion of, or registration in, Geology 3C06.

GEOLOGY 4S03 PHYSICAL OCEANOGRAPHY

Energy budget of the ocean; optical oceanography, ocean dynamics. Examples for the Great Lakes.

3 lects.; one term

Prerequisite: Completion of at least 15 units of Level III Science courses; or permission of the instructor.

GEOLOGY 4T03 PLATE TECTONICS

Principles of plate tectonics, with application to regional and historical geology.

3 lects.; one term

Prerequisite: Geology 2C06; completion of, or registration in Geology 3C06.

GEOLOGY 4U03 GEOLOGY OF FOSSIL FUELS

Organic matter in sediments and how it is converted into accumulations of coal or petroleum. Exploration and production techniques. Canadian case histories.

3 lects.; one term

Prerequisite: Geology 2C06.

GEOLOGY 4V03 PHYSICAL VOLCANOLOGY

Physical modes of eruption of volcanoes and the products of such eruptions. Interpretation of ancient rocks in the light of modern volcanic rocks.

2 lects.; one term

Prerequisite: Completion of, or registration in Geology 3C06.

Alternates with Geology 4N03.

For **Graduate Courses** see *Calendar of School of Graduate Studies.*

German

Courses and programmes in *German* are administered within the Department of Modern Languages of the Faculty of Humanities.

Faculty as of January 15, 1989

Professor Emeritus

Karl Denner/M.A. (*Kentucky*), Ph.D. (*Johns Hopkins*)

Professors

Gerhart Teuscher/Dipl.-Uebersetzer *(Mainz-Germersheim)*, M.A. *(Toronto)*, Ph.D. *(State University of New York, Buffalo)*

Associate Professors

C. Gerald Chapple/B.A. *(McMaster)*, A.M., Ph.D. *(Harvard)*
James B. Lawson/B.A. *(New York State College for Teachers, Albany)*, M.A. *(Johns Hopkins)*
Hans H. Schulte/Assessor *(Munich)*, Dr.phil. *(Augsburg)*
Robert L. Van Dusen/B.A. *(Harvard)*, M.A., Ph.D. *(Texas)*
Fritz T. Widmaier/B.A. *(Waterloo)*, A.M., Ph.D. *(Southern California)*

Assistant Professor

Maria M. Stroińska/M.A. *(Warsaw)*, Ph.D *(Edinburgh)*

Department Notes:

1. Students are strongly advised to take History 3J06 as an elective.
2. German 1Z06, 2Z06, 3Z03, and 3ZZ3 constitute a series of intensive language courses. The completion of German 3ZZ3 with a grade of at least A –, by non-programme students, results in a transcript notation indicating that the student has completed a series of intensive German language courses and has acquired a good working knowledge of spoken and written German.

Beginner's Language Course

GERMAN 1Z06 BEGINNER'S INTENSIVE GERMAN

This course is designed to give students the ability to express themselves reasonably well in German. In addition, they will acquire the basics of German grammar and considerable reading skill. Small tutorial groups will ensure maximum participation by each student. Laboratory practice is an integral part of the course.

4 hrs.; two terms

Prerequisite: Open, except to graduates of Grade 12 or Grade 13 or OAC German. Students with prior knowledge of the language as determined by an interview may be required to take German 2Z06.

Intermediate and Advanced Language and Literature Courses

GERMAN 1A06 INTRODUCTION TO GERMAN STUDIES

Lectures outline the development of German literature against its cultural background. Tutorials involve grammar, lab practice and class reading of literary texts. Lectures and literature tutorials in German; written reports in German and English.

4 hrs.; two terms

Prerequisite: Grade 13 or OAC German; or Grade 12 German (with a grade of at least 80%) and permission of the department. Not available to students with credit in or registered in German 2Y06.

GERMAN 2A03 MODERN GERMAN LITERATURE

A discussion of works and authors from Naturalism to the 1960's (Hauptmann to Böll).

3 lects.; one term

Prerequisite: German 1A06 or 2Y06; or permission of the Department.

GERMAN 2B03 19TH-CENTURY LITERATURE

Analysis and discussion of works from major 19th-century literary movements.

3 lects.; one term

Prerequisite: German 1A06 or 2Y06; or permission of the Department. Not available to students with credit in German 3BB3 or 3D03.

GERMAN 2E03 GERMAN GRAMMAR

A systematic review, including translation and oral practice.

3 hrs.; one term

Prerequisite: One of German 1A06, 2Y06 or 2Z06; or permission of the Department.

GERMAN 2G03 GERMAN LANGUAGE PRACTICE

A course designed to cover both the spoken and written language.

3 hrs.; one term

Prerequisite: One of German 1A06, 2Y06, 2Z06; or permission of the Department.

GERMAN 2Y06 THE GERMAN LITERARY TRADITION

Study and interpretation of texts from all periods of German literature. Papers in German and speech laboratory will allow further pursuit of grammatical and oral skills.

4 hrs.; two terms

Prerequisite: German 1Z06 with a grade of at least B – and permission of the Department. Not available to students with credit in or registered in German 1A06.

GERMAN 2Z06 INTERMEDIATE INTENSIVE GERMAN

Conversation practice and writing assignments, review of grammatical structures, expansion of vocabulary, and extensive reading of original German texts. Laboratory practice is an integral part of the course. Small tutorial groups ensure maximum participation by each student.

4 hrs.; two terms

Prerequisite: Grade 12 German (with a grade less than 80%) or German 1Z06 (with a grade of at least B –); or permission of the Department.

GERMAN 3A03 BAROQUE AND ENLIGHTENMENT LITERATURE

Discussion of selected works from the beginning of the 17th to the end of the 18th centuries within their historical and intellectual contexts.

3 lects.; one term

Prerequisite: 18 units of German or permission of the Department.

GERMAN 3B03 'STURM UND DRANG' AND CLASSICISM

Works representative of Storm and Stress and the early Classical period:

3 lects.; one term

Prerequisite: 18 units of German or permission of the Department.

GERMAN 3Z03 ADVANCED ORAL AND WRITTEN LANGUAGE PRACTICE I

A practically-oriented course designed to increase the student's facility in using German as a means of oral and written communication. Students will be required to express their views on a variety of topics in written assignments and subsequent class discussions. Extensive reading will expand the students' vocabulary and improve general language ability.

3 lects.; one term

Prerequisite: One of German 2Z06 (with a grade of at least A –), 2E03, 2G03; or permission of the Department.

GERMAN 3ZZ3 ADVANCED ORAL AND WRITTEN LANGUAGE PRACTICE II

A continuation of the approach used in German 3Z03.

3 lects.; one term

Prerequisite: German 3Z03 (with a grade of at least B) or permission of the Department.

GERMAN 4A03 GERMAN LYRIC POETRY
An examination of German lyric poetry as it reflects the changing styles and the main trends of literary expression in Germany from the 17th to the 20th century.
3 lects.; one term
Prerequisite: 18 units of German or permission of the Department.

GERMAN 4C03 ADVANCED LANGUAGE PRACTICE
The emphasis is on composition and oral expression.
3 hrs.; one term
Prerequisite: German 3Z03 or 3ZZ3; or permission of the Department.

GERMAN 4CC3 TRANSLATION: TECHNIQUES AND PRACTICE
Practice in the translation of texts of a literary and non-literary nature. (English to German and German to English).
3 hrs.; one term
Prerequisite: German 3Z03 or 3ZZ3; or permission of the Department.

GERMAN 4G03 THE ROMANTIC MOVEMENT
From Weimar Classicism to Romanticism, with emphasis on the works of the Romantic Period from Novalis through Heine.
3 lects.; one term
Prerequisite: 18 units of German or permission of the Department.

GERMAN 4I03 INDEPENDENT STUDY
Under the supervision of a faculty member, the student will prepare a research paper involving independent study in an area in which the student has demonstrated competence.
Prerequisite: Registration in Level IV of a German programme, and permission of the departmental Independent Study Committee.

GERMAN 4X03 SPECIAL TOPICS IN GERMAN LITERATURE
1989-90: The German Novella
3 lects.; one term
Prerequisite: 18 units of German or permission of the Department.
German 4X03 may be repeated, if on a different topic, to a total of 6 units.

GERMAN 4Z03 PRINCIPLES OF TEACHING AND LEARNING A SECOND LANGUAGE
An examination of various aspects of second language acquisition as applied to the teaching of German.
Seminar (2 hrs.); weekly in first term, bi-weekly in second term
Prerequisite: Registration in Level IV of a German programme and permission of the Department.

For **Graduate Courses** see *Calendar of School of Graduate Studies.*

Gerontology

Gerontology Programmes at McMaster University are administered by the Faculty of Social Sciences through the Office of Gerontological Studies, and are co-ordinated and supervised by an interdisciplinary Committee of Instruction.

Students wishing to register in a *programme* in Gerontological Studies must obtain *written approval* of the Chairman of the Committee of Instruction of Gerontology Programmes.

Committee of Instruction:

K. Kinanen (Social Work)/*Chairman*
A.E. Combs (Religious Studies)
D. Counts (Anthropology)
P. George (Dean) Ex-officio
A. Joshi (Gerontology)
A. Mann (Physical Education)
S. Meredith (Social Work/Gerontology)
O. Roman (Nursing)
E. Ryan (Psychiatry)
G. Singh (Oncology)
J. Synge (Sociology)
J. Thomas (Philosophy)
A. Treadwell (Social Sciences)
W. Torresin (Health Sciences)
G. West (Gerontology)

GERONTOL 1A06 INTRODUCTION TO GERONTOLOGY
An introduction to gerontology as a multidisciplinary study of aging, focusing on the philosophical, historical, biological, physiological, psychological, economic, social and health care aspects, as well as social policies in respect to an aging population.
3 hrs. (lects. and discussions); two terms
Prerequisite: Open.

GERONTOL 2A03 MULTIDISCIPLINARY ISSUES IN GERONTOLOGY
This course will examine the multidisciplinary nature of contemporary issues in the field of gerontology. Special attention will be given to the contributions of the cognate disciplines and the integration of gerontological knowledge.
3 hrs. (lects. and discussions); one term
Prerequisite: Gerontology 1A06 or Social Science 2G06, and registration in a Gerontology programme.

GERONTOL 2B03 BIOLOGICAL DIMENSIONS OF HUMAN AGING
An examination of age-related changes in biology and physiology of organisms with a special emphasis on human aging. Attention will be given to the gradual deterioration of function and homeostatic controls and the maintenance of optimal operation for various organs.
3 hrs. (lects.); one term
Prerequisite: Gerontology 1A06 or Social Science 2G06, and enrolment in a Gerontology programme; or permission of the instructor.

GERONTOL 3A03 INTERNATIONAL ASPECTS OF GERONTOLOGY
Issues in gerontology in selected developed and developing countries. The course focuses on demographic changes, social, political and economic implications of population change, attitudes toward the aged, health care and social policies.
3 hrs. (lects and discussions); one term
Prerequisite: Gerontology 1A06 or Social Science 2G06; or permission of the instructor.

GERONTOL 3B03 GERONTOLOGY FIELD EXPERIENCE
Directed practicum of 36 hours in an approved gerontology field experience and a weekly seminar focusing on integration of theoretical knowledge and practicum experience.
3 hrs. field experience per week, and 1 hr. weekly seminar; one term
Prerequisite: Registration in Level III or IV of any Gerontology programme.

GERONTOL 3C03 RESEARCH METHODS IN SOCIAL GERONTOLOGY
An introduction to conducting, interpreting, and applying research in social gerontology. Special attention to the problems associated with isolating age, period and cohort effects using cross-sectional, longitudinal and sequential research designs.
3 hrs. (lects. and practice); one term
Prerequisite: Registration in Level III or IV of any Gerontology programme, completion of Gerontology 2A03, and at least 3 units of statistics or research methods from the following: Anthropology 2Z03, 3P03; Economics 2B03, 3O06; Geography 2L03; Psychology 2G03, 2R06; PoliticalScience 3G03; Sociology 2Y03, 2Z03, 3H06; Statistics 2R06.

GERONTOL 3D03 PSYCHOLOGICAL ASPECTS OF AGING
An examination of psychological aspects of aging: sensation, perception, attention, memory, intelligence, communication, personality, attitudes and mental health.
3 hrs. (lects. and discussion); one term
Prerequisite: Open to students in Level III or IV of any Gerontology programme who have completed Gerontology 1A06 or Social Science 2G06, and Psychology 1A06; or permission of the instructor.
Same as Psychology 3DD3.
Students in a Psychology Programme (except those in Gerontology & Psychology) must register for this course as Psychology 3DD3.

GERONTOL 3E03 INDEPENDENT STUDY IN GERONTOLOGY
The student will select a topic in gerontology for an in depth investigation under the supervision of a faculty member and write a paper on findings.
Prerequisite: Registration in Level III or IV of any Gerontology programme and permission of course coordinator. The study will normally extend over two terms.
Gerontology 3E03 may be repeated, if on a different topic, to a total of six units.

GERONTOL 3Q03 ANTHROPOLOGICAL APPROACHES TO THE STUDY OF AGING
An examination of the contribution of anthropology to the study of aging with an emphasis on cross-cultural comparisons, and including an assessment of the anthropological literature relating to the biological basis of aging in modern and prehistoric populations.
3 hrs. (lects. and discussion); one term
Prerequisite: Anthropology 1A03 and 3 other units of Social/Cultural Anthropology, or registration in any programme in Gerontology; or permission of the instructor.
Same as Anthropology 3Q03.

GERONTOL 4A06 GERONTOLOGY THESIS
Students conduct research projects with individual faculty members. Students who write a thesis in the other subject of their combined programme, must arrange for six additional units of Gerontology or Gerontology Area course work.
Prerequisite: Registration in Level IV of an Honours Gerontology programme, and permission of course co-ordinator.

GERONTOL 4B03 COMMUNICATION AND COUNSELLING WITH OLDER ADULTS
This course introduces the student to issues in communication and counselling with older adults. Appropriate theories will be explored through lectures, discussions and practice.
One term
Prerequisite: Gerontology 3B03, registration in Level III or IV of any Gerontology programme, and permission of the instructor.
Enrolment is limited.

GERONTOL 4C03 SPECIAL TOPICS IN GERONTOLOGY
Topics may vary from year to year. Students should consult the Committee of Instruction prior to registration, concerning topics to be examined.
Prerequisite: Registration in Level IV of an Honours Gerontology programme: or permission of the instructor.

GERONTOL 4I03 PHYSICAL ACTIVITY, LEISURE AND AGING
An Examination of the concepts and theories of physical activity and leisure with respect to aging and vitality in later life.
3 hrs. (lects.); one term
Prerequisite: Registration in Level III or IV of any Gerontology programme or permission of the instructor.
Same as Physical Education 4I03.

GERONTOL 4S03 SOCIAL POLICY AND THE AGING POPULATION
An examination of social problems arising from the aging of the population, and an analysis of the existing social policies designed to deal with the problems.
Prerequisite: Registration in Level IV of any Gerontology programme and permission of the instructor.

OTHER DESIGNATED GERONTOLOGY AREA COURSES
Students should check the prerequisites for these courses in the *Course Listings by Department* section of the Calendar.

Anthropology 3Q03	Anthropological Approaches to the Study of Aging
Health Sciences 3B04	Science, Health and Society
Health Sciences 4C03	Special Topics I
Health Sciences 4D03	Special Topics II
History 3EE3	History of Medicine in Canada
Philosophy 3C03	Advanced Bioethics
Religious Studies 2A06	Death and Dying in Human Experience
Religious Studies 2WW3	Health, Healing and Religion
Social Work 3C03	Social Aspects of Health and Disease
Sociology 3G03	Sociology of Health Care
Sociology 3HH3	Sociology of Health
Sociology 3X03	Sociology of Aging

Other courses may qualify as Gerontology Area courses. Students wishing to designate a course not on the list as an Area course must consult the Chairman of the Committee of Instruction, *prior* to registration.

Greek

(See *Classics, Greek*)

Health Sciences

Faculty Note:
Health Sciences courses are *normally* available only to students registered in following three programmes:

‡ Nursing (A and B Stream) courses.
† B.H.Sc. Pre-Programme Phase courses.
†† B.H.Sc. Programme courses.

HTH SCI 1A06 HUMAN BIOCHEMISTRY ‡
The biochemistry and nutrition of the human body in health and disease.

Term I's major topic is production of energy from glucose and fat. Obesity, diabetes, heart disease, running and starvation are used as examples to illustrate the metabolism of energy production. Vitamins and minerals related to glucose and fat metabolism are also discussed. Term II covers electrolyte balance, body pH, proteins, enzymes, protein malnourishment and nucleic acids. The metabolic processes are discussed against a backdrop of metabolic illness, drug metabolism and cancer. A final section deals with nutritional patterns for each stage of life, male and female.
3 lects.; 1 tut.; two terms
Prerequisite: Health Sciences 1B07; Registration in Level I of the B.Sc.N. (A) Stream programme, or Level III of the B.Sc.N. (B) Stream programme; or permission of the instructor.

HTH SCI 1B07 HUMAN BIOLOGICAL SCIENCE I ‡
Term I is an overview of human structure and function, including the metabolic and synthetic processes of cells and the role of chemical mediators on cell function; basic tissues and their developmental origins; the organization of the body; and the structure and function of the musculo-skeletal system.

Term II examines homeostasis. Structural and functional aspects of the cardiovascular, respiratory, renal and digestive systems are integrated around the major themes of haemodynamics, fluid compartments, metabolism and nutrition.
2 or 3 hr. lect./week, 1 lab. (3 hrs.) alternating with 1 tut. (2 hrs.) each week; two terms
Prerequisite: Health Sciences 1A06; Registration in Level I of the B.Sc.N. (A) Stream programme, or Level III of the B.Sc.N. (B) Stream programme.

HTH SCI 2B08 HUMAN BIOLOGICAL SCIENCE II ‡
The term begins with a study of reproductive anatomy and physiology, with particular emphasis on intrinsic control mechanisms and extrinsic methods of regulation of reproduction. Selected aspects of human growth and aging are presented through the remainder of the course in a tutorial setting.

The second half of the term focuses on a study of the central and peripheral nervous system, including the special senses and neuroendocrine relationships.

Medical microbiology and principles of pathology are considered in the latter half of the term, including structure and function of infectious agents, control measures and host defenses. Introductory skills in neurological assessment and drug actions on the nervous system are also considered.

The latter half of the second term is devoted to an examination of pharmacological principles.
3 hr. lect., alternating with 1 hr. lect. and 2 hr. tut./week, plus 3 hr. lab., alternating with 2 hr. tut./week; two terms
Prerequisite: Health Sciences 1A06 and 1B07, and registration in Level II of the B.Sc.N. (A) Stream programme, or the Level IV of the B.Sc.N. (B) Stream programme.

HTH SCI 3A04 CRITICAL APPRAISAL OF RESEARCH LITERATURE ‡ †
Introduction to the principles of clinical research and statistical inference with particular emphasis on critical assessment of evidence as presented in the health sciences literature related to the care of patients. A problem based approach will be taken.
3 hrs. (lects./problem-based tut.) and 2 hrs. (guided self-study); one term
Prerequisite: Registration in Level III of the B.Sc.N. (A) or (B) Stream programme, or registration in the B.H.Sc. Pre-programme Phase; or permission of instructor.

HTH SCI 3B04 HEALTH, SCIENCE AND SOCIETY ‡
This course is concerned with the biological environment, behavioural, social and economic factors that determine health needs of the population. There are three major components of the course: measuring health status, the determinants of health, and the provision of health care services.
3 hrs. (lect./problem-based tuts.), and 2 hrs. (guided self-study); one term.
Prerequisite: Registration in Level III of the B.Sc.N. (A) Stream programme, or Level IV of the B.Sc.N. (B) Stream programme; or permission of instructor.
Same as Health Sciences 4B04.

HTH SCI 3C03 SELECTED TOPICS IN HEALTH PROFESSIONAL EDUCATION †
This course will introduce the student to principles of adult learning utilized in health sciences with a focus on their application to adult education. Specific concepts include problem-based education, clinical problem-solving, self-directed learning, and small-group process.
2 hr. tut., 4 hrs. self-study biweekly; one term
Prerequisite: Registration in the B.H.Sc. Pre-programme Phase; or permission of the instructor.

HTH SCI 4A03 THEORETICAL BASIS OF PRACTICE OCCUPATIONAL THERAPY/PHYSIOTHERAPY ††
This course examines where the professions of occupational therapy and physiotherapy stand in their past, present and future development, and evaluation of theoretical bases and clinical models. Using a multidisciplinary approach, emphasis is placed on the ability to analyze and formulate models that clarify the roles and functions of both professions.
3 hrs. (lects., tuts.); one term
Prerequisite: Registration in the B.H.Sc. programme; or permission of the instructor.

HTH SCI 4B04 HEALTH, SCIENCE AND SOCIETY ††
This course is concerned with the biological, environmental, behavioural, social, and economic factors that determine the health of a given population and the role of health care services in meeting the health needs of the population. There are three major components to the course: measuring health status, the determinants of health, and the provision of health care services.
3 hrs. (lects./problem-based tuts.), and 2 hrs. (guided self-study); one term
Prerequisite: Registration in the B.H.Sc. Programme; or permission of the instructor.
Same as Health Sciences 3B04.

HTH SCI 4C03 SPECIAL TOPICS I ††
The course focuses on an examination of selected scientific concepts utilized in one specific area of clinical practice. Emphasis will be placed on the integration of concepts drawn from the biological, psychological, sociological, and measurement sciences for the analysis of health care problems.

The areas of clinical study are described below. Not all clinical study areas may be available each year. For further information contact the Programme Office.
3 hrs. (tut.); one term
Prerequisite: Registration in the B.H.Sc. Programme; or permission of the instructor.

HTH SCI 4D03 SPECIAL TOPICS II ††
This course is intended to give the student an opportunity to study in greater depth the chosen area of study of *Health Sciences 4C03*, in consultation with a faculty member. This study may take the form of a paper, presentation or project. The independent study is based on a negotiated learning contract with the instructor.
6 hrs. (independent study); one term
Prerequisite: Registration or credit, in Health Sciences 4C03.

HTH SCI 4L04 PRINCIPLES AND METHODS OF RESEARCH ‡

Advanced critical analysis of nursing and related literature. Principles of research methodology and statistics are used to examine systematically the literature in relation to selected topics. Students participate in an ongoing research study.
2 hrs. (lects.,problem-based tut.) one term, and 4 hrs. (guided self-study) second term; two terms
Prerequisite: Health Sciences 3A04 and registration in Level IV of the B.Sc.N. (A) or (B) Stream programme.

AREAS OF CLINICAL STUDY FOR HTH SCI 4C03

Not all clinical study areas may be available each year. For further information contact the Programme Office.

Health Care and the Elderly: This course is designed to study the biological, psychological and sociological aspects of aging. It will include study of the aging process, the epidemiology of aging and of the disease processes particularly prevelant in elderly persons, especially those affecting ability to live independently. Study of therapeutic measures used in their treatment will also be undertaken. Community resources available to facilitate independence, and those available in institutions will also be studied which aim to improve function and quality of life.

Neurosciences: This course focuses on selected therapeutic approaches commonly used by occupational and physical therapy in the treatment of patients with neurological disorders. Neurodevelopmental therapy, sensory integration, behavioural medicine, motor skill aquisition and cognitive restructuring are studied from the context of their scientific basis, as well as their principles and techniques of practice.

Occupational Health: The course will be based on the role of the occupational/ physiotherapist in occupational health. It will specifically look at:

a. prevention of illness/accident;
b. management of illness/accident;
c. return to work following illness/accident.

Psychosocial Rehabilitation: This course provides the student with a framework of observation/assessment of psychosocial issues in health care. Theoretical concepts from the clinical behavioural sciences' studies areas of individual, group, family, community, and the organization are presented and discussed by expert tutors. Psychosocial issues in clinical practice with physical and psychiatric health care problems are integrated, using an individual case study from the student's area of practice/interest.

Disability and Rehabilitation Issues: The purpose of this course is to critically explore selected factors that influence the rehabilitation of a disabled individual. Through investigation of the literature, and the use of identified resource personnel, students consider the biological, behavioural, social, environmental and economic factors that interact in the rehabilitation process. A problem based learning format allows the student to analyse the impact of these elements on the provision of rehabilitation services. Small group discussions allow students to examine their attitudes about disability, and explore mental barriers to the integration of disabled persons into Canadian society. Small mixed-disciplinary group discussions are also used to promote the student's skills in facilitating group function with a view to applying these principles in a multidisciplinary rehabilitation team. During the course students have the opportunity to investigate community resources and evaluate their ability to meet the needs of disabled individuals.

Hebrew

(See *Religious Studies, Hebrew*)

Hispanic Studies

Courses and programmes in *Hispanic Studies* are administered within the Department of Modern Languages of the Faculty of Humanities.

Faculty as of January 15, 1989

Associate Professors

John D. Browning/B.A., M.Phil. *(London)*, Ph.D. *(Essex)*
Pilar Martinez/Licenciatura, Chem. *(Madrid)*, M.A. *(Middlebury)*, Doct. En Fil. Y Letras *(Madrid)*
Fiorigio Minelli/B.A., M.A. *(Western)*, Ph.D. *(Brown)*

Assistant Professor

Maria del C. Cerezo/ B.A. *(Puerto Rico)*, M.A. *(McGill)*, Ph.D. *(Toronto)*

Department Note:

The completion of Hispanic Studies 1A06 or 2Z06, 2A03, 3A03 and 3AA3, with a weighted average of at least 10.0 (A –) by non-programme students will result in a transcript notation indicating that the student has acquired a good working knowledge of spoken and written Spanish.

Beginner's Language Course

HISPANIC ST 1Z06 BEGINNER'S INTENSIVE SPANISH

A course designed to cover the rudiments of the language in both written and oral forms. This course also provides preparation for more advanced work in Spanish.
5 hrs.; two terms
Prerequisite: Open, except to students with credit in Grade 12 or Grade 13 or OAC Spanish or equivalent.
Students with prior knowledge of the language as determined by a placement test may be required to take an appropriate alternative.

Intermediate and Advanced Language and Literature Courses

HISPANIC ST 1A06 INTERMEDIATE SPANISH

A course designed to further the student's command of the language in its oral and written forms. There will be some review of basic grammar, but emphasis will be upon composition, expansion of vocabulary, and the more advanced aspects of the language.
3 hrs.; two terms
Prerequisite: Grade 12 or Grade 13 or OAC Spanish; or permission of the Department. Not available to students with credit in or registered in Hispanic Studies 2Z06. A required course for those intending to enter *Alternative A* of the Combined Honours programme in Hispanic Studies.

Students with prior knowledge of the language as determined by a placement test may be required to take an appropriate alternative.

HISPANIC ST 2A03 LANGUAGE PRACTICE I

A course devoted to the expansion of vocabulary, the improvement of comprehension, and the achievement of greater confidence and versatility in the language by using different and creative forms of communication.
3 hrs.; one term
Prerequisite: Hispanic Studies or Spanish 1A06, or concurrent registration in Hispanic Studies 2Z06; or permission of the Department.

HISPANIC ST 2B03 INTRODUCTION TO THE CULTURE OF SPAIN

A course which surveys the development of Spanish art, literature, and politics from the earliest times.
3 lects.; one term
Prerequisite: Spanish or Hispanic Studies 1A06 or 1Z06; or permission of the Department.

HISPANIC ST 2C03 INTRODUCTION TO THE CULTURE OF SPANISH AMERICA

A survey of the development of Spanish America from Maya times to the present day.
3 lects.; one term
Prerequisite: Spanish or Hispanic Studies 1A06 or 1Z06; or permission of the Department.

HISPANIC ST 2E03 CRITICAL APPROACHES TO LITERATURE IN SPANISH

A course which acquaints the student with some of the critical techniques involved in the appreciation of literature in Spanish, and which provides practice in essay writing.
3 lects.; one term
Prerequisite: Hispanic Studies 2A03 or Spanish 2A04.

HISPANIC ST 2Z06 INTERMEDIATE SPANISH

A course designed to further the student's command of the language in its oral and written forms. There will be some review of basic grammar, but emphasis will be upon composition, expansion of vocabulary, and the more advanced aspects of the language.
3 hrs.; 2 terms
Prerequisite: Hispanic Studies 1Z06 or Spanish 1Z06. Not available to students with credit in or registered in Hispanic Studies 1A06 or Spanish 1A06. A required course for those intending to enter *Alternative B* of the Combined Honours programme in Hispanic Studies.

HISPANIC ST 3A03 SYNTAX

A course which provides opportunities to develop a deeper awareness of style through the study of syntax. Elements of syntax and translation will be included.
3 hrs.; one term
Prerequisite: Hispanic Studies 1A06 or 2Z06, or Spanish 1A06.

HISPANIC ST 3AA3 LANGUAGE PRACTICE II

A course with two main ojectives: to teach the rudiments of translation into and out of Spanish, and to train the student to read a text in Spanish, to assimilate it, to isolate the essential ideas and to reproduce them concisely in his or her own words.
3 hrs.; one term
Prerequisite: Hispanic Studies 1A06 or 2Z06.

HISPANIC ST 4AA3 ADVANCED LANGUAGE PRACTICE

A continuation of Hispanic Studies 3AA3. The emphasis is on the précis work begun in 3AA3, and on translation into and out of Spanish. A variety of texts of increasing difficulty will be used for both purposes.
3 hrs.; one term
Prerequisite: Hispanic Studies 3AA3, or Spanish 3A04.

HISPANIC ST 4L03 SPANISH DRAMA OF THE GOLDEN AGE

A study of plays by major Spanish playwrights of the period 1550-1680, including works by Cervantes, Lope, Tirso, Calderón, in English translation.
3 lects.; one term
Prerequisite: Hispanic Studies 2E03, or Spanish 2E06.
Not offered in 1989-90. Offered in alternate years.
Same as Drama 4DD3.

HISPANIC ST 4LL3 SPANISH AMERICAN NARRATIVE OF THE *BOOM* GENERATION

A study of the novel and of the short story of the *Boom* generation: their themes and formal aspects.
3 lects.; one term
Prerequisite: Hispanic Studies 2E03, or Spanish 2E06.
Offered in alternate years.

HISPANIC ST 4M03 THE SPANISH NOVEL OF THE 20TH CENTURY

Representative Spanish novels of the post-civil war period.
3 lects.; one term
Prerequisite: Hispanic Studies 2E03, or Spanish 2E06.
Not offered in 1989-90. Offered in alternate years.

HISPANIC ST 4MM3 CERVANTES AND HIS TIMES

An analytical study of the *Quijote* and of some of Cervantes' other works within the context of the intellectual history of the 16th century.
3 lects.; one term
Prerequisite: Hispanic Studies 2E03, or Spanish 2E06. Not available to students with credit for this topic taken as Spanish 4C03.
Offered in alternate years.

HISPANIC ST 4NN3 THE SPANISH NOVEL OF THE 19TH CENTURY

A study of the novel of the second half of the 19th century in the context of the stylistic trends and intellectual history of the period.
3 lects.; one term
Prerequisite: Hispanic Studies 2E03, or Spanish 2E06. Not available to students with credit for this topic taken as Spanish 4I03.
Offered in alternate years.

HISPANIC ST 4P03 THE SPANISH AMERICAN NOVEL BEFORE 1950

A study of the development of the Spanish American novel up to the middle of the 20th century.
3 lects.; one term
Prerequisite: Hispanic Studies 2E03, or Spanish 2E06. Not available to studuents with credit in Spanish 4E03.
Not offered in 1989-90. Offered in alternate years.

HISPANIC ST 4PP3 MEDIEVAL SPANISH LITERATURE

A survey of the major themes in writings of the period 1100 to 1500. Early love poetry, the *Poema de Mio Cid*, the *Libro de buen amor*, the *Celestina* and the *Coplas* of Jorge Manrique will be among the works studied.
3 lects.; one term
Prerequisite: Hispanic Studies 2E03, or Spanish 2E06. Not available to students with credit for this topic taken as Spanish 4K03.
Offered in alternate years.

HISPANIC ST 4Q03 MODERN SPANISH POETRY

This course will cover Spanish poetry from the Romantic period to the present.
3 lects.; one term
Prerequisite: Hispanic Studies 2E03, or Spanish 2E06. Not available to students with credit in Hispanic 4N03 or for this topic taken as Spanish 4J03.
Not offered in 1989-90. Offered in alternate years.

HISPANIC ST 4QQ3 MODERN SPANISH AMERICAN POETRY

This course will cover Spanish-American poetry of the 20th century.
3 lects.; one term
Prerequisite: Hispanic Studies 2E03, or Spanish 2E06. Not available to students with credit in Hispanic 4N03 or for this topic taken as Spanish 4J03.
Not offered in 1989-90. Offered in alternate years.

HISPANIC ST 4SS3 THE SPANISH-AMERICAN SHORT STORY

A study of the evolution of the Spanish-American short story from Quiroga to García Márquez.
3 lects.; one term
Prerequisite: Hispanic Studies 2E03, or Spanish 2E06. Not open to students with credit for this topic taken as Spanish 4K03.
Not offered in 1989-90. Offered in alternate years.

HISPANIC ST 4T03 TOPICS IN HISPANIC LITERATURE

1989-90: The Spanish-American essay.
3 lects.; one term
Prerequisite: Hispanic Studies 2E03, or Spanish 2E06.
Hispanic Studies 4T03 may be repeated, if on a different topic, to a total of 6 units.

History

Faculty as of January 15, 1989

John C. Weaver/*Chairman*

Professor Emeritus

Charles M. Johnston/B.A. *(McMaster)*, M.A., Ph.D. *(Pennsylvania)*

Professors

Ezio Cappadocia/B.A., M.A. *(Toronto)*, Ph.D. *(Chicago)*
Alan Cassels/M.A. *(Oxford)*, Ph.D. *(Michigan)*, F.R.H.S.
Paul S. Fritz/B.A. *(Queen's)*, M.A. *(Wisconsin)*, Ph.D. *(Cambridge)*, F.R.H.S.
David P. Gagan/B.A., M.A. *(Western)*, Ph.D. *(Duke)*
Daniel J. Geagan/A.B. *(Boston)*, Ph.D. *(Johns Hopkins)*
Harvey A. Levenstein/B.A. *(Toronto)*, M.S., Ph.D. *(Wisconsin)*
Richard A. Rempel/B.A. *(Saskatchewan)*, B.A., M.A., D. Phil. *(Oxford)*
David J. Russo/B.A. *(Massachusetts)*, M.A. Ph.D. *(Yale)*
Richard J.A. Talbert/B.A., M.A., Ph.D. *(Cambridge)*
John H. Trueman/B.A., M.A. *(Toronto)*, Ph.D. *(Cornell)*
John C. Weaver/B.A. *(Queen's)*, M.A., Ph.D. *(Duke)*

Associate Professors

James D. Alsop/B.A. *(Winnipeg)*, M.A. *(Western)*, Ph.D. *(Cambridge)*, F.R.H.S.
David P. Barrett/B.A., M.A., M.Phil. *(Toronto)*, Ph.D. *(London)*
Edmond M. Beame/B.A. *(Cornell)*, Ph.D. *(Illinois)*
John P. Campbell/M.A. *(Glasgow)*, A.M., Ph.D. *(Yale)*
George J. Grinnell/B.S. *(Columbia)*, M.A., Ph.D. *(California)*
Robert H. Johnston/B.A. *(Toronto)*, M.A., Ph.D. *(Yale)*
Bernice M. Kaczynski/B.A. *(Pittsburgh)*, M.Phil., Ph.D. *(Yale)*
Harry E. Turner/B.A. *(McMaster)*, M.A. *(Toronto)*
Thomas E. Willey/B.A. *(Butler)*, M.A., Ph.D. *(Yale)*

Assistant Professors

Michael Gauvreau/B.A. *(Laurentian)*, M.A., Ph.D. *(Toronto)*
Daniel Ritschel/B.A., M.A. *(McGill)*, D. Phil. *(Oxford)*
Wayne Westergard-Thorpe/B.A. *(Washington)*, B.A. *(Portland State)*, M.A. *(Colorado)*, Ph.D. *(British Columbia)*

Sessional Assistant Professor (P.T.)

David R. Schweitzer/B.A., M.A. *(Guelph)*, Ph.D. *(London)*

Sessional Lecturer

Douglas M. Peers/B.A., M.A. *(Calgary)*

Associate Members

Peter J. George/M.A., Ph.D. *(Toronto)* (Economics)
George Paul/M.A. *(Oxford)*, Ph.D. *(London)* (Classics)
Charles G. Roland/B.Sc. (Med.), M.D. *(Manitoba)* (Family Medicine)

Department Notes:

1. The Department of History offers three Level I courses, each of which is designed to introduce the student to the study of History at the university level through the examination of an important aspect of the development of western civilization. Students will be admitted to B.A. or Honours programmes in History from any one of the three courses. Students may take only one of these courses.
2. Students in B.A. History may take a maximum of 12 units in any one field of Ancient, Asian, Canadian, British, and the Americas (excluding Canada), and 18 units of European History, including Level I, but exclusive of electives. Students in any Honours programme in History may take a maximum of 24 units in any one field of Ancient, Asian, Canadian, British, and the Americas (excluding Canada), and 30 units of European History, including Level I, but exclusive of electives.
3. In selecting courses students in B.A. and Honours History and in a Combined Honours programme including History must ensure that they take at least six units in each of three fields of History. For this purpose the Department has established the following six fields: European, Ancient, Asian, Canadian, British and the Americas (excluding Canada). This requirement must be satisfied by the end of Level III. All Level I, II, and III History courses may be used towards this requirement.

4. Enrolment in any Level IV History course will be limited to twelve students. Students must be registered in an Honours History programme or have a History C.A.A. of 7.0 in another programme to enrol in any Level IV History course. Preference will be given in order to students in the following categories: Level IV Honours History; Level IV Combined Honours in History and another subject; Continuing students taking a full course load; Level III Honours History; Level III Combined Honours in History and another subject; Level III B.A. in History; others.
5. In fulfilling the 12 units of Humanities requirement for the Honours and B.A. History degrees, students may not select history courses crosslisted in other departments. For example, Classical Civilization 2G06 cannot be used to meet the Humanities requirement, as it is also offered as History 2L06.
6. Students interested in Ancient History are advised to examine the courses in Classical Civilization offered by the Department of Classics.

Level I Courses

HISTORY 1C06 THE MODERN WORLD: THE ERA OF EUROPEAN PRIMACY

A study of the background and development, from the French Revolutionary Era to the present, of the principal political, intellectual, and economic factors that have shaped the 20th-century world.
3 hrs. (lects. and discussion groups); two terms
Prerequisite: Open. Students may take only one Level I History course.

HISTORY 1D06 THE CIVILIZATION OF THE WEST

A study of the principal themes and issues in European history from the Fall of the Roman Empire to the twentieth century.
3 hrs. (lects. and discussion groups); two terms
Prerequisite: Open. Histoy 1D06 is recommended for those students who anticipate entering a programme in History. Students may take only one Level I History course.

HISTORY 1L06 ANCIENT STATES AND EMPIRES

Comparative analysis of the earliest states and empires of Western Asia and the Mediterranean with references to other ancient empires. Focus on the impulse to domination and on the societies, structures and ideologies which legitimised and stabilised the empires.
3 hrs. (lects. and discussion groups); two terms
Prerequisite: Open. Students may take only one Level I History course.
Not offered in 1989-90.

Level II Courses

HISTORY 2A06 EARLY MODERN EUROPE 1400-1715

A study of the transition from late medieval to early modern civilization, with emphasis upon the breakup of feudal society and the consequent changes in the character of Europe.
3 hrs. (lects. and discussion groups); two terms
Prerequisite: Open to students in Level II and above.

HISTORY 2B06 CHINA: FROM THE OPIUM WAR TO THE PRESENT

The history of China in the 19th and 20th centuries. The emphasis will be on internal developments, from the disintegration of the imperial system through the rise of the Communist Party to the building of the People's Republic of today.
3 lects.; two terms
Prerequisite: Open to students in Level II and above.

HISTORY 2H06 UNITED STATES HISTORY

The history of the United States from the Colonial Era to the Second World War.
3 hrs. (lects. and discussion groups); two terms
Prerequisite: Open to students in Level II and above.

HISTORY 2I06 EUROPE IN THE MIDDLE AGES

A survey of European History from A.D. 400-1400. Particular attention will be given to the attempts at political and social organization which led to the 'birth of Europe'.
3 hrs. (lects. and discussion); two terms
Prerequisite: Open to students in Level II and above.

HISTORY 2J06 THE HISTORY OF CANADA

A study of the major social and political forces that have contributed to the development of modern Canada.
3 lects.; two terms
Prerequisite: Open to students in Level II and above.

HISTORY 2K06 THE HISTORY OF SCIENCE

Historical explorations into such issues as ecology vs. industrial progress, nuclear energy, genetic engineering and sociobiology, the creationist/evolutionist debate, Galileo and the Church, Renaissance art and science, and the origins of Western science.
3 hrs. (lects. and discussion groups); two terms
Prerequisite: Open to students in Level II and above.
Not offered in 1989-90.

HISTORY 2L06 THE HISTORY OF GREECE AND ROME

Greece from the rise of the city-states to Alexander; Rome from the Middle Republic through the early Empire. Attention will be given to the political, military and social developments in the light of both literary and archaeological evidence. (No Greek or Latin required).
3 hrs. (lects. and discussion groups); two terms
Prerequisite: Open to students in Level II and above.
Same as Classical Civilization 2G06.

HISTORY 2M06 EUROPEAN SOCIETY FROM ABSOLUTISM TO DEMOCRACY

An analysis of the main political, social, and cultural forces shaping European Society from 1740 to 1918. The course will focus on the formation of modern political institutions, social classes and ideologies.
3 hrs. (lects. and discussion groups); two terms
Prerequisite: Open to students in Level II and above.

HISTORY 2N06 BRITISH HISTORY 1500 TO THE PRESENT

Emphasis will be placed on the main political, religious, economic and social developments.
3 hrs. (lects. and discussion groups); two terms
Prerequisite: Open to students in Level II and above.

Level III Courses

HISTORY 3A03 TOPICS IN MODERN ITALIAN HISTORY, 1815 TO THE PRESENT

The Risorgimento, the Roman question, Fascism and contemporary issues of Catholicism and Communism.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Not offered in 1989-90.

HISTORY 3B03 MODERN JAPAN

A survey of nineteenth and twentieth century Japan, with emphasis on political developments, social change, and Japan's relations with East Asia.
3 lects.; one term
Prerequisite: Open to students in Level II and above.

HISTORY 3BB3 THE TOWN IN UNITED STATES HISTORY

A study of the political, economic, social, cultural and intellectual aspects of town life, as well as an examination of the relationship of the town to American society as a whole.
3 lects.; one term
Prerequisite: Six units of History.

HISTORY 3D03 THE FRENCH REVOLUTION

A study of the origins, nature and impact of the French Revolution, and of the legacy of the Revolutionary-Napoleonic period.
3 hrs. (lects. and discussion); one term
Prerequisites: One of History 1D06, 2A06, 2M06; or permission of the Department.
Offered in alternate years.

HISTORY 3DD3 IMPERIAL CHINA: SELECTED TOPICS IN THE HISTORY OF CHINA FROM 221 B.C. TO THE 18TH CENTURY

Government, social structure, internal politics and China's relations with the outside world during the imperial age.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Not offered in 1989-90.

HISTORY 3E06 SELECTED TOPICS IN THE RECENT HISTORY OF THE UNITED STATES

American society, politics, and foreign relations from World War I to the present, with considerable emphasis on social history (including the history of women, minorities, labour, and radicalism), as well as the United States' relations with the Communist and Third Worlds.
3 hrs. (lects. and discussion groups); two terms
Prerequisite: History 2H06; or permission of the Department.

HISTORY 3EE3 HISTORY OF MEDICINE IN CANADA

An examination of the development of medical and health services in Canadian history. Emphasis will be on the interaction between society and medicine, rather than the technical aspects of medicine.
3 hrs. (lects. and discussion); one term
Prerequisite: Open to students in Level II and above.
Not offered in 1989-90.

HISTORY 3F03 MEDIEVAL SOCIETY

An examination of rural, aristocratic, urban and monastic communities of the Middle Ages. Attention will be given to patterns of social organization as well as to such particular themes as marriage, family and death.
3 hrs. (lects. and discussion group); one term
Perequisite: One of History 1A06, 1D06, 2I06; or permission of the Department.

HISTORY 3FF3 MODERN POLAND 1863-1970

An examination of the development of Poland since the failure of the crucial rebellion of 1863-4. Emphasis will be on the struggle for national independence and on social and industrial modernization.
3 hrs. (lects. and discussion); one term

Prerequisite: History 1C06; or permission of the instructor.
Offered in alternate years.
Same as Political Science 3T03.
Not offered in 1989-90.

HISTORY 3HH3 THE INTERNATIONAL RELATIONS OF THE EUROPEAN POWERS, 1815-1914
An examination of the post-Napoleonic settlement of 1815; its breakdown and the triumph of the national unification movements; the causes of World War I.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Alternates with History 3I03.
Not offered in 1989-90.

HISTORY 3H06 THE HISTORY OF MODERN RUSSIA
A survey of the history of Russia with major emphasis on the 19th and 20th centuries.
3 lects.; two terms
Prerequisite: Registration in any programme in History; or permission of the Department.

HISTORY 3I03 THE INTERNATIONAL RELATIONS OF THE EUROPEAN POWERS, 1914-1945
An examination of the "German problem"; the post World War I settlement and its failure to prevent another world war; the shaping of present-day Europe by World War II.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Alternates with History 3HH3.

HISTORY 3I16 THE HISTORY OF WARFARE, 1865-1945
A survey of the development of military, naval, and air doctrine and technology before the start of the nuclear age, with particular emphasis on the relationship between prewar theory and wartime experience during the two World Wars.
3 lects.; two terms
Prerequisite: Open to students in Level II and above.

HISTORY 3J06 GERMANY AND AUSTRIA FROM THE HABSBURGS TO HITLER
An analysis of major political, social, and cultural developments in the German states and Austria from the Reformation to 1955.
3 hrs. (lects. and discussion groups); two terms
Prerequisite: Open to students in Level II and above.

HISTORY 3JJ3 CRIME, CRIMINAL JUSTICE AND PUNISHMENT IN MODERN HISTORY
A study of the changing face of the institutions of criminal justice, and of criminal behaviour, as revealed in statistical and conventional historical works. The focus will be on North America, Great Britain and France.
3 lects.; one term
Prerequisite: Open to students in Level II and above, with a minimum of 6 units of History.
Offered in alternate years.

HISTORY 3KK6 CANADA IN THE TWENTIETH CENTURY
A survey of the major events and themes in Canadian political and social history from the start of the Laurier government to the present.
3 hrs. (lects. and discussion groups); two terms
Prerequisite: History 2J06; or permission of the Department.

HISTORY 3LL3 THE HELLENISTIC AGE
The successors of Alexander, the world of the monarchies and their absorption into the Roman Empire. Political, cultural and social achievements in the light of modern historical research will be emphasized.
3 hrs. (lects. and discussion groups); one term
Prerequisite: Open to students in Level II and above.
Offered in alternate years.
Same as Classical Civilization 3LL3.

HISTORY 3MM3 THE ROMAN EMPIRE
Rome, Italy and the provinces from the creation of an autocracy by Augustus until the end of the 2nd century A.D.: developments in government, society, defence and economy; the Romanization of the provinces. Archaeological evidence and new approaches to problems will be considered.
3 hrs. (lects. and discussion groups); one term
Prerequisite: History 1L06 or 2L06, or 6 units of Classical Civilization; or permission of the Department.
Offered in alternate years.
Same as Classical Civilization 3MM3.
Not offered in 1989-90.

HISTORY 3N03 THE HISTORY OF THE CANADIAN WORKING CLASS
An examination of social, political and economic issues shaping the development of the Canadian working class. This includes investigation of the ideological divisions, ethnic relations, and gender roles within the working class and within the labour movement.
3 lects.; one term
Prerequisite: History 2J06, or registration in a Labour Studies programme; or permission of the Department.

HISTORY 3NN3 THE NEWTONIAN REVOLUTION
A study of the relationship between science and liberalism since the time of Newton.
3 hrs. (lects. and discussion groups); one term
Prerequisite: Open to students in Level II and above.
Alternates with History 3Q03.
Not offered in 1989-90.

HISTORY 3O03 THE CITY IN NORTH ATLANTIC DEVELOPMENT
This course examines the material culture of the North American city, including town planning, housing, commercial and industrial architecture and transportation with select comparison made between the European and North American city.
3 lects.; one term
Prerequisite: History 2J06 or 2H06; or permission of the Department. Not available to students with credit in History 3O06.
Offered in alternate years.
Not offered in 1989-90.

HISTORY 3P03 RELIGION AND SOCIETY IN CANADA
This course will examine the origin, nature and development of the major Canadian religious denominations from the 17th to the mid-20th Century.
3 hrs. (lects. and discussion groups); one term
Prerequisite: Open to students in Level II and above.
Offered in alternate years.
Not offered in 1989-90.

HISTORY 3PP3 CHANGE AND CONTINUITY: THEMES IN VICTORIAN BRITAIN
An examination of the main political, social and cultural developments with particular reference to the Liberal and Radical movements and the persistence of aristocratic power.
3 hrs. (lects. and discussion groups); one term
Prerequisite: Open to students in Level II and above. Not available to students with credit in History 3Y06.
Not offered in 1989-90.

HISTORY 3Q03 THE DARWINIAN REVOLUTION
The evolutionist/creationist debate since the time of Darwin as seen from social, political, religious and scientific perspectives.
3 hrs. (lects. and discussion groups); one term
Prerequisite: Open to students in Level II and above.
Alternates with History 3NN3.
Not offered in 1989-90.

HISTORY 3QQ3 WAR AND SOCIETY IN EARLY MODERN ENGLAND, 1485-1713
A thematic study of the nature of English warfare and its relationship to society during the period in which England developed as a major military and naval power.
3 hrs. (lects. and discussion groups); one term
Prerequisite: Open to students in Level II and above.
Not offered in 1989-90.

HISTORY 3R03 RELIGION AND POLITICS IN THE AGE OF THE REFORMATION
An examination of both the Protestant and Catholic movements of the 16th century with particular attention to their political and social implications.
3 lects.; one term
Prerequisite: Open to students in Level II and above.

HISTORY 3RR3 WAR AND SOCIETY IN 20TH CENTURY BRITAIN
A comparison of the impact of World War I on Britain with that of World War II.
3 hrs. (lects. and discussion groups); one term
Prerequisite: Open to students in Level II and above.

HISTORY 3S03 THE CRAFT OF THE HISTORIAN
An exploration of some basic issues involved in the study and writing of history. Themes will include topics such as the varieties of history, theories of causation, the uses of the past, and the place of history in popular culture.
3 lects.; one term
Prerequisite: Registration in any programme in History; or permission of the Department.
Not offered in 1989-90.

HISTORY 3SS3 ASPECTS OF THE CULTURAL HISTORY OF ENGLAND, 1500-1688
An introduction to courtly, urban, and rural culture from pre-Reformation humanism through to the Restoration era, with emphasis upon social, political and religious influences.
3 hrs. (lects. and discussion groups); one term
Prerequisite: Open to students in Level II and above.

HISTORY 3T03 THE VICTORIAN EMPIRE
A study of the nature, development, and diversity of British expansion in the nineteenth century.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Offered in alternate years.
Not offered in 1989-90.

HISTORY 3TT3 MATERIAL LIFE AND MATERIAL CULTURE IN ENGLAND, 1500-1800

Among topics covered will be: food and drink, clothing, costume and fashion, lodging, health and medicine, architecture of towns and cities, technology, capitalism and the emergence of a consumer society.

3 hrs. (lects. and discussion groups); one term

Prerequisite: Open to students in Level II and above.

HISTORY 3U03 ASPECTS OF FRENCH CANADIAN HISTORY

Emphasis will be placed on Quebec from the 18th to mid-20th Century.

3 hrs. (lects. and discussion groups); one term

Prerequisite: History 2J06; or permission of the Department. Not available to students with credit in History 3Z06.

Offered in alternate years.

HISTORY 3UU3 GREEK SOCIETY IN THE AGE OF PERICLES

A description and analysis of selected aspects of the social life of Athens in the second half of the 5th century B.C., based upon contemporary literature, documents and artifacts. Lectures will deal in greater depth with topics introduced in Classical Civilization 2U03, as well as others peculiar to Periclean Athens: work and leisure, education, religion, marriage and family life, the roles of women, war and peace, social structure, and social mobility.

3 lects.; one term

Prerequisite: History 1L06 or 2L06, or six units of Classical Civilization courses, including 2U03; or Classical Civilization 2G06; or permission of the Department. Not available to students with credit in Classical Civilization 3M03.

Alternates with History 3VV3.

Same as Classical Civilization 3UU3.

HISTORY 3V06 THE PEOPLE OF ONTARIO, 1790-1940: AN INTRODUCTION TO REGIONAL SOCIAL HISTORY

A survey of the development of society in Ontario stressing the interplay of social, economic and demographic factors in the transition from an agrarian to an urban industrial society.

3 hrs. (lects. and discussion groups); two terms

Prerequisite: Open to students in Level II and above.

Not offered in 1989-90.

HISTORY 3VV3 ROMAN SOCIETY IN THE AGE OF AUGUSTUS

A description and analysis of selected aspects of social life of Rome at the end of the 1st century B.C. based upon contemporary literature, documents, and artifacts. Lectures will deal in greater depth with topics introduced in Classical Civilization 2V03, as well as others peculiar to Augustan Rome: work and leisure, education, religion, marriage and family life, the roles of women, war and peace, social structure, and social mobility.

3 lects.; one term

Prerequisite: History 1L06 or 2L06, or Classical Civilization 2V03 and 3 additional units of Classical Civilization; or Classical Civilization 2G06; or permission of the Department. Not available to students with credit in Classical Civilization 4N03.

Alternates with History 3UU3.

Same as Classical Civilization 3VV3.

Not offered in 1989-90.

HISTORY 3W03 THE SOCIALIST TRADITION IN MODERN EUROPE

An examination of major developments in socialist ideology in Modern Europe: early socialism, Marxism, anarchism, syndicalism, revisionism, Leninism; the conflict between libertarian socialism, communism and democratic socialism in the twentieth century.

3 hrs. (lects. and discussion); one term

Prerequisite: Open to students in Level II and above.

Offered in alternate years.

HISTORY 3WW3 TOPICS IN GREEK AND ROMAN SOCIETY

3 lects.; one term

Prerequisite: History 2L06, or six units of Classical Civilization including 2U03 or 2V03.

Offered in alternate years.

Same as Classical Civilization 3WW3.

History 3WW3 may be repeated, if on a different topic, to a total of 6 units.

Not offered in 1989-90.

HISTORY 3XX3 EARLY LATIN AMERICA

From the Amerindian cultures to 1823. The course will deal with the pre-Columbian civilizations, the Spanish conquest and its consequences until the wars for independence from Spain.

3 lects.; one term

Prerequisite: Open to students in Level II and above. Not available to students with credit in History 2C06.

Not offered in 1989-90.

HISTORY 3YY3 MODERN LATIN AMERICA SINCE 1820

Liberalism, nationalism, militarism and the various revolutions will be covered as well as the U.S. role in Latin America and the Caribbean.

3 lects.; one term

Prerequisite: Open to students in Level II and above. Not available to students with credit in History 2C06.

Not offered in 1989-90.

Level IV Courses

HISTORY 4A06 SPECIAL TOPICS IN BRITISH HISTORY (1688-1830)

Seminar (2 hrs.); two terms

Prerequisite: History 2N06 and registration in Level III or IV of any Honours programme in History; or permission of the Department.

Enrolment is limited.

HISTORY 4AA6 SPECIAL STUDIES IN THE HISTORY OF TUDOR AND STUART ENGLAND

Studies in the political, religious, intellectual and social life of Tudor and Stuart England.

Seminar (2 hrs.); two terms

Prerequisite: One of History 2N06, 3QQ3, 3SS3, or 3TT3, and registration in Level IV of any Honours programme in History with a History Cumulative Area Average of at least 9.0; or permission of the Department.

Enrolment is limited.

HISTORY 4B06 MODERN CANADA, 1896-1968: AN INTELLECTUAL AND CULTURAL HISTORY

An intensive study of the shaping of the twentieth-century outlook in English-speaking Canada. Topics will include the growth of the welfare state, ideologies (liberalism, conservatism, socialism, feminism), the cultural impact of the depression and the two world wars, and the role of religion in shaping the Canadian community.

Seminar (2 hrs.); two terms

Prerequisite: History 2J06 or 3KK6, and registration in Level III or IV or any Honours programme in History; or permission of the Department.

Enrolment is limited.

HISTORY 4C06 SPECIAL TOPICS IN BRITISH IMPERIAL HISTORY

The major emphasis of this course will be on the Victorian Empire.

Seminar (2 hrs.); two terms

Prerequisite: Registration in Level III or IV of any Honours programme in History; or permission of the Department.

Enrolment is limited.

Not offered in 1989-90.

HISTORY 4CC6 SPECIAL TOPICS IN THE SOCIAL AND CULTURAL HISTORY OF VICTORIAN CANADA

An examination of the social and cultural development of English Canada between 1837 and 1901.

Seminar (2 hrs.); two terms

Prerequisite: History 2J06 and registration in Level III or IV of any Honours programme in History; or permission of the Department.

Enrolment is limited.

Not offered in 1989-90.

HISTORY 4D06 SPECIAL TOPICS IN GREEK HISTORY

Investigations into Greek social history and its interpretation.

Seminar (2 hrs.); two terms

Prerequisite: Six units from History 1L06, 2L06, 3LL3, 3UU3, Classical Civilization 1A06, 2U03, and registration in Level III or IV of any Honours programme in History, Classics, or Classical Studies; or permission of the Department.

Same as Classical Civilization 4D06.

Enrolment is limited.

Not offered in 1989-90.

HISTORY 4E06 SPECIAL TOPICS IN THE HISTORY OF VICTORIAN BRITAIN

An examination of such themes as the two-party system, the Irish question, working-class life, religious and literary movements, evolving industrialism, imperialism and social reform.

Seminar (2 hrs.); two terms

Prerequisite: History 2N06 and registration in Level III or IV of any Honours programme in History; or permission of the Department.

Enrolment is limited.

HISTORY 4EE6 SOCIETY, SCIENCE AND THE MEDICAL PROFESSION IN 19TH- AND 20TH- CENTURY NORTH AMERICA

Selected topics in the history of professional medicine in Canada and the U.S.A., and its roots in western Europe: topics will include theory and practice (particularly the relationship between bacteria and disease), medical education, and the growth of institutions such as hospitals and departments of public health.

Seminar (2 hrs.); two terms

Prerequisite: One of History 2H06, 2J06, 3E06, 3EE3, 3KK6 and registration in Level III or IV of any Honours programme in History; or permission of the Department.

Enrolment is limited.

HISTORY 4F06 SPECIAL TOPICS IN THE AGE OF THE ENLIGHTENMENT

A detailed study of the intellectual revolution of the 17th and 18th centuries.

Seminar (2 hrs.); two terms

Prerequisite: History 2M06, and registration in Level III or IV of any Honours programme in History; or permission of the Department.

Enrolment is limited.

Not offered in 1989-90.

HISTORY 4G06 THE REVOLUTIONARY MOVEMENT IN MODERN CHINA
A history of 20th-century China with the focus on the political movements that have been the agents of change.
Seminar (2 hrs.); two terms
Prerequisite: History 2B06 and registration in Level III or IV of any Honours programme in History; or permission of the Department.
Enrolment is limited.

HISTORY 4H06 CANADIAN WOMEN'S HISTORY
An examination of historical changes in women's roles in Canadian society, particularly since Confederation. This includes investigation of family dynamics, women's work and women's political involvement.
Seminar (2 hrs.); two terms
Prerequisite: History 2J06 and registration in Level III or IV of any Honours programme in History; or permission of the Department.
Enrolment is limited.

HISTORY 4I06 SPECIAL TOPICS IN ROMAN HISTORY
The central theme will be development and change throughout the Roman Empire in the 3rd and 4th centuries A.D.
Seminar (2 hrs.); two terms
Prerequisite: Six units from History 2L06, 3MM3, 3VV3, Classical Civilization 2V03, and registration in Level III or IV of any Honours programme in History, Classics, or Classical Studies; or permission of the Department.
Same as Classical Civilization 4I06.
Enrolment is limited.
Not offered in 1989-90.

HISTORY 4J06 SPECIAL TOPICS IN THE HISTORY OF THE UNITED STATES IN THE 20TH CENTURY
Seminar (2 hrs.); two terms
Prerequisite: One of History 1K06, 2H06 or 3E06 and registration in Level III or IV of any Honours programme in History; or permission of the Department.
Enrolment is limited.

HISTORY 4K06 LABOUR AND THE LEFT IN MODERN EUROPE
An examination of the workers' movement in Europe since 1889. Topics include national variations in ideology and in the organization and practice of trade unions and political parties, as well as problems and strategies of international action.
Seminar (2 hrs.); two terms
Prerequisite: One of History 1C06, 2M06, 2N06, 3H06, 3J06, and registration in Level III or IV of any Honours programme in History; or permission of the Department.
Enrolment is limited.

HISTORY 4L06 SPECIAL TOPICS IN THE HISTORY OF THE UNITED STATES BEFORE 1865
Seminar (2 hrs.); two terms
Prerequisite: History 1K06 or 2H06 and registration in Level III or IV of any Honours programme in History; or permission of the Department.
Enrolment is limited.

HISTORY 4LL6 THEMES IN ANCIENT HISTORY
An examination of at least two selected themes in Ancient History, particularly the history of the Greco-Roman world, with emphasis on the use of source materials, primary and secondary, literary and non-literary.
Seminar (2 hrs.); two terms
Prerequisite: Six units from History 2L06, 3LL3, 3MM3, 3UU3, 3VV3, and registration in Level IV of any Honours programme in History, Classics or Classical Studies with a Cumulative Area Average of at least 9.0; or permission of the Department.
Same as Classical Civilization 4LL6.
Enrolment is limited.

HISTORY 4M06 SPECIAL TOPICS IN THE HISTORY OF THE RENAISSANCE AND THE REFORMATION
Seminar (2 hrs.); two terms
Prerequisite: One of History 1A06, 1D06, 2A06, 3R03, and registration in Level IV of any Honours programme in History with a History average of at least 9.0; or permission of the Department.
Enrolment is limited.

HISTORY 4N06 CANADIAN HISTORIOGRAPHY
A study of the ideas of the major historians of Canada.
Seminar (2 hrs.); two terms
Prerequisite: History 2J06 and registration in Level III or IV of any Honours programme in History; or permission of the Department.
Students may take only two of History 4N06, 4V06, 4W06 and 4Z06.
Enrolment is limited.

HISTORY 4O06 RUSSIA AND REVOLUTION
The impact of modernization upon the Soviet state and society.
Seminar (2 hrs.); two terms
Prerequisite: History 3H06 and registration in Level III or IV of any honours programme in History; or permission of the Department.
Enrolment is limited.

HISTORY 4P06 CONTEMPORARY EUROPE
Topics in the history of Europe during the 20th century.
Seminar (2 hrs.); two terms
Prerequisite: Six units from History 2M06, 3A03, 3FF3, 3J06, 3K03, and registration in Level III or IV of any honours programme in History; or permission of the Department.
Enrolment is limited.

HISTORY 4Q06 SPECIAL TOPICS IN THE HISTORY OF MEDIEVAL EUROPE AND BYZANTIUM
Topics will include the consequences of the Barbarian invasions, diplomatic communications between West and East, relations between the Roman and Orthodox Churches, the impact of the Crusades, and the significance of the fall of Constantinople.
Seminar (2 hrs.); two terms
Prerequisite: One of History 1A06, 1D06, 2I06 and registration in Level III or IV of any honours programme in History; or permission of the Department.
Enrolment is limited.

HISTORY 4S06 ENGLISH MEDIEVAL HISTORY
Selected themes in the history of Medieval England.
Seminar (2 hrs.); two terms
Prerequisite: One of History 1A06, 1D06, 2I06 and registration in Level III or IV of any honours programme in History; or permission of the Department.
Enrolment is limited.
Not offered in 1989-90.

HISTORY 4U06 INDEPENDENT RESEARCH
A reading and/or research programme under the supervision of at least two members of the Department. A major paper is required, as well as a formal oral examination.
Prerequisite: Open to students in Level IV of any Honours programme in History with a History Average of at least 10.0 and permission of the Department.
Enrolment is limited.

HISTORY 4W06 THE CANADIAN CITY
An examination of the Canadian city, including the study of traditional local histories, as well as urban social history. The course will examine change in urban society, questions of health, housing, economic activity, planning, and politics.
Seminar (2 hrs.); two terms
Prerequisite: History 2J06 and registration in Level III or IV of any Honours programme in History; or permission of the Department.
Students may take only two of History 4N06, 4V06, 4W06, and 4Z06.
Enrolment is limited.

HISTORY 4X06 SPECIAL TOPICS IN THE HISTORY OF MODERN SCIENCE
A study of the scientific revolution and its impact on western culture in the 19th and 20th centuries.
Seminar (2 hrs.); two terms
Prerequisite: Registration in Level III or IV of any Honours Programme; or permission of the Department.
Enrolment is limited.
Not offered in 1989-90.

HISTORY 4Z06 INTRODUCTION TO SOCIAL HISTORY
An introduction to theories of societal analysis and the historiography of the new social history with specific reference to their application to Canadian social history.
Seminar (2 hrs.); two terms
Prerequisite: Registration in Level III or IV of any Honours programme in History; or permission of the Department.
Students may take only two of History 4N06, 4V06, 4W06 and 4Z06.
Enrolment is limited.
Not offered in 1989-90.

The following courses in the field of History are offered by the Department of Classics:

Classical Civ. 2U03	Greek Society
Classical Civ. 2V03	Roman Society

For **Graduate Courses** see *Calendar of School of Graduate Studies.*

Humanities (General)

HUMANITIES 1C03 CRITICAL THINKING
This course aims to improve skills in analyzing and evaluating arguments and presentations found in everyday life and academic contexts, and to improve critical judgement.
2 lects., one tut.; one term
Prerequisite: Open. Not available to students with credit in or registered in Humanities 1A06, Humanities 2A06, Arts and Science 1B06, Philosophy 2J03 or Philosophy 2R03. Not to be used by Humanities I students as an R-group course.
Enrolment is limited.

HUMANITIES 2B06 THE THEMES OF WESTERN CIVILIZATION
A study of the ideas and issues that define the Western cultural tradition. The course views the concerns of modern artists and thinkers as a response to the two ancient sources of Western civilization, the Greek and the Biblical. It concentrates on four figures in four crucial periods: Socrates in the context of Greek philosophy and drama; St Paul and the Judaeo-Christian tradition; Shakespeare and the birth of a secular age; Wagner and Romantic decadence.
2 lects., 1 tut.; two terms
Prerequisite: Open. Not available to students with credit in Humanities 1B06. Further information regarding this course may be obtained from Dr. G. Roebuck (English) and Prof. S. Ajzenstat (Philosophy).
Not offered in 1989-90.

HUMANITIES 3B06 FROM ROMANTICISM TO MODERNISM
An introduction to the major intellectual and aesthetic currents in Europe from the beginning of the nineteenth century to approximately 1920.
3 lects; two terms
Prerequisite: Registration in Level III or IV of any programme in the Faculty of Humanities.
Same as Comparative Literature 3B06.

Italian

Courses and programmes in *Italian* are administered within the Department of Modern Languages of the Faculty of Humanities.

Faculty as of January 15, 1989

Professors

Antonio G. Alessio/D. Litt. *(Genoa)*
Stelio Cro/L. en L. *(Buenos Aires)*, Dott. Ling. e Lett. *(Venice)*

Associate Professor

Gabriele Erasmi/B.A. *(Yale)*, M.A., Ph.D. *(Minnesota)*

Assistant Professors

Vittorina Cecchetto/B.A., M.A., Ph.D. *(Toronto)*
L. Diane Dyer/B.A., M.A., B.L.S., Phil.M. *(Toronto)*

Sessional Assistant Professor

Rosangela Mazzuca/B.A., M.A., Ph.D. *(Toronto)*

Department Note:

The completion of Italian 1Z06, 2Z06, 2A03 and 2D03 or the completion of Italian 1A06, 2A03, 2D03, 3D03, and 3DD3, with a weighted average of at least 10.0 (A –) by non-programme students, will result in a transcript notation indicating that the student has acquired a good working knowledge of spoken and written Italian.

Beginner's Language Courses

ITALIAN 1Z06 BEGINNER'S INTENSIVE ITALIAN
An intensive beginner's course designed for students with no prior knowledge of the language. This course gives the student a basic knowledge of Italian grammar and the opportunity to practice the spoken language.
This course is enhanced by a CALL (Computer-Aided Language Learning) module.
5 hrs.; two terms
Prerequisite: Open, except to graduates of Grade 13 or OAC Italian, or students with credit in or registered in Italian 1ZZ6. No student who either speaks or understands an Italian dialect or Standard Italian may register in the course without the permission of the Department.

Students with prior knowledge of the language as determined by a placement test may be required to take an appropriate alternative.

ITALIAN 1ZZ6 BEGINNER'S INTENSIVE ITALIAN FOR DIALECT SPEAKERS
An intensive beginner's course designed for students who understand an Italian dialect or Standard Italian. The course gives the student a basic knowledge of Italian grammar and the opportunity to practice the spoken language.
This course is enhanced by a CALL (Computer-Aided Language Learning) module.
5 hrs.; two terms
Prerequisite: Open, except to graduates of Grade 13 or OAC Italian, or students receiving credit for, or registered in, Italian 1Z06.

Students with prior knowledge of the language as determined by a placement test may be required to take an appropriate alternative.

Intermediate and Advanced Language and Literature Courses

ITALIAN 1A06 INTERMEDIATE ITALIAN
An intensive review of the grammatical structures of Italian and an introduction to composition, together with oral practice.
4 hrs.; two terms
Prerequisite: Grade 13 or OAC Italian; or permission of the Department. Not available to students with credit in or registered in Italian 2Z06.

ITALIAN 2A03 INTENSIVE ORAL PRACTICE IN ITALIAN
A conversation course designed to improve oral and aural proficiency in Italian.
2 hrs.; two terms
Prerequisite: Italian 1A06 or 2Z06, and registration in a programme in Italian; or permission of the Department. Departmental permission slip required.
Enrolment is limited.

ITALIAN 2D03 ADVANCED ITALIAN
This course is designed to improve and increase the student's oral and written proficiency through intensive exercises, compositions, and analysis of authentic linguistic data.
2 hrs.; two terms
Prerequisite: Italian 1A06 or 2Z06 with a grade of at least B –; or permission of the Department. Not available to students with credit in Italian 2D06.

ITALIAN 2E03 INTRODUCTION TO ITALIAN LITERATURE I
A study of the development of Italian literature from its beginnings up to the 16th century with emphasis on major authors and works. This will include some account of its influence upon other European literatures.
3 lects.; one term
Prerequisite: Italian 1A06; or concurrent registration in Italian 2Z06, and registration in a programme in Italian; or permission of the Department. Not available to students with credit in Italian 2E06.

ITALIAN 2EE3 INTRODUCTION TO ITALIAN LITERATURE II
A study of the development of Italian literature from the 17th century to the present with emphasis on major authors and works.
3 lects.; one term
Prerequisite: Italian 2E03, and registration in a programme in Italian; or permission of the Department. Not available to students with credit in Italian 2E06.

ITALIAN 2Z06 ITALIAN GRAMMAR PRACTICE
An intensive review of the grammatical structures of Italian and an introduction to composition, together with oral practice.
4 hrs.; two terms
Prerequisite: Italian 1Z06 or Italian 1ZZ6; or permission of the Department. Not available to students registered in or with credit in Italian 1A06.

ITALIAN 3A03 NINETEENTH-CENTURY ITALIAN NOVEL
A study of the prose literature of the 19th century with special emphasis on the works of Manzoni and Verga.
3 lects.; one term
Prerequisite: Italian 2E06 or 2EE3; or permission of the Department.
Alternates with Italian 3G03.

ITALIAN 3DD3 INTENSIVE LANGUAGE PRACTICE
An intensive oral language practice course, designed for the systematic comparison and interpretation of Italian and English discourse strategies.
2 hrs.; two terms
Prerequisite: Italian 2A03, and registration in a programme in Italian; or permission of the Department.
Enrolment is limited.

ITALIAN 3D03 ITALIAN STYLISTICS & ORAL PRACTICE
An introduction to the study of Italian stylistics through an intensive and systematic analysis of Italian clause, sentence and discourse structure.
2 hrs.; two terms
Prerequisite: Italian 2D06, or 2A03 and 2D03, with a grade of at least B – or permission of the Department. Not available to students with credit in Italian 3D04.

ITALIAN 3G03 ITALIAN ROMANTIC POETRY
A study of the poetry of the Romantic Era with special emphasis on the works of Foscolo, Manzoni, Leopardi.
3 lects.; one term
Prerequisite: Italian 2E06 or 2EE3; or permission of the Department.
Alternates with Italian 3A03. Not offered in 1989-90.

ITALIAN 3M03 TWENTIETH-CENTURY ITALIAN NOVEL
A study of the major Italian novelists of the 20th century with emphasis placed on neorealism and its influence on contemporary Italian culture.
3 lects.; one term
Prerequisite: Italian 1A06 or 2Z06; Italian 2E06 or 2EE3; or permission of Department.

ITALIAN 3P03 ITALIAN THEATRE OF THE 19TH AND 20TH CENTURIES
A study of 19th- and 20th-century Italian drama with special emphasis on the works of Pirandello.
3 lects.; one term
Prerequisite: Italian 2E06 or 2EE3; or permission of Department.
Alternates with Italian 3Q03.

ITALIAN 3Q03 ITALIAN THEATRE FROM THE 16TH TO THE 18TH CENTURIES
A study of Italian Theatre from the 16th to the 18th century with special emphasis on *Commedia dell'arte*, Goldoni and Alfieri.
3 lects.; one term
Prerequisite: Italian 2E06 or 2EE3; or permission of Department.
Alternates with Italian 3P03. Not offered in 1989-90.

ITALIAN 3R03 THE TRECENTO I
The historical background of the 14th century Italian literature: Dante's *Divina commedia*. The emphasis will be on the first two *cantiche*.
3 lects.; one term
Prerequisite: Italian 2EE3; or permission of the Department. Not available to students with credit in Italian 3R06.

ITALIAN 3RR3 THE TRECENTO II
A study of the major works of Petrarch, particularly *Il Canzoniere*, and Boccaccio, with emphasis on *Il Decamerone*.
3 lects.; one term
Prerequisite: Italian 3R03; or permission of the Department. Not available to students with credit in Italian 3R06.

ITALIAN 4C03 THE LITERATURE OF THE RISORGIMENTO
A study of the period of 1816-1873 in Italian literature through selected texts, with reference to the political and social background.
3 lects.; one term
Prerequisite: Italian 2E06 or 2EE3; or permission of Department.
Not offered in 1989-90. Offered in alternate years. Alternates with Italian 4J03.

ITALIAN 4H03 ITALIAN HUMANISM
An analytical and comparative study of the scientific and literary ideas of the 14th, 15th and 16th centuries.
3 lects.; one term
Prerequisite: Italian 2E06 or 2EE3; or permission of the Department. Not available to students with credit in Italian 3L03.
Alternates with Italian 4R03.

ITALIAN 4I03 TOPICS IN ITALIAN CRITICISM
1989-90: Dante Criticism
A study of the main trends of criticism in Dante studies, mainly the historical and the figural methodologies. Emphasis will be on 19th and 20th Century critics, such as F. De Sanctis, M. Barbi, E.G. Parodi, P. Toynbee, E. Auerbach, E. Gilson, C.S. Singleton and N. Frye.
3 lects.; one term
Prerequisite: Italian 3RR3 or 3R06; or permission of the Department.
Topic alternates with Italian 4P03.

ITALIAN 4J03 CONTEMPORARY ITALIAN POETRY
A study of the major Italian poets of the 20th century with special emphasis on Saba, Montale, Ungaretti, Quasimodo.
3 lects.; one term
Prerequisite: Italian 1A06 or 2Z06; Italian 2E06; or permission of Department.
Alternates with Italian 4C03.

ITALIAN 4L04 INTRODUCTION TO ITALIAN LINGUISTICS
An introduction to the study of synchronic and diachronic Italian linguistics, to the problem of dialect fragmentation, to the *Questione della Lingua* and to early documents of Italian.
2 lects.; two terms
Prerequisite: Italian 1A06 or 2Z06; Italian 2E06 or 2EE3; or permission of Department.

ITALIAN 4M03 INTENSIVE COMPOSITION, STYLISTICS AND ORAL PRACTICE IN ITALIAN
An advanced language study course designed to develop the student's skills in composition, stylistics and conversation. Practice materials will be drawn from 20th-century literary works for the purpose of language study.
2 tuts.; two terms
Prerequisite: A grade of at least B– in Italian 3D04 or 3D03, and registration in Level IV of an Italian programme; or permission of the Department.

ITALIAN 4P03 DANTE
The vision of Dante: a study of *Paradiso* and readings from the *Vita Nuova*, and the *Convivio*.
3 lects.; one term
Prerequisite: Italian 3R06 or 3RR3; or permission of the Department.
Not offered in 1989-90.

ITALIAN 4R03 ITALIAN RENAISSANCE LITERATURE
An introduction to the study of the Italian epic with emphasis on the works of Ariosto and Tasso.
3 lects.; one term
Prerequisite: Italian 2E06 or 2EE3; or permission of the Department. Not available to students with credit in Italian 3O03.
Not offered in 1989-90. Alternates with Italian 4H03.

ITALIAN 4Z03 THE DEVELOPMENT OF THE ROMANCE LANGUAGES
A general introduction to the history and present state of the principal Romance Languages (French, Italian and Spanish). The course will trace the evolution of sound systems (phonology), forms (morphology) and sentence structures (syntax) through a study of representative texts.
3 lects.; one term.
Prerequisite: Registration in Level III or IV of an Italian programme.
Not offered in 1989-90. Offered in alternate years.
Same as French 4Z03.

ITALIAN 4ZZ3 INDEPENDENT STUDY
In this course the student will prepare, under the supervision of a faculty member, a research paper involving independent study in an area where the student has already demonstrated competence.
Prerequisite: Registration in Level IV of an Italian programme, and permission of the departmental Independent Study Committee.

Japanese

Japanese courses are administered within the Department of Modern Languages of the Faculty of Humanities. When supplemented by other courses in Japanese history, society, and culture, this sequence of language courses will enable students to develop a substantial minor area of concentration in Japanese studies.

Information and counselling may be obtained from the instructor, Mr. Yoichi Haruta (Togo Salmon Hall, Room 611).

JAPANESE 1Z06 BEGINNERS' INTENSIVE JAPANESE
This course is designed to give students basic conversational skills in Japanese, while reading and writing exercises help to reinforce their understanding of the language.
5 hrs.; two terms
Prerequisite: Open. Students with prior knowledge of the language as determined by a placement test may be required to take an appropriate alternative.

JAPANESE 2Z06 INTERMEDIATE INTENSIVE JAPANESE
This course aims to develop students' communicative skills in Japanese through speaking, listening, reading and writing practice. Emphasis is on a more refined knowledge of Japanese grammar and expansion of vocabulary.
4 hrs.; two terms
Prerequisite: Japanese 1Z06, with a grade of at least B–; or permission of the Department of Modern Languages.

JAPANESE 3Z03 ADVANCED JAPANESE
This course continues the study of written and spoken Japanese begun in Japanese 1Z06 and 2Z06. Particular attention will be focused on the development of the following language skills: conversational practice based on situational drills; study of advanced grammar structures; development of reading skills based on selected literary materials; writing short essays; continued study of kanji.
2 hrs.; two terms
Prerequisite: Japanese 2Z06; or permission of the instructor.

Labour Studies

The *Honours B.A. Programme* and the *B.A. Programme* in Labour Studies are supervised and co-ordinated by an interdisciplinary Committee of Instruction consisting of:

A.L. Robb (Director of Labour Studies)/*Chairman*
R. Adams (Business)
M. Basadur (Business)
P. George (ex officio)
W. Lewchuk (Economics/Labour Studies)
B. Stein (Social Work)
R. Storey (Labour Studies/Sociology)
V. Walters (Sociology)
C. Yates (Labour Studies/Political Science
I. Zeytinoglu (Business)

LABR ST 1AA3 AN INTRODUCTION TO ISSUES IN LABOUR STUDIES
An introduction to major issues in the field of Labour Studies. Topics will include the nature of work, technology, occupational health and safety, labour-management relations and the role of government.
Lectures and discussion; one term
Prerequisite: Open.

LABR ST 1A03 AN INTRODUCTION TO THE CANADIAN LABOUR MOVEMENT
An examination of the impact of economic, social, cultural and political factors on the historical evolution, structure and actions of the Canadian working class and labour movement.
Lectures and discussions; one term
Prerequisite: Open.

LABR ST 2A06 TRADE UNIONS
An overview of the functioning of contemporary unions in Canada. Areas studied will include: union administration, union policy and the impact of unions on working conditions and on Canadian society.
Lectures and discussion; two terms
Prerequisite: Registration in a Labour Studies programme. Not available to students with credit in Labour Studies 2A03.

LABR ST 2B03 SOCIAL WELFARE I

An examination of social welfare policy and the income security system in Canada in historical perspective.

Lectures and discussion; one term

Prerequisite: Registration in a Labour Studies programme.

Same as Term I of Social Work 2B06. (Students not in a Social Work programme must register for this course as Labour Studies 2B03.)

LABR ST 2BB3 SOCIAL WELFARE II

An examination of particular social problems and the institutional arrangements intended to address them.

Lectures and discussion; one term

Prerequisite: Labour Studies 2B03 and registration in a Labour Studies Programme. *Must be taken in the same academic session as Labour Studies 2B03.*

LABR ST 2C03 THEORETICAL FOUNDATIONS OF THE LABOUR MOVEMENT

An examination of political, sociological and economic explanations of labour behaviour in industrial society. The focus will be on attempts to explain why labour has tended to organize as well as the different strategies which labour has pursued to achieve its goals.

Lectures and discussion; one term

Prerequisite: Registration in a Labour Studies programme. Not available to students with credit in Labour Studies 1B03.

LABR ST 3A06 CURRENT LABOUR ISSUES

An analysis of contemporary issues such as technology, industrial democracy, work-sharing and part-time work. Topics will be discussed in relation to current and proposed public policies.

Lectures and discussion; two terms

Prerequisite: Registration in a Labour Studies programme. Not available to students with credit in Labour Studies 3A03.

LABR ST 3B03 ECONOMICS OF TRADE UNIONISM AND LABOUR

Topics will include the economics of the labour market, of trade unionism, of work, the impact of trade unions on the labour market, economic theories of strikes and trade unions and the state.

Lectures and discussion; one term

Prerequisite: Economics 1A06, and registration in a Labour Studies programme.

Same as Economics 2T03.

LABR ST 3C03 LABOUR LAW AND POLICY

An analysis of the concepts and fundamentals of Canadian labour law and an analysis of Canadian labour policy.

Lectures; one term

Prerequisite: Registration in a Labour Studies programme.

LABR ST 3D03 OCCUPATIONAL HEALTH AND SAFETY

An analysis of issues and problems associated with occupational health and safety in Canada and other industrialized countries. Topics will be examined from social, political, economic, legal and medical perspectives.

Lectures and discussion; one term

Prerequisite: Registration in a Labour Studies programme.

Offered in alternate years.

LABR ST 3E03 WOMEN, WORK AND TRADE UNIONISM

An examination of the historical and contemporary relations between women and work, and women and trade unionism. Topics will include the evolution and structure of the gender division of labour, women and the labour market, and the relationship of women to the labour movement.

Lectures and discussion; one term

Prerequisite: Registration in a Labour Studies programme.

Offered in alternate years.

LABR ST 3I03 THE SOCIOLOGY OF ORGANIZATIONS

A theoretical and empirical analysis of formal and informal organizational structures and processes in the major sectors of modern industrial society.

Lectures and discussion; one term

Prerequisite: Sociology 1A06, and registration in a Labour Studies programme.

Same as Sociology 2I03.

LABR ST 4A06 FIELD EXPERIENCE

Combined field experience and seminars to develop practice and research skills relating to labour issues. Students spend a minimum of the equivalent of one day per week in a labour union, government agency or other appropriate organization.

Seminar; two terms

Prerequisite: Registration in Level IV Honours B.A. in Labour Studies.

LABR ST 4B03 HONOURS SEMINAR

The seminar will provide an opportunity for in-depth study of selected topics relating to labour issues.

Seminar; one term

Prerequisite: Registration in Level IV Honours B.A. in Labour Studies.

LABR ST 4C03 PUBLIC SECTOR COLLECTIVE BARGAINING

This course examines unionization and collective bargaining for employees in the public, and para-public sectors. The topics covered include the origin and growth of public sector unions; models of public sector bargaining, legal aspects of bargaining rights and impasse resolution, bargaining issues and bargaining outcomes, and empirical studies of the effectiveness of dispute resolution procedures.

Lectures and discussion; one term

Prerequisite: Commerce 4BC3, and registration in Level III or IV of a Labour Studies programme. Open to students in Level IV of a Commerce programme with the permission of the instructor, the Chairman of the Labour Studies Committee of Instruction and the Undergraduate Student Advisor of the Faculty of Business.

LABR ST 4D03 COMPARATIVE INDUSTRIAL RELATIONS

A discussion of industrial relations, policies and practices in several selected countries. Topics will include the development, structure, objectives and strategies of labour and management organizations.

Lectures and discussion; one term

Prerequisite: Registration in Level III or IV of a Labour Studies programme. Open to students in Level IV of a Commerce programme with the permission of the instructor and the Chairman of the Labour Studies Committee of Instruction and the Undergraduate Student Advisor of the Faculty of Business.

Latin

(See *Classics, Latin*)

Linguistics

Linguistics is the study of language as a system of human communication. As a discipline it combines the methods of traditional scholarship and philosophy with those of observational and experimental science in order to investigate the nature, structure and development of languages everywhere in the world and of language as a uniquely human faculty.

Students may complete a degree in Linguistics in one of *three* ways:

a. A new Honours B.A. programme in Modern Languages and Linguistics is available. Details of this programme may be found in the section *Faculty of Humanities, Department of Modern Languages* in this Calendar. Information and counselling may be obtained from Dr. G. Thomas, the Co-ordinator of the Honours Modern Languages and Linguistics programme, in the Department of Modern Languages (Togo Salmon Hall, Room 622).

b. A thematic study of Linguistics is available through the Humanities Interdisciplinary B.A. programme. Details of this programme may be found in the section *Faculty of Humanities, Humanities Interdisciplinary B.A.* in this Calendar. Information and counselling may be obtained at the Office of the Associate Dean (Studies), Faculty of Humanities (Chester New Hall, Room 112).

c. Intensive study in Linguistics as a sub-discipline (30 units) may also be obtained through a concentration in Anthropology. The emphasis is on theoretical linguistics, covering all main branches of the field, along with intensive exposure to a broad range of languages, both Indo-European and non-Indo-European. The resulting B.A. will prepare the student for graduate work either in pure theoretical linguistics, or in language-oriented anthropological linguistics.

Note: Those students interested in pursuing graduate work in Linguistics would do well to take a substantial amount of language study as follows: 12 or more units of a modern European language; 6 additional units of a classical Indo-European language (Latin, Greek, or Sanskrit); and at least 3 units of a non-Indo-European language (Chinese, Japanese, Hebrew, Circassian, Ubykh or Abaza). Such a language background will allow them to meet the language requirement of many graduate programmes in linguistics. (See *Related Language Courses* and *Related Courses with Linguistics Content* at the end of the course descriptions in this section.)

LINGUIST 1A06 THE STUDY OF LANGUAGE

A far-reaching survey intended to acquaint the student with the numerous disciplines that deal with language and many of the crucial concepts and techniques developed within them. The course will enable the student to pursue higher studies in either linguistics or other language-related disciplines.

2 lects., 1 tut.; two terms

Prerequisite: Open.

Same as Anthropology 1B06.

LINGUIST 2A06 THE ORIGIN AND DEVELOPMENT OF THE MODERN EUROPEAN LANGUAGES

An introduction to the historical-comparative method in linguistics, with information on the history of English, French, German, Italian, Russian and Spanish. Other topics dealt with are the common lexical, morphological and syntactic features of the European languages, the European migrations, and etymology.

3 lects.; two terms

Prerequisite: Open to students in Level II and above.

Not offered in 1989-90.

LINGUIST 2L03 PHONETICS
A study of the sounds of language and the articulatory capabilities of man.
3 lects.; one term
Prerequisite: Open.
Same as Anthropology 2L03.

LINGUIST 2M03 PHONOLOGY
A study of the patterns of distinctive sounds in the world's languages.
3 lects.; one term
Prerequisite: Anthropology 2L03 or Linguistics 2L03; or permission of the instructor.
Same as Anthropology 2M03.

LINGUIST 2Q03 LINGUISTICS AND THE STUDY OF CULTURE
A study of the rise of analytical thinking as a distinct mode of thought, the use of such thinking in structural linguistics, and its extension to structuralism as practiced in anthropology and other disciplines. The work of Levi-Strauss will be examined.
3 hrs. (lects. and discussion); one term
Prerequisite: Registration in Level II or above, any programme.
Same as Anthropology 2Q03.

LINGUIST 2T03 SELECTED TOPICS IN ANTHROPOLOGICAL LINGUISTICS
An examination of Chomsky's generative theory of language and a critical assessment of its prospects as a new paradigm for mind and culture.
3 lects.; one term
Prerequisite: Anthropology 2Q03 or Linguistics 2Q03; or permission of the instructor.
Same as Anthropology 2T03.

LINGUIST 3A06 THE SOCIAL SITUATION OF THE MODERN EUROPEAN LANGUAGES
A survey of the social functions, changes in status and attendant linguistic problems of the languages of Europe. Among the topics covered are the growth of standard languages, modernization, dialects and dialect levelling, language planning, language attitudes, the impact of nationalism and internationalism, and the spread of European languages throughout the world.
3 lects.; two terms
Prerequsisite: Open to students in Level II and above.

LINGUIST 3I03 SYNTAX
A study of the human capacity to form words into sentences. The emphasis will be upon generative transformational grammar.
3 lects.; one term
Prerequisite: Open.
Same as Anthropology 3I03.

LINGUIST 3M03 MORPHOLOGY AND SEMANTICS
The study of word formation and patterns of meaning in language.
3 lects.; one term
Prerequisite: Anthropology 3I03 or Linguistics 3I03; or permission of the instructor.
Same as Anthropology 3M03.

LINGUIST 3P03 PRAGMATICS AND DISCOURSE
A discussion of the problems confronting the linguist in the study of text and discourse at the level beyond the sentence. The course will deal with the interaction between grammmar and situational factors.
Prerequisite: Open to students in Level III or IV of the Modern Language and Linguistics programme or Honours French: Programme B; or permission of the Programme Co-ordinator (TSH-622).
Offered in alternate years.

LINGUIST 3Y03 HISTORICAL LINGUISTICS
An advanced course covering the techniques for reconstructing ancestral languages. Language families, cognate sets, sound laws, internal and comparative reconstruction, and mechanisms of change will be treated.
3 hrs. (lects. and discussion); one term
Prerequisite: Anthropology 2L03 and 2M03, or Linguistics 2L03 and 2M03; or permission of the instructor.
Same as Anthropology 3Y03.

LINGUIST 4A06 THE APPLICATIONS OF LINGUISTICS
This course is concerned with ways in which the study of linguistics can be applied to neighbouring disciplines and to problems of human communication.
Seminar (2 hrs.); two terms
Prerequisite: Linguistics 2A06 and 3A06, and registration in the Modern Languages and Linguistics programme; or permission of the Programme Co-ordinator.
Not offered in 1989-90.

LINGUIST 4K03 ADVANCED TOPICS IN LINGUISTICS
An advanced course covering many areas of linguistic theory through the intensive examination of a language or set of languages.
3 hrs. (lects.); one term
Prerequisite: 12 units of Linguistics above Level I; or permission of the instructor.
Same as Anthropology 4K03.

RELATED LANGUAGE COURSES

The following courses are related to the study of Linguistics. For course descriptions and prerequisites, see the listings under each department.

Chinese 1Z06	Beginners Intensive Chinese
Hebrew 2A06	Hebrew
Hebrew 3A06	Intermediate Hebrew
Japanese 1Z06	Beginners' Intensive Japanese
Japanese 2Z06	Intermediate Intensive Japanese
Latin 1Z06	Beginners' Intensive Latin
Polish 1Z06	Beginners' Polish
Sanskrit 3A06	Introduction to Sanskrit Grammar
Sanskrit 4B06	Readings in Sanskrit Texts
Serbo-Croatian 1Z06	Introduction to Serbo-Croatian
Serbo-Croatian 2Z06	Intermediate Serbo-Croatian

RELATED COURSES WITH LINGUISTICS CONTENT

English 2V06	The English Language
French 2G03	French Language Practice: Elementary Translation
French 2H03	Introduction to French Linguistics
French 3B03	French Semantics
French 3CC3	French Language Practice: Intermediate Translation
French 3E03	Applied Linguistics
French 3G03	General and Comparative Phonetics
French 3I03	Sociolinguistics
French 4BB3	French Language Practice: Advanced Translation
French 4C03	French Morphology and Syntax
French 4E03	History of the French Language After 1600
French 4X03	Linguistics and Modern French Literary Criticism (From Structuralism to Semiotics)
French 4Z03	The Development of the Romance Languages
German 4CC3	Translation: Techniques and Practices
Italian 4L04	Introduction to Italian Linguistics
Italian 4Z03	The Development of the Romance Languages
Psychology 3G03	Development During Infancy
Russian 4J03	Topics in Russian Language I
Russian 4K03	Topics in Russian Language II

Manufacturing Engineering

(See Mechanical Engineering, Manufacturing Engineering)

Materials Science and Engineering

Faculty as of January 15, 1989

D.S. Wilkinson/*Chairman*

Professors

Z.S. Basinski/B.Sc., D.Phil., D.Sc. (*Oxford*), F.R.S., F.R.S.C., O.O.C/Research Professor.
J. David Embury/B.Sc. *(Manchester)*, Ph.D. *(Cambridge)*, P.Eng.
M. Brian Ives/B.Sc., Ph.D. *(Bristol)*, F.A.S.M., P.Eng.
Gyan G. Johari/B.Sc., M.Sc., Ph.D. *(Gorakhpur)*/Chair of Glass Science and Technology
D. Alan R. Kay/B.Sc., Ph.D. *(Glasgow)*
John S. Kirkaldy/M.A.Sc. *(British Columbia)*, Ph.D. *(McGill)*, F.R.S.C., F.A.S.M., P.Eng.
Wei-Kao Lu/B.S. *(Chen-Kung)*, Ph.D. *(Minnesota)*/The Stelco Chair in Metallurgy
Patrick S. Nicholson/B.Sc. *(Leeds)*, M.Sc., Ph.D. *(California, Berkeley)*, P.Eng.
G. Robert Piercy/M.A.Sc. *(British Columbia)*, Ph.D. *(Birmingham)*
Gary R. Purdy/M.Sc. *(Alberta)*, Ph.D. *(McMaster)*, P.Eng.
Walter W. Smeltzer/B.Sc. *(Queen's)*, Ph.D. *(Toronto)*, D.H.C. *(Dijon)*, F.R.S.C., F.A.S.M., P.Eng.
S.V. Subramanian/B.Sc. *(Banaras)*, M.Met., Ph.D. *(Sheffield)*/part-time
David S. Wilkinson/B.A.Sc. *(Toronto)*, Ph.D. *(Cambridge)*, P.Eng.

Associate Professors

Gordon A. Irons/B.A.Sc. *(Toronto)*, Ph.D. *(McGill)*, P.Eng.
Stuart R. MacEwen/B.A.Sc., M.A.Sc., Ph.D. *(Toronto)*/part-time
Dennis McCutcheon/B.Sc., M.B.A. *(McMaster)*
Brian W. Robertson/B.Sc., Ph.D. (*Glasgow*)/part-time.

Assistant Professors

Adrian Kitai/B.Sc. *(McMaster)*, Ph.D. *(Cornell)*
A. Petric/B.A.Sc. *(Toronto)*, Ph.D. *(Ecole Polytechnique)*

CERAMICS

CERAMICS 3A04 CERAMIC AND GLASS TECHNOLOGY
Ceramics: powder synthesis and characterization; surface electrochemistry; shaping and sintering. Glasses: melting, forming and quality control; annealing and tempering; ceramic and metallic glazes.
2 lects.; both terms
Prerequisites: Chemistry 2T05 or 2T06; Materials 2C04 or Metallurgy 2C03.

CERAMICS 4L04 SENIOR LABORATORY & PLANT VISITS
A series of experiments, each comprising five afternoons, that draw upon a broad spectrum of materials and techniques; includes industrial plant visits in first term and student seminars in second term.
2 labs. (3); both terms
Prerequisite: Materials 3B04, 3D06, Ceramics 3A04.
Same as Materials 4L04 and Metallurgy 4L04.

CERAMICS 4R03 CERAMIC SCIENCE
Microstructural development and properties of traditional ceramics. Acidic, basic, neutral and nonoxidizing refractories; ferro-electric, piezo-electric and ferromagnetic ceramics; super-ionic and structural ceramics.
3 lects., second term.
Prerequisite: Materials 3D06, 3E06 or registration in both Materials 3E06 and in Level IV of the Ceramic Engineering and Management Programme.

CERAMICS 4S03 GLASS SCIENCE
Theoretical and experimental aspects of silicates, polymers, metallic glasses and glass-ceramics. Modern concepts and application of non-crystalline solids.
3 lects., first term.
Prerequisite: Materials 3D06, 3E06.

MATERIALS

MATLS 1A03 INTRODUCTION TO MATERIALS
Introduction to fundamental concepts of bonding and atomic structure of condensed materials, with applications to silicate minerals, glasses, polymeric materials, and elementary metals and alloys.
2 lects., 1 tut.; first term
Prerequisite: Registration in or completion of Natural Sciences I. Not open to students who are registered in the Faculty of Engineering, or who are registered in or have completed Engineering 2O03.

MATLS 1B03 INTRODUCTION TO PROPERTIES OF MATERIALS
The structure of materials, its control and effect on properties; crystallography, microstructural development, stiffness and strength, plastic flow and fracture.
2 lects., 1 tut.; second term
Prerequisite: Credit or registration in Materials 1A03; or permission of the instructor. Not open to students who are registered in the Faculty of Engineering or who are registered in or have completed Engineering 2O03.

MATLS 2C04 INTRODUCTION TO MATERIALS PROCESSING
The application of chemical principles to materials processing, including metals, ceramics, plastics and electronic materials. Thermochemistry of oxides, sulphides and halides; electrochemistry; kinetics of heterogeneous reactions; interfacial phenomena.
3 lects., 1 tut. or lect.; second term
Prerequisite: Chemistry 2P06 or 2T06, which may be taken concurrently. Not open to students who have completed Metallurgy 2C03.

MATLS 2F03 EXPERIMENTAL METHODS AND COMPUTATION
The basic experimental methods of acquiring, analyzing and presenting data are applied to experiments which demonstrate the properties exhibited by solid materials. Computer methods in the acquisition and processing of experimental data.
1 lab. (3), first term, 2 labs. (3); second term
Prerequisite: Computer Science 1B03 or 1MA3 or Engineering 1D03 or 1D04, and Chemistry 1A06, and registration in a programme administered by the Department of Materials Science and Engineering.

MATLS 3B04 CRYSTALLOGRAPHY AND MICROSTRUCTURE
A laboratory course, complemented by lectures. Crystal structure and its determination by X-ray diffraction, microstructures of metals, alloys and ceramics and their correlation with phase equilibria.
1 lect., 1 lab. (3); both terms
Prerequisite: Materials 2F03.

MATLS 3D06 THERMODYNAMICS OF MATERIALS
Foundations of thermodynamics from classical, statistical, quantum mechanical and quasichemical points of view.
3 lects.; both terms
Prerequisite: Materials 2C04, and one of Chemistry 2P06, 2T06, Engineering 2W04, Physics 2H03, Chemical Engineering 2D04 and 2F04.

MATLS 3D03 THERMODYNAMICS OF MATERIALS I
The first half of Materials 3D06, with emphasis on 'classical' topics such as equilibrium, solid solutions and phase diagrams.
3 lects.; first term
Prerequisite: One of Chemistry 2P06, 2T06, Engineering 2W04, Physics 2H03, Chemical Engineering 2D04 and 2F04.

MATLS 3E06 TRANSPORT PROCESSES
Solution of problems involving diffusion in solids and their application to phase transformations. Mechanisms of diffusion. Heat transfer by conduction, convection and radiation, with application to materials processing. Emphasis on the setting up of kinetic relationships using conceptual models.
2 lects., 2 tut.; both terms
Prerequisite: Materials 2C04, and one of Mathematics 2M06, or 2P04 and 2Q04, or 2G03 and 2O03.

MATLS 3H03 THERMODYNAMICS OF MATERIALS II.
The second half of Materials 3D06, with emphasis on 'atomistic' topics such as statistical mechanics, ordering, interfaces and defects.
3 lects.; second term
Prerequisite: One of Chemistry 2P06, 2T06, Engineering 2W04, Physics 2H03, or Chemical Engineering 2D04 and 2F04.

MATLS 3P03 MECHANICAL BEHAVIOUR OF MATERIALS
Elastic and plastic deformation, creep, fatigue and fracture of engineering materials. Application to mechanical design. Microstructural descriptions of flow and fracture in crystalline and amorphous materials. Basic concepts of fracture mechanics.
3 lects., second term
Prerequisite: Engineering 2O03 or Materials 1A03 and 1B03, Engineering 2P04 or 2R04, and registration in a programme administered by the Department of Materials Science and Engineering.
Not open to students who have credit in or are registered in Engineering 3P03.

MATLS 4A01 INDUSTRIAL PROJECTS
The preparation of a report based on summer experience and/or industrial visits. The report will be defended orally. The Chairman should be consulted for detailed requirements, in the Spring of Level III.
Prerequisite: Registration in Level IV Ceramic, Materials or Metallurgical Engineering, Honours Materials Science or Materials Science Major.

MATLS 4D03 CORROSION
The oxidation of metals and alloys; electrochemical principles and methods applied to aqueous corrosion and its control.
3 lects.; second term
Prerequisite: One of Chemistry 2P06, 2T06, Chemical Engineering 2F04.

MATLS 4E03 PHASE TRANSFORMATIONS
The thermodynamics, kinetic and crystallographic aspects of phase transformations, with applications to the preparation and processing of materials. Solidification, recrystallization and heat treatment of steels, aluminum alloys and non-metallic materials.
3 lects.; first term
Prerequisite: Materials 3D03 or 3D06, and 3E06.

MATLS 4K04 SENIOR THESIS
Each student will have an individual experimental research problem. A preliminary written and oral report is required at the end of the first term. The thesis is defended orally. A minimum of six unscheduled hours each week, both terms.
Prerequisite: Registration in the final level of a programme administered by the Department of Material Science and Engineering.

MATLS 4L04 SENIOR LABORATORY & PLANT VISITS
A series of experiments, each comprising five afternoons, that draw upon a broad spectrum of materials and techniques; includes industrial plant visits in first term and student seminars in second term.
2 labs (3); both terms
Prerequisite: Materials 3B04 and 3D06.
Same as Ceramics 4L04 and Metallurgy 4L04.

MATLS 4M03 DISLOCATION THEORY
The behaviour of dislocations in solids. Crystallographic and elastic properties of dislocations, quantitative treatments of the yield stress, work hardening rate and strengthening mechanisms in metallic and non-metallic materials.
3 lects.; first term
Prerequisite: Engineering 2P04 and Materials 3B04.

MATLS 4Q03 CASE STUDIES
Analysis of current industrial problems, involving background science, cost analysis and process design.
2 lects., 1 tut.; second term.
Prerequisite: Materials 3B04, 3D06, 3E06.

MATLS 4T03 PROPERTIES AND PROCESSING OF COMPOSITES
Intrinsic properties of matrix and fibre materials; mechanics and thermodynamics of interfaces; mechanical properties and fabrication of engineering composites.
2 lects., 1 tut.; first term
Prerequisite: Materials 3E06.

METALLURGY

METALL 3C03 CHEMICAL METALLURGY I
The application of chemical principles to extractive metallurgy. Mineral processing, hydrometallurgy, electrometallurgy, reduction of iron ore, roasting and smelting of sulphide ores, electrowinning of aluminum and magnesium. Heat and mass balance calculations.
2 lects., 1 lab. (3); first term
Prerequisite: One of Chemistry 2P06, 2T06, Engineering 2W04.

METALL 4C04 CHEMICAL METALLURGY II
Theory and practice of ironmaking. Heat and material balances, ironmaking reactors, raw materials, direct reduction and new processes. Thermodynamics and kinetics of steelmaking. Hot metal treatment; static and dynamic process control; deoxidation; casting; specialty steelmaking; inclusion engineering.
2 lects.; both terms
Prerequisite: Metallurgy 3C03, or registration in Level IV or V of a programme in Ceramic Engineering.

METALL 4L04 SENIOR LABORATORY & PLANT VISITS
A series of experiments, each comprising five afternoons, that draw upon a broad spectrum of materials and techniques; industrial plant visits in first term and student seminars in second term.
2 labs. (3); both terms
Prerequisite: Materials 3B04 and 3D06.
Same as Materials 4L04 and Ceramics 4L04.

METALL 4N03 KINETICS AND REACTOR ANALYSIS IN METALLURGICAL SYSTEMS
Homogeneous and heterogeneous kinetics. Ideal and non-ideal reactor models. Mixing and turbulence. Interfacial reactions in two and three phase systems. Statistical process control.
3 lects.; first term
Prerequisite: Materials 3E06, which may be taken concurrently with the permission of the instructor.

RELEVANT ENGINEERING COURSES
See *Engineering (General)* for course descriptions.

Engineer 2O03	Structure and Properties of Engineering Materials
Engineer 3Q03	Electronic Properties of Solids
Engineer 3R03	Properties and Selection of Engineering Materials
Engineer 4J03	Metal Forming

For **Graduate courses**, see the *Calendar of the School of Graduate Studies.*

Mathematics and Statistics

Faculty as of January 15, 1989

Ian Hambleton/*Chairman*
I.Z. Chorneyko/*Associate Chairman*

Professors Emeriti

Ernest A. Behrens/D.Phil.nat (*Hamburg*)
F.R. Britton/B.Sc. (*Wales*), M.A. (*McMaster*), Ph.D. (*Toronto*)
Charles W.Dunnett/M.B.E., B.A. (*McMaster*), M.A. (*Toronto*), D.Sc. (*Aberdeen*)
Gerard Field/B.Sc., Ph.D. (*London*)
Norman D. Lane/B.A. (*Queen's*), M.A., Ph.D. (*Toronto*)
Rubens G. Lintz/B.A., Ph.D. (*Sao Paulo*)
William J. McCallion/B.A., M.A. (*McMaster*)

Professors

Bernhard Banaschewski/Dipl. Math., Dr.rer.nat. (*Hamburg*), F.R.S.C., McKay Professor of Mathematics
Minaketan Behara/B.Sc., M.Sc. (*Utkal*), Ph.D. (*Saarbrücken*)
Claude E. Billigheimer/B.A., B.Sc., M.A. (*Melbourne*), Ph.D. (*Toronto*)
Gunter W.A. Bruns/Dr.rer.nat. (*Berlin*)
John M. Chadam/B.A. (*Toronto*), S.M., Ph.D (*MIT*)
Tae Ho Choe/B.S., B.Sc., M.A. (*Kyungpook*), Ph.D. (*Florida*)
Joseph Csima/Dipl. Math. (*Eotvos, Budapest*), Ph.D. (*Toronto*)
Thomas M.K. Davison/B.Sc. (*Sir George Williams*), M.A., Ph.D. (*Toronto*), Undergraduate Advisor
Ian Hambleton/B.Sc., M.Sc. (*Toronto*), Ph.D. (*Yale*)
Hans P. Heinig/B.Sc. (*McMaster*), M.A. (*Western*), Ph.D. (*Toronto*)/ Graduate Advisor, Mathematics
Fred M. Hoppe/B.Sc. (*Toronto*), M.Sc. (*Weizmann Institute of Science*), M.A., Ph.D. (*Princeton*)
Taqdir Husain/B.A., M.A. (*Aligarh*), Ph.D. (*Syracuse*)
Peter D.M. Macdonald/B.Sc., M.Sc. (*Toronto*), D.Phil. (Oxford)/ Graduate Advisor, Statistics
S. Gopal Mohanty/B.A. (*Utkal*), M.A. (*Panjab*), Ph.D. (*Alberta*)
Bruno J.W. Mueller/B.Sc. (*Göttingen*), M.Sc., Ph.D. (*Mainz*)
Carl R. Riehm/B.A. (*Toronto*), Ph.D. (*Princeton*)
Alexander Rosa/M.S. (*Kiev State*), Ph.D. (*Slovak Acad. Sciences*)
Eric T. Sawyer/B.Sc., Ph.D. (*McGill*)
Victor P. Snaith/B.A., M.A., Sc.D. (*Cambridge*), M.Sc., Ph.D. (*Warwick*), F.R.S.C., Britton Professor of Mathematics
Donald W.L. Sprung/B.A. (*Toronto*), Ph.D., D.Sc. (*Birmingham*), Professor of Physics
James D. Stewart/B.Sc., (*Toronto*), M.S. (*Stanford*), Ph.D. (*Toronto*)
Moti L. Tiku/B.A. (*Kashmir*), M.A. (*Punjab*), M.Sc. (*Patna*), Ph.D., D.Sc. (*Aberdeen*)
Patrick C. Yip/B.Sc. (*Memorial*), Ph.D. (*McMaster*)

Associate Professors

Pulak C. Chakravarti/B.Sc. (*Calcutta*), M.Sc., Ph.D. (*London*)
Ihor Z. Chorneyko/B.A., M.A. (*Saskatchewan*), Ph.D. (*Alberta*)
Ernst O. Gadamer/Diplom Physiker (*Frankfurt*), M.A., Ph.D. (*Toronto*)
Manfred Kolster/Dipl. (*Hamburg*), Dr. rer. nat. (*Saarbrücken*), Habilitation (*Münster*)
Zdislav V. Kovarik/M.Sc. (*Charles, Prague*), Ph.D. (*Toronto*)
Ernest R. Mead/B.A., M.A., Ph.D. (*Western*), A.S.A.
Maung Min-Oo/B.Sc. (*Rangoon*), Dipl. Math., Ph.D., Habilitation (*Bonn*)
Gregory H. Moore/B.A. (*Berkeley*), M.A., M.Sc., Ph.D. (*Toronto*)
A.J. Nicas/B.Sc. (*McGill*), M.A., Ph.D. (*Princeton*)
McKenzie Y.-K. Wang/A.B. (*Princeton*), Ph.D. (*Stanford*)

Assistant Professors

N. Balakrishnan/B.Sc., M.Sc. (*Madras*), Ph.D. (*I.I.T., Kanpur*)
Jean-Pierre Gabardo/B.Sc. (*Université de l'Etat à Mons*), Ph.D. (*Maryland*)
Anton M. Jopko/B.Sc., M.Sc., Ph.D. (*McMaster*), Dipl. Educ. (Althouse)/part-time
Anthony Peirce/B.Sc., B.Sc. (Hons.) (*Orange Free State*), M.Sc. (*Witwatersrand*), M.A., Ph.D. (*Princeton*)
Gordon Slade/B.A.Sc., M.Sc. (*Toronto*), Ph.D. (*British Columbia*)
Matthew A. Valeriote/B.Math, (*Waterloo*), Ph.D. (*Berkeley*)
Gail S.K. Wolkowicz/B.O.T., B.Sc., M.Sc. (*McGill*), Ph.D. (*Alberta*)

Associate Members

C.H. Goldsmith/ (*Clinical Epidemiology and Biostatistics*) B.Sc., M.Sc. (*Manitoba*), Ph.D. (*North Carolina State*)
Patrick J. Ryan/ (*Computer Science and Systems*) B.Sc. (*Toronto*), Ph.D. (*Brown*)
William F. Smyth/ (*Computer Science and Systems*) B.A. (*Toronto*), M.Sc. (*Ottawa*)

Department Notes:

1. ★ Course is not necessarily offered every session; consult the Chairman of the Department or an Associate Dean of Science (Studies).
2. Students registered in an *Arts and Science Programme* should note that *Arts and Science 1D06 Calculus* serves as an equivalent prerequisite for all upper level Mathematics and Statistics courses, for which Mathematics 1A06 is a prerequisite.

MATH 1A06 CALCULUS I
This is a course in differential and integral calculus with emphasis on the fundamental processes and applications.
3 lects., 1 tut.; two terms
Prerequisite: Grade 13 or OAC Calculus.

MATH 1B03 LINEAR ALGEBRA I
Vectors, matrices, determinants, vector spaces, complex numbers.
3 lects., 1 tut.; one term
Prerequisite: A Grade 13 or OAC Mathematics Course. Not open to students who have credit in Mathematics 1G04.

MATH 1C06 CALCULUS FOR LIFE SCIENCES
This is a course in differential and integral calculus with emphasis on fundamental processes. Applications to the life sciences will be stressed.
3 lects., 1 tut.; two terms
Prerequisite: Grade 13 or OAC Calculus. Not open to students who are registered in, or have credit in Mathematics 1A06, 1F06, 1M03, 1N06.

MATH 1H05 ENGINEERING MATHEMATICS I
Matrices and determinants; complex numbers; vector algebra; multi-variable calculus.
3 lects., 1 tut.; first term;
2 lects., 1 tut.; second term
Prerequisite: Registration in Engineering I.

MATH 1K03 INTRODUCTORY CALCULUS FOR BUSINESS AND THE SOCIAL SCIENCES
An introduction to differential and integral calculus.
3 lects., 1 tut.; one term
Prerequisite: Grade 12 Mathematics. Not open to students who are registered in, or have credit in, any of Mathematics 1A06, 1C06, 1F06, 1M03, 1N06. Normally not open to students who have completed Grade 13 or OAC Calculus.

MATH 1L03 LINEAR ALGEBRA AND PROBABILITY FOR BUSINESS AND THE SOCIAL SCIENCES
An introduction to vectors, matrices, determinants, probability theory.
3 lects., 1 tut.; one term
Prerequisite: Grade 12 Mathematics. Not open to students who are registered in, or have credit in, any of Mathematics 1B03, 1B04, 1F06, 1G04. Not open to students in Science or Engineering programmes.

MATH 1M03 CALCULUS FOR BUSINESS AND THE SOCIAL SCIENCES
Differential and integral calculus.
3 lects., 1 tut.; one term
Prerequisite: Mathematics 1K03, or Grade 13 or OAC Calculus. Not open to students who are registered or have credit in, one of Mathematics 1A06, 1C06, 1F06, 1N06.

MATH 1N06 CALCULUS FOR ENGINEERING
Differential and integral calculus; sequences and series; differential equations.
3 lects., 1 tut.; two terms
Prerequisite: Registration in Engineering I.

MATH 2A06 CALCULUS II
Partial differentiation and differentiability of functions of several variables, extremal problems with constraints, implicit function theorem, multiple integrals, line and surface integrals, Green's, Gauss', Stokes' Theorems and systems of differential equations.
3 lects.; two terms
Prerequisite: Mathematics 1A06 or 1C06, and one of Mathematics 1B03, 1B04, 1G04. Not open to students who are registered in, or have credit in, Mathematics 2G03.

MATH 2B06 LINEAR ALGEBRA II
Vector spaces, linear transformations, polynomials, determinants, canonical forms, Jordan forms, inner product spaces, bilinear forms, introduction to groups of linear transformations.
3 lects.; two terms
Prerequisite: Mathematics 1A06 or 1C06 and one of Mathematics 1B03, 1B04, 1G04. Not open to students who are registered or have credit in, Mathematics 2J06.

MATH 2C03 DIFFERENTIAL EQUATIONS
Ordinary differential equations, first-order differential equations. Laplace transforms, series solutions; introduction to partial differential equations, separation of variables.
3 lects.; one term
Prerequisite: Mathematics 1A06 or 1C06 or 1N06, and one of Mathematics 1B03, 1B04, 1G04, 1H05. Not open to students who are registered in, or have credit in, Mathematics 2O03.

MATH 2E03 INTRODUCTION TO MODELLING
General features of modelling. Examples from chemistry, physics, biology and economics are treated by a variety of elementary methods. Computer packages are used when appropriate.
3 lects.; one term
Prerequisite: Mathematics 1A06 or 1C06.

MATH 2F03 SETS AND NUMBERS
Elementary operations on sets, relations, functions, equivalence relations and partitions, partially ordered sets, equipotence of sets and its basic properties, the real number system.
3 lects.; one term
Prerequisite: Registration in an Honours programme in Mathematics; or permission of the instructor. Not open to students who are registered in, or have credit in, Mathematics 2J06.

MATH 2G03 INTERMEDIATE CALCULUS
Differential calculus of several variables, multiple integrals, line and surface integrals.
3 lects.; one term
Prerequisite: Mathematics 1A06 or 1C06, and one of Mathematics 1B03, 1B04, 1G04. Not open to students who are registered in, or have credit in, Mathematics 2A05 or 2A06.

MATH 2H03 IDEAS IN MATHEMATICS
Selected topics from: set theory, non-Euclidean and projective geometries, number theory, probability and statistics, algebraic systems. No specific background in mathematics is assumed.
3 lects.; one term
Prerequisite: Registration in Level II, III, or IV of a non-Science programme.

MATH 2J06 LINEAR ALGEBRA AND SET THEORY
Sets, relations, and functions; the Axiom of Choice; the real number system; vector spaces, transformations, matrices and linear equations; eigenvalues and diagonalization of matrices; inner products.
3 lects.; two terms
Prerequisite: Mathematics 1A06 or 1C06, and one of Mathematics 1B03, 1B04, 1G04. Not open to students who are registered in, or have credit in, Mathematics 2B04, 2B06, 2F03, 2F04.

MATH 2K03 FINANCIAL MATHEMATICS
Nominal and effective rates of interest and discount, forces of interest and discount, compound interest, annuities certain; amortization, sinking funds; bonds, security evaluation, determination of yields.
3 lects.; one term
Prerequisite: One of Mathematics 1A06, 1C06, 1F06, 1M03; or permission of the instructor.

MATH 2L03 INTERMEDIATE CALCULUS AND DIFFERENTIAL EQUATIONS FOR BUSINESS AND THE SOCIAL SCIENCES
Functions of several variables, partial differentiation, chain rule, and extremal problems. First and second order differential equations, difference equations.
3 lects.; one term
Prerequisite: One of Mathematics 1A06, 1C06 or 1M03, and one of Mathematics 1L03, 1B03, 1B04, 1G04. Not open to students who are registered in, or have credit for, Mathematics 2A05, 2A06, 2C03, 2C04, 2G03, 2O03, 2N03. Not open to students in Science or Engineering programmes.

MATH 2M06 ENGINEERING MATHEMATICS II
Ordinary differential equations, Laplace transforms, Fourier series, vector calculus, orthogonal curvilinear coordinates, integral theorems, with engineering applications.
3 lects.; two terms
Prerequisite: Mathematics 1N06 and 1H05.

MATH 2N03 INTERMEDIATE MATHEMATICS FOR CHEMISTRY
Three dimensional analytic geometry and vectors, partial derivatives, multiple integrals, first order differential equations, linear differential equations.
3 lects.; one term
Prerequisite: Mathematics 1A06 or 1C06, and one of 1B03, 1B04 or 1G04, and registration in a Chemistry Programme. Not open to student who are registered in, or have credit for, Mathematics 2A05, 2A06, 2C03, 2C04, 2G03, 2L03, 2O03.

MATH 2O03 DIFFERENTIAL EQUATIONS
Ordinary differential equations with constant coefficients, series solutions, special methods; Laplace transforms, Fourier series; introduction to partial differential equations.
3 lects.; one term
Prerequisite: Mathematics 1A06, 1C06 or 1N06, and one of Mathematics 1B03, 1B04, 1G04, 1H05. Not open to students who are registered in, or have credit in, Mathematics 2C03 or 2C04.

MATH 2P04 DIFFERENTIAL EQUATIONS FOR ENGINEERS
Ordinary differential equations, systems of linear ordinary differential equations, Laplace transform, power series solutions, Fourier series with engineering applications.
4 lects. or 3 lects. and 1 tut., every other week; one term
Prerequisite: Mathematics 1N06 and 1H05.

MATH 2Q04 ADVANCED CALCULUS FOR ENGINEERS
Vector algebra, curves, partial differentiation, multiple integrals, Green's Theorem, line and surface integrals, integral theorems, scalar and vector potentials, orthogonal curvilinear coordinates, introduction to partial differential equations.
4 lects. or 3 lects. and 1 tut., every other week; one term
Prerequisite: Mathematics 1N06 and 1H05.

MATH 3A06 REAL ANALYSIS
Development of the real number system, infinite series, differentiable functions of several variables. Stieltjes integral, uniform convergence, improper integrals and their applications.
3 lects.; two terms
Prerequisite: Mathematics 2A05 or 2A06, and 2B04 or 2B06; or a weighted average of at least 10.0 in Mathematics 2G03, 2J06, and 2O03.

MATH 3B03 FOUNDATIONS OF GEOMETRY
Topics chosen from affine, projective, spherical or hyperbolic geometry, curves and surfaces in 3-space.
3 lects.; one term
Prerequisite: Mathematics 2B04 or 2B06, or Mathematics 2J06.

MATH 3C03 MATHEMATICAL PHYSICS I
Linear algebra and eigenvalue problems; partial differential equations, orthogonal functions, Fourier series, Legendre functions, spherical harmonics.
3 lects.; one term
Prerequisite: Mathematics 2A05 or 2A06, and 2C03 or 2C04, or 2G03 and 2O03, or 2P04 and 2Q04, and Physics 2C05 or 2G03. Not open to students who are registered in, or have credit for, Mathematics 3J04, 3K03, 3V06.

MATH 3D03 MATHEMATICAL PHYSICS II
Functions of a complex variable, probability and statistics, boundary value problems, Bessel functions.
3 lects.; one term
Prerequisite: Mathematics 3C03. Not open to students who have credit in or are registered in Mathematics 3J04, 3K03, 3K05, 3V06.

MATH 3E03 ALGEBRA I
An introduction to groups including Sylow theorems and structure of finitely generated Abelian groups.
3 lectures; one term
Prerequisite: One of Mathematics 2B06, 2B04, 2J06. Not open to student with credit in Mathematics 3E06.

MATH 3EE3 ALGEBRA II
Modules over principal ideal domains, field extensions, integral closure.
3 lectures; one term
Prerequisite: Mathematics 3E03. Not open to students with credit in Mathematics 3E06.

MATH 3F03 ADVANCED DIFFERENTIAL EQUATIONS I

Existence theory, nth order linear systems (using Jordan canonical form), planar autonomous systems, Sturm-Liouville problems, Green's functions, applications.

3 lectures, one term

Prerequisite: Mathematics 2A06 or 2A05, 2B06 or 2B04, and 2C03 or 2C04 or Mathematics 2G03, 2J06 and 2O03. Not open to students with credit in Mathematics 3F06.

MATH 3FF3 ADVANCED DIFFERENTIAL EQUATIONS II

Fourier series and transforms, special functions, orthogonal expansions, first and second order partial differential equations (heat equation, wave equation and potential equation).

3 lectures, one term

Prerequisite: Mathematics 3F03. Not open to students with credit in Mathematics 3F06.

MATH 3G03⋆ PROBLEM SOLVING

Principles of problem solving and application to solutions of mathematical problems. Practice in developing problem-solving skills on problems from various areas of mathematics.

3 lects.; one term

Prerequisite: Completion of at least 12 units of Level II Mathematics or Statistics, and the permission of the instructor.

Enrolment is limited.

MATH 3H03⋆ NUMBER THEORY

Selected topics from: congruences and residues, continued fractions, approximation of irrationals, arithmetic in selected quadratic number fields, Diophantine equations, partitions, geometry of numbers, quadratic reciprocity.

3 lects.; one term

Prerequisite: Completion of 12 units of Level II Mathematics or Statistics.

MATH 3J04 ENGINEERING MATHEMATICS III

Topics in mathematics of interest for civil engineering, including probability and statistics, partial differential equations, numerical analysis; and matrix algebra.

4 hrs.; one term

Prerequisite: Mathematics 2M06.

MATH 3K03 ENGINEERING MATHEMATICS III

Complex variable theory with applications to electrical and computing engineering.

3 lects.; one term

Prerequisite: Mathematics 2P04 and 2Q04.

MATH 3L06⋆ MATHEMATICAL LOGIC AND BOOLEAN ALGEBRA

The Axiom of Choice and its equivalents, ordinal numbers, cardinal numbers and the basics of transfinite arithmetic, Boolean algebras, Heyting algebras and possibly other algebras relevant for logic, classical and nonclassical propositional logics with emphasis on completeness, compactness and decidability.

3 lects.; two terms

Prerequisite: Mathematics 2F03 or 2F04, or a grade of at least B− in Mathematics 2J06.

MATH 3O06 REAL ANALYSIS

Development of real numbers. Riemann Stieltjes integration; Gauss' and Stokes' Theorems; Jacobians, implicit function theorems. Taylor's expansions, pointwise, uniform, mean convergence; orthogonal functions, Fourier series.

3 lects.; two terms

Prerequisite: One of Mathematics 2A05, 2A06, 2G03.

MATH 3P03 GENERAL TOPOLOGY

Introduction to basic notions of general topology, various modes of defining topological spaces, continuity, convergence, separation axioms, compactness, connectedness.

3 lects.; one term

Prerequisite: Mathematics 2B04 or 2B06, or a grade of at least B in Mathematics 2J06.

MATH 3Q03 NUMERICAL ANALYSIS I

An introduction to the methods of numerical analysis, including methods for interpolation, numerical differentiation and integration, and the solution of transcendental, differential and matrix equation.

3 lects., one term

Prerequisite: Mathematics 2A05 or 2A06 or 2M06, and 2C03 or 2C04, or 2G03 and 2O03, or 2P04, 2Q04, and one of Computer Science 1B03 or 1MA3, 1H03 or 1ZA3, or Engineering 1D03.

MATH 3R03 LINEAR PROGRAMMING

The general linear programming problem, simplex procedures, dual problems, degeneracy procedures, parametric linear programming, additional procedures and applications.

3 lects.; one term

Prerequisite: One of Mathematics 1B03, 1B04, 1G04.

MATH 3T03 COMPLEX ANALYSIS I

Analytic functions, power series, elementary conformal mappings, Cauchy's Theorem, residue calculus.

3 lects.; one term

Prerequisite: One of Mathematics 2A05, 2A06, 2G03.

MATH 3V06 ENGINEERING MATHEMATICS III

Topics in mathematics of interest for mechanical, metallurgical and ceramic engineering, including probability and statistics, partial differential equations, numerical analysis.

2 hrs., first term; 4 hrs., second term

Prerequisite: Mathematics 2M06, or 2P04 and 2Q04.

MATH 3X03⋆ ACTUARIAL MATHEMATICS I

Survival distributions, life tables, life insurance, life annuities, net premiums and reserves.

3 lects.; one term

Prerequisite: Statistics 2D03 or 2D04, and Mathematics 2K03; or permission of the instructor.

Not offered in 1989-90. Offered in 1990-91 and alternate years.

MATH 3Y03⋆ ACTUARIAL MATHEMATICS II

Multiple life functions, multiple decrement models, valuation theory for pension plans.

3 lects.; one term

Prerequisite: Mathematics 3X03.

Not offered in 1989-90. Offered in 1990-91 and alternate years.

MATH 3Z03 HISTORY OF MATHEMATICS

An introduction to the history of mathematics, including interaction with other phases of culture, with special emphasis on the past three centuries.

3 lects.; one term

Prerequisite: At least two Level II Mathematics or Statistics courses other than Mathematics 2G03, 2H03, 2H06, 2K03, 2L03.

MATH 4A06 FUNCTIONS OF A COMPLEX VARIABLE

Study of analytic functions, their various representations, and their properties.

3 lects.; two terms

Prerequisite: Mathematics 3A06. Not open to students who are registered or have credit in, Mathematics 4O03.

MATH 4B06⋆ DIFFERENTIABLE MANIFOLDS

Introduction to differentiable manifolds, differential forms, integration on manifolds, topics in differential geometry.

3 lects.; two terms

Prerequisite: Mathematics 2A06 or 2A05 and 2B06 or 2B04, or a weighted average of at least 7.0 in Mathematics 2G03, 2J06 and 2O03, or Mathematics 3D03.

MATH 4C03⋆ COMBINATORICS

Inversion formulae, systems of distinct representatives, block designs and other configurations; and other topics.

3 lects.; one term

Prerequisite: One of Mathematics 2A05, 2A06, 2G03, and one of Mathematics 2B04, 2B06, 2J06; or permission of the instructor.

MATH 4E03 ALGEBRA III

Polynomial rings, ideal theory, Galois Theory.

3 lects.; one term

Prerequisite: One of Mathematics 3EE3, 3E04, 3E06.

MATH 4G03 THEORY OF GAMES

Two person zero sum and non-zero sum games, n-person games; other topics.

3 lects.; one term

Prerequisite: Mathematics 3A06 or 3O06.

MATH 4I03⋆ BANACH AND HILBERT SPACES

An introduction to L_p, Banach and Hilbert spaces, bounded linear operators, functionals, open mapping and closed graph theorems, duality, Riesz representation theorems; and other topics.

3 lects.; one term

Prerequisite: Mathematics 4K03 or 4K04; or permission of the instructor.

MATH 4J03 GRAPH THEORY

Graphs, trees, bipartite graphs, connectivity, graph colouring, matrix representations, applications.

3 lects.; one term

Prerequisite: One of Mathematics 2A05, 2A06, 2G03, and one of Mathematics 2B04, 2B06, 2J06.

MATH 4K03 MEASURE THEORY AND PROBABILITY

Introduction to the theory of measure and integration with applications to probability theory.

3 lects.; one term

Prerequisite: Mathematics 3A06, or a grade of at least A− in Mathematics 3O06.

MATH 4O03 COMPLEX ANALYSIS II

Consequences of Cauchy's theorem; entire functions; analytic continuation; theory of conformal mapping; and other selected topics.

3 lects.; one term

Prerequisite: Mathematics 3T03 or 3D03. Not open to students who are registered or have credit in, Mathematics 4A06.

MATH 4Q03 NUMERICAL ANALYSIS II

Underlying hypotheses, convergence and stability methods available for the solution of ordinary and quasilinear partial differential equations.

3 lects.; one term

Prerequisite: Mathematics 3Q03 or 3Q04.

MATH 4RR3 OPTIMIZATION

Non-linear programming methods, integer programming, quadratic programming, stochastic programming, and dynamic programming.

3 lectures; one term

Prerequisite: One of Mathematics 2A05, 2A06, 2G03, 2N03, and Mathematics 3R03.

MATH 4S03* FINITE AUTOMATA AND COMPUTABILITY
Finite automata, deterministic automata, regular languages, Turing machines, recursive functions, primitive recursive functions, decidability and undecidability with applications to formal language theory.
3 lects.; one term
Prerequisite: One of Mathematics 2F03, 2F04, 2J06.

MATH 4V03 APPLIED MATHEMATICAL ANALYSIS
Lebesgue integration, distribution theory, Fourier Analysis, partial differential equations, integral equations, calculus of variations; additional topics.
3 lects.; one term
Prerequisite: One of Mathematics 3D03, 3FF3, 3F06. Not open to students with credit in Mathematics 4V06.

MATH 4W03 DIRECTED READING
Directed reading in areas of mathematics of interest to the student and the instructor.
Prerequisite: Permission of the Chairman of the Department.

For **Graduate Courses** see *Calendar of School of Graduate Studies.*

STATISTICS

STATS 2D03 PROBABILITY THEORY I
Elementary theory of probability; random variables; discrete and continuous distributions including binomial, Poisson, hypergeometric, uniform, normal, X^2; bivariate distributions; moment-generating functions, limiting distributions, central limit theorems; applications.
3 lects.; one term
Prerequisite: One of Mathematics 1A06, 1C06 or 1M03, and one of Mathematics 1B03, 1B04, 1G04. Students with credit in Mathematics 1L03 may not retain this credit if Statistics 2D03 is taken.

STATS 2M03 STATISTICAL METHODS
Introduction to statistical methods and applications.
3 lects.; one term
Prerequisite: Mathematics 1A06, 1C06 or 1F06, or a grade of at least B in Mathematics 1K03 and 1L03. Not open to students who have completed any of Commerce 2QA3, Economics 2B03, Psychology 2R06, Statistics 2R06.

STATS 2R06 INTRODUCTORY STATISTICS WITH APPLICATIONS
Descriptive statistics, plotting data, computation of measures for data, probability, random variables, hypothesis testing, parameter estimation, analysis of variance, chi-square tests, distribution-free tests.
3 lects.; two terms
Prerequisite: Grade 13 or OAC Calculus or Mathematics 1K03. Not open to students who have completed any of Commerce 2QA3, Statistics 2D03, 2D04, 2M03, 3M03, Psychology 2R06, Economics 2B03.

STATS 3D06 MATHEMATICAL STATISTICS I
The multivariate normal distribution, point and interval estimation, sampling distributions, tests of hypotheses, elementary linear regression, and other topics.
3 lects.; two terms
Prerequisite: Statistics 2D03 or 2D04, and one of Mathematics 2A05, 2A06, 2G03, 2L03.

STATS 3N03 STATISTICAL METHODS FOR ENGINEERS
Introduction to statistical methods and applications: data analysis and statistical methods.
3 lects.; one term
Prerequisite: Registration in, or completion of, Levels III, IV or V Engineering.

STATS 3S03* SURVEY SAMPLING
Survey design; simple random sampling; stratified sampling; proportional allocation; ratio estimation; cluster sampling; systematic sampling and sample size determination. A project associated with current research is required.
3 lects.; one term
Prerequisite: Statistics 2D03 or 2D04, and Statistics 2M03 or 3M03; or permission of the instructor.

STATS 3U03 STOCHASTIC PROCESSES I
Random walk, Markov chains, discrete and continuous parameter Markov processes, branching processes, birth and death processes, queuing processes.
3 lects.; one term
Prerequisite: Statistics 2D03 or 2D04, and one of Mathematics 2A05, 2A06, 2G03.

STATS 3X03* ENGINEERING MATHEMATICS IV
Further topics of interest for electrical engineering, emphasizing probability theory.
3 lects.; one term
Prerequisite: Mathematics 2P04 and 2Q04.

STATS 3Y03 MULTIPLE REGRESSION AND NON-PARAMETRIC METHODS
Multiple linear regression model, tests on coefficients, interpretation and applications; autoregression models and time series; nonparametric tests such as goodness-of-fit, Wilcoxon tests and others.
3 lects.; one term
Prerequisite: One of Statistics 3M03, 3N03, 3X03, Mathematics 3J04, 3V06, and registration in an Engineering and Management programme; or permission of the instructor. Not open to students with credit in Statistics 4R03.

STATS 4H03 OPERATIONS RESEARCH
Network models and algorithms, dynamic models, queuing models and other topics.
3 lects.; one term
Prerequisite: Mathematics 3R03, and Statistics 2D03 or 2D04.

STATS 4K03 STATISTICAL DECISION THEORY
Decision theory and applications; Bayes, admissible and minimax rules; multiple decision problems.
3 lects.; one term
Prerequisite: Statistics 3D06.

STATS 4M03 MULTIVARIATE ANALYSIS
Multivariate distributions: Normal, Wishart, T^2 and others; regression, correlation, factor analysis, general linear hypothesis.
3 lects.; one term
Prerequisite: Statistics 3D06, and one of Mathematics 2B04, 2B06, 2J06.

STATS 4R03* REGRESSION ANALYSIS
Linear and non-linear models; least squares theory; analysis of residuals; stepwise regression; weighted least squares; prediction and calibration; selected topics in regression.
3 lects.; one term
Prerequisite: Statistics 3D06. Not open to students who are registered in or have credit in Statistics 3Y03.

STATS 4T03 DESIGN OF EXPERIMENTS
Analysis of variance and covariance; linear models; randomised block designs; Latin squares; factorial experiments. Emphasis on applications.
3 lects.; one term
Prerequisite: Statistics 3D06; or permission of the instructor.

STATS 4U03* NONPARAMETRIC METHODS IN STATISTICS
Rank tests and non-parametric methods; rank correlation; comparisons with parametric methods.
3 lects.; one term
Prerequisite: Statistics 3D06; or permission of the instructor.

STATS 4Z03 INDUSTRIAL STATISTICS
Topics selected from sequential methods, quality control, reliability theory.
3 lects.; one term
Prerequisite: Statistics 3D06.

For **Graduate Courses** see *Calendar of School of Graduate Studies.*

Mechanical Engineering

Faculty as of January 15, 1989

D.S. Weaver/*Chairman*

Professors Emeriti

John H.T. Wade/M.A.Sc., Ph.D. *(Toronto)*, P.Eng.
James N. Siddall/B.E. *(Saskatchewan)*, S.M. *(M.I.T.)*, P.Eng.

Professors

Mohammed A. Dokainish/B.Sc. *(Cairo)*, M.A.Sc., Ph.D. *(Toronto)*, P.Eng.
Hoda A. ElMaraghy/B.Sc. *(Cairo)*, M.Eng., Ph.D. *(McMaster)*, P.Eng.
Ross L. Judd/B.E.Sc. *(Western)*, M.Eng. *(McMaster)*, Ph.D. *(Michigan)*, P.Eng.
Brian Latto/B.Sc. *(London)*, Ph.D. *(Glasgow)*, P.Eng., C.Eng.
W. Roy Newcombe/B.Sc. *(Mount Allison)*, M.E. *(Nova Scotia Tech.)*, P.Eng.
George F. Round/B.Sc., Ph.D., D.Sc. *(Birmingham)*, F.C.I.C., P.Eng.
Robert Sowerby/B.Sc., A.C.G.I. *(London)*, M.Sc., Ph.D., D.Sc. *(Manchester)*, P.Eng.
David S. Weaver/M.A.Sc. *(Toronto)*, Ph.D. *(Waterloo)*, P.Eng.

Associate Professors

Mohammed Elbestawi/B.Sc. *(Alexandria)*, M.Eng., Ph.D. *(McMaster)*, P.Eng.
Mamdouh Shoukri/B.Sc. *(Cairo)*, M.Eng., Ph.D. *(McMaster)*, P.Eng.
Mateusz P. Sklad/M.Sc., Ph.D. *(Warsaw)*.

Assistant Professors

S. Eren Semercigil/B.Sc. *(Ankara)*, M.Sc., Ph.D. *(Manitoba)*
Vincent M. Sowa/B.Sc. *(Illinois)*, M.A. *(Purdue)*, Ph.D. *(Waterloo)*/Part-time

Lecturer

Robert C. Hudspith/B.Eng., M.Eng. *(McMaster)*, P.Eng.

MECHANICAL ENGINEERING

Department Note:
Enrolment in Mechanical Engineering courses by students in programmes other than those administered by the Department may be limited.

MANUFACTURING ENGINEERING

MANUFACT 2C03 ENGINEERING DESIGN II
One to three projects in small teams involving modelling, analysis, synthesis and computing, with emphasis on analysis. Individual reports are required with complete assembly and detail drawings.
2 lects., 1 lab. (3) alternating weeks and 1 lab. (3) every week; second term
Prerequisite: Engineering 1C04 and 1D03 or 1D04, and credit or registration in Engineering 2P04.

MANUFACT 3M03 MANUFACTURING LABORATORY
Laboratory exercises in metalworking practices, measurements and solid mechanics.
2 labs. (4.5); both terms
Prerequisite: Registration in Manufacturing Engineering.

MANUFACT 4A03 COMPUTER AIDED MANUFACTURING
Manufacturing systems. Parts coding and classification, group technology. Computerized process planning. Design for manufacturability. Assembly. Robotics and sensors. Flexible Manufacturing Systems. Management and organization of CAD/CAM/CIM systems. Standards and protocols. Economic and social effects of automation.
3 lects.; second term
Prerequisite: Registration in 3rd or 4th year of either Mechanical or Manufacturing Engineering; or permission of the Department.

MANUFACT 4M04 PROJECT
A major project in the area of manufacturing engineering. It may be of a design or experimental nature.
1 lab. (3), first term, 3 labs. (3); second term
Prerequisite: Registration in Level IV of Manufacturing Engineering.

MANUFACT 4P02 MANUFACTURING LABORATORY
Laboratory exercises in metalworking practices, solid mechanics and controls.
1 lab. (3); both terms
Prerequisite: Registration in Level III or IV Manufacturing Engineering.

MECHANICAL ENGINEERING

MECH ENG 2A03 KINEMATICS OF MECHANISMS
Computations and projects in mechanical engineering. Introduction to the design of mechanisms. Analysis and synthesis of cams, gears and planar mechanisms. Force analysis of machine members.
2 lects., 1 lab. (3); first term, 1 lab. (3); second term
Prerequisite: Mathematics 1H05, 1N06, Physics 1D03.

MECH ENG 2B03 MECHANICAL ENGINEERING MEASUREMENTS
Introduction to the theory and practice of engineering measuring techniques. Theory of measurements, precision shop measurements and optical tooling; measurements of pressure, flow, temperature and power; combustion analysis and gas analysis, measurement of strain and force; elementary statistical analysis.
1 lect., 1 lab. (3), first term, 1 lab. (3); second term
Prerequisite: Mathematics 1H05, Physics 1D03.

MECH ENG 2C03 ENGINEERING DESIGN II
One to three projects in small teams involving modelling, analysis, synthesis and computing, with emphasis on analysis. Individual reports are required with complete assembly and detail drawings.
2 lects., 1 lab. (3) alternating weeks and 1 lab. (3) every week; second term
Prerequisite: Engineering 1C04 and 1D03 or 1D04, and credit or registration in Engineering 2P04.

MECH ENG 3A03 ENGINEERING MECHANICS
Singularity functions, generalized Hooke's law; shear stress, shear flow in beams; shear centre. Biaxial and unsymmetrical bending analysis of indeterminate beams and frames using energy methods; impact loads. Buckling of compression members.
3 lects.; second term
Prerequisite: Engineering 2P04.

MECH ENG 3C03 MANUFACTURING ENGINEERING
A general introduction, encompassing the wide field of activities from iron and steel making through casting, rolling, forging, to cold forming, metal cutting, welding, bonding, electrical machining, surface treatment, mechanical handling, assembly, cleaning, packaging.
3 lects.; first term
Prerequisite: Registration in a programme in Manufacturing Engineering or Mechanical Engineering.

MECH ENG 3D03 MECHANICAL ENGINEERING THERMODYNAMICS
The thermodynamic laws, as developed in Engineering 2W04, are re-examined. Advanced engineering thermodynamic processes, psychometry, introduction to direct energy conversion and chemical equilibrium, with emphasis on combustion.
3 lects.; second term
Prerequisite: Engineering 2W04.

MECH ENG 3E04 ENGINEERING DESIGN III
Introduction to elements of mechanical analysis. Static and dynamic analysis of machine elements, members and mechanical systems. The laboratory consists of problems and case studies.
3 lects., 1 lab. (3); second term
Prerequisite: Engineering 2P04, 2Q04, and credit or registration in Mechanical Engineering 3A03.

MECH ENG 3M02 COMPOSITE LABORATORY
Laboratory exercises in fluid mechanics, thermodynamics and solid mechanics.
1 lab. (3); both terms
Prerequisite: Registration in Mechanical Engineering or Mechanical Engineering and Management.

MECH ENG 3O04 FLUID MECHANICS
Fluid properties and statics are introduced. Basic equations of continuity, energy and momentum for internal and external flows are discussed. Similitude, dimensional analysis and compressible and inviscid flows.
3 lects., 2 tuts.; first term
Prerequisite: Mathematics 2M06, or 2P04 and 2Q04.

MECH ENG 3R03 HEAT TRANSFER
Application of the laws of conduction, convection and radiation to problems in heat transfer. Steady and transient conduction in solids. Laminar and turbulent convection. Radiation heat transfer processes.
3 lects.; second term
Prerequisite: Mathematics 2M06, Engineering 2W04, and credit or registration in Mechanical Engineering 3O04.

MECH ENG 4A03 ADVANCED STRENGTH OF MATERIALS
Advanced analysis of three-dimensional elastic-plastic deformation and structural failure based on continum mechanics. Stress and strain tensors. Failure theories. Numerical techniques.
2 lects., 1 tut.; second term
Prerequisite: Mechanical Engineering 3A03.

MECH ENG 4C03 INDUSTRIAL ENGINEERING
Technical and economic considerations in organizing and planning the production process. Characteristics of job, batch and mass manufacturing systems. Plant layout, work standards and work measurements, means of increasing productivity. Operations research. Concepts and methods in inventory control and statistical quality control.
3 lects.; first term
Prerequisite: Mathematics 3V06.

MECH ENG 4D03 MANUFACTURING PROCESSES (METAL REMOVAL)
Fundamentals of metal removing processes. Characteristics of the various types of operations. Optimizing working conditions for best economy, best precision and surface quality. Characteristics of corresponding production equipment. Accuracy of machine tools, stability, life, reliability. Numerical control and adaptive control of machine tools.
3 lects.; second term
Prerequisite: Mechanical Engineering 3C03.

MECH ENG 4F03 ENGINEERING ACOUSTICS
Propagation of sound: 'near' and 'far' fields, the diffuse field, reverberation time and transmission loss. Generation of noise by fluid flow, vehicular traffic and industrial machinery. Muffler and barrier design. Measurement techniques and noise analysis. Laboratory demonstrations.
3 lects.; first term
Prerequisite: Mechanical Engineering 3D03, 3E04 and 3O04.
Offered in alternate years.

MECH ENG 4G03 MECHANICAL ENGINEERING DESIGN
Engineering design, sythesis and analysis. Design for manufacturability and quality. Analytical techniques e.g. design optimization and probabilistic design. Advanced engineering design tools.
2 lects., 1 tut. (2); first term
Prerequisite: Mechanical Engineering 3E04.

MECH ENG 4L03 INDUSTRIAL DESIGN
Introduction for engineering students to the techniques of industrial design, case studies and introduction to illustration techniques.
3 lects.; second term
Prerequisite: Mechanical Engineering 2C03, 3E04.

MECH ENG 4M04 PROJECT
A major project related to any option or branch of engineering. It may be of a design or experimental nature.
1 lab. (3), first term; 3 labs. (3); second term
Prerequisite: Registration in Level IV Mechanical Engineering, or in Level V Mechanical Engineering and Management.

MECH ENG 4P02 COMPOSITE LABORATORY
Laboratory exercises in vibrations, transients, machine structures, controls, heat transfer, gas dynamics, fluid mechanics and thermodynamics.
1 lab. (3); both terms
Prerequisite: Mechanical Engineering 3M02, and registration in Mechanical Engineering or Mechanical Engineering and Management.

MECH ENG 4Q03 MECHANICAL VIBRATIONS
Transient and steady state vibration of single- and multi-degree of freedom systems. Dynamic vibration absorber. Vibrations of continuous beams. Balancing and critical speeds of shafts.
2 lects., 1 lect./tut.; first term
Prerequisite: Mathematics 2M06, 3V06, Engineering 2Q04, Mechanical Engineering 3A03.

MECH ENG 4R03 CONTROL SYSTEMS
Control systems in a design context with emphasis on digital computer control techniques. Continuous linear systems with analog control, discrete time systems, digital control and the use of microcomputers.
3 lects.; first term
Prerequisite: Mathematics 3V06.

MECH ENG 4S03 FLUID MECHANICS
A sequel to Mechanical Engineering 3O04. Laminar and turbulent flows, boundary layers, unsteady flows, turbomachinery.
2 lects., 1 lect./tut.; first term
Prerequisite: Mechanical Engineering 3O04.

MECH ENG 4T03 FINITE ELEMENT APPLICATIONS
The finite element method and its application to mechanical systems including static and dynamic analysis.
3 lects.; second term
Prerequisite: Credit or registration in Mechanical Engineering 4Q03.

MECH ENG 4U03 ADVANCED THERMODYNAMICS
An advanced approach to material covered in Mechanical Engineering 3D03, with emphasis on practical aspects of energy conversion and conservation, optimization of thermodynamic systems and the thermodynamics of working fluids. Direct energy conversion and energy collection systems.
3 lects.; first term
Prerequisite: Mechanical Engineering 3D03.

MECH ENG 4V03 THERMO-FLUIDS SYSTEMS DESIGN AND ANALYSIS
The analysis and synthesis of realistic thermo-fluid devices and systems, including choice of failure modes and engineering modeling of performance. Emphasis is on applications.
3 lects.; second term
Prerequisite: Mechanical Engineering 3R03, 3D03, and credit or registration in Mechanical Engineering 4S03.

MECH ENG 4W03 AEROTHERMODYNAMICS
Aerodynamics and thermodynamics of compressible flow including wave propagation, shock formation and the effect of friction and heat transfer in internal flow. Real gas flow including the flow in nozzles, diffusers, ejectors and curved passages. Two-phase compressible flow effects.
3 lects.; one term
Prerequisite: Engineering 2W04 and Mechanical Engineering 3O04 or Engineering Physics 3O03.

MECH ENG 4X03 MATERIAL PROPERTIES IN DESIGN
Selection of materials. Canadian standards for structural steel design and internationally accepted material designations; the effects of heat treatment, surface treatment, welding, etc., designing against various modes of failure, including fatigue, stress corrosion cracking, embrittlement and wear.
3 lects.; second term
Prerequisite: Engineering 2O03, Mechanical Engineering 3A03.

MECH ENG 4Y03 ADVANCED KINEMATICS OF MACHINES
Additional topics on the analysis of mechanisms. Major emphasis on the design and methods of synthesis of mechanisms to perform specific motion tasks.
3 lects.; second term
Prerequisite: Engineering 2Q04, Mechanical Engineering 2A03.

MECH ENG 4Z03 COMPUTER AIDED DESIGN
Computer Aided Design (CAD) and Engineering, hardware, software and programming languages. 2-D computer modelling and drafting. Computer graphics and 3-D modelling. Design by features and Expert task planning. Intelligent CAD. Applications of CAD in mechanical engineering.
2 lects., 1 lab. (3); first term
Prerequisite: Registration in Level IV Manufacturing Engineering or Mechanical Engineering or permission of the instructor.

ENGINEER 4J03 METAL FORMING
Offered jointly by the Departments of Mechanical Engineering and Materials Science and Engineering. See *Engineering (General)* for course description.

For **Graduate courses**, see the *Calendar of the School of Graduate Studies.*

Modern Languages

The Department of Modern Languages offers *courses and Combined Honours programmes* in Comparative Literature, German, Italian, Russian, and Hispanic Studies; *Single Honours programmes*, in Comparative Literature, and in Modern Languages and Linguistics; and *courses* in Chinese, Comparative Literature, Croatian, Japanese, Linguistics, Polish and Serbo-Croatian.

Course descriptions are provided under the separate subject headings in the alphabetical listings in the *Course Listings* section of this Calendar.

Programme descriptions are in the *Faculty of Humanities, Modern Languages* section in this Calendar.

Faculty as of January 15, 1989

J.B. Lawson/Chairman

Professors Emeriti

Karl Denner/M.A. *(Kentucky)*, Ph.D. *(Johns Hopkins)*, (German)
Louis J. Shein/B.A. *(Dubuque)*, M.A., Ph.D. *(Toronto)*, D.D. *Honoris Causa (Knox College, Toronto)* (Russian)

Professors

Antonio G. Alessio/D.Litt. *(Genoa)* (Italian)
Samuel D. Cioran/B.A. *(McMaster)*, Ph.D. *(Toronto)* (Russian)
Stelio Cro/L. en L. *(Buenos Aires)*, Dott. Ling. e Lett. *(Venice)* (Italian)
Walter Smyrniw/B.A. *(McMaster)*, M.A., Ph.D. *(Toronto)* (Russian)
Gerhart Teuscher/Dipl.-Uebersetzer *(Mainz-Germersheim)*, M.A. *(Toronto)*, Ph.D. *(State University of New York, Buffalo)* (German)
George Thomas/B.A., Ph.D. *(London)* (Russian)

Associate Professors

John D. Browning/B.A., M.Phil. *(London)*, Ph.D. *(Essex)* (Hispanic Studies)
Gerald Chapple/B.A. *(McMaster)*, A.M., Ph.D. *(Harvard)* (German)
Gabriele Erasmi/B.A. *(Yale)*, M.A., Ph.D. *(Minnesota)* (Italian)
Nina S. Kolesnikoff/M.A. *(Moscow State)*, Ph.D. *(Alberta)* (Russian)
James B. Lawson/B.A. *(New York State College for Teachers, Albany)*, M.A. *(Johns Hopkins)* (German)
Pilar Martinez/B.A., M.S., Chem. *(Madrid)*, M.A. (Middlebury), Ph.D. *(Madrid)* (Hispanic Studies)
Fiorigio Minelli/B.A., M.A. *(Western)*, Ph.D. *(Brown)* (Hispanic Studies)
Hans H. Schulte/Assessor *(Munich)*, Dr. phil. *(Augsburg)* (German)
Robert L. Van Dusen/B.A. *(Harvard)*, M.A., Ph.D. *(Texas)* (German)
Fritz T. Widmaier/B.A. *(Waterloo)*, A.M., Ph.D. *(Southern California)* (German)

Assistant Professors

Vittorina Cecchetto/B.A., M.A., Ph.D. *(Toronto)* (Italian)
Maria del C. Cerezo/B.A. *(Puerto Rico)*, M.A. *(McGill)*, Ph.D. *(Toronto)* (Hispanic Studies)
L. Diane Dyer/B.A., M.A., B.L.S., Phil. M. *(Toronto)* (Italian)
Maria M. Stroińska/M.A. *(Warsaw)*, Ph.D *(Edinburgh)* (German)

Sessional Assistant Professor

Rosangela Mazzuca/B.A., M.A., Ph.D. *(Toronto)* (Italian)

Sessional Lecturer

Yoichi Haruta (Japanese)

Part-time Lecturer

May Zhai (Chinese)

Metallurgy

(See *Materials Science and Engineering, Metallurgy*)

Molecular Biology

These courses are administered within the Faculty of Science, jointly by the Departments of Biochemistry, Biology and Pathology, through a Committee of Instruction, and also draw on the McMaster Institute for Molecular Biology and Biotechnology. Information and counselling may be obtained from the Programme Co-ordinator, Dr. S.T. Bayley, in the Department of Biology.

MOL BIO 3A06 LABORATORY IN MOLECULAR BIOLOGY
Part of this course is common with Biochemistry 3L6. The remainder consists of basic experiments in molecular biology and microbial genetics.
2 labs.; two terms
Prerequisite: Credit or registration in one of Biochemistry 3A06, 3B03, 3G06, and registration in Honours Molecular Biology and Biotechnology; or permission of the instructor.

MOL BIO 4A03 BIOTECHNOLOGY AND GENETIC ENGINEERING LABORATORY
Experiments may involve cloning, engineered mutagenesis, DNA sequencing, expression of cloned genes and fermentation.
2 labs. (4); one term
Prerequisite: One of Biochemistry 3A06, 3C03, 3G06 and one of Biochemistry 3L03 or 3L06 and registration in Honours Molecular Biology and Biotechnology.
Same as Biochemistry 4G03.
Enrolment is limited

MOL BIO 4B03 BIOTECHNOLOGY AND GENETIC ENGINEERING
Theory, methods and applications in genetic engineering and biotechnology with emphasis on recombinant DNA, hybridomas, engineered organisms and fermentation processes.
3 lects.; one term
Prerequisite: One of Biochemistry 3A06, 3C03, 3G06.
Same as Biochemistry 4D03.

MOL BIO 4C03 GENE EXPRESSION
An advanced course covering molecular aspects of gene expression in eukaryotes: DNA replication, control of transcription, RNA processing and transport, translation, protein processing and targeting.
3 lects.; one term
Prerequisite: One of Biochemistry 3A06, 3C03, 3G06.
Same as Biochemistry 4E03 and Biology 4N03.

MOL BIO 4D03 MOLECULAR ASPECTS OF EUKARYOTIC CHROMOSOMES
Chromatin structure, repeated DNA sequences, concerted evolution of gene families, telomeres, centromeres, gene transfer, oncogenes, transposable elements.
3 lects.; one term
Prerequisite: One of Biochemistry 3A06, 3C03, 3G06, and Biology 3O03.
Same as Biochemistry 4F03 and Biology 4M03.

MOL BIO 4E03 REPLICATION AND RECOMBINATION
Replication, recombination, repair and mutagenesis of DNA.
3 lects.; one term
Prerequisite: One of Biochemistry 3A06, 3C03, 3G06, and Biology 3O03.
Same as Biochemistry 4H03 and Biology 4MM3.

MOL BIO 4F03 MOLECULAR ASPECTS OF DEVELOPMENT
Topics include genetic and non-genetic determinants of early embryonic development, cell determination and differentiation.
3 lects.; one term
Prerequisite: One of Biochemistry 3A06, 3C03, 3G06, and Biology 3N06.
Not offered in 1989-90.

MOL BIO 4G03 PLANT MOLECULAR BIOLOGY
Molecular aspects of special features of plant cells and their organelles, cell growth, regeneration and development, protoplast fusion, plant viruses and host-vector systems.
3 lects.; one term
Prerequisite: One of Biochemistry 3A06, 3C03, 3G06, and Biology 2D03, and registration in or completion of Biology 4B03 or 4H03.
Not offered in 1989-90.

Music

Faculty as of January 15, 1989

Hugh Hartwell/*Chairman*

Professors

Marta Hidy/Dipl. Perf. (*Budapest*), F.R.H.C.M. (*Hon.*)
Alan Walker/B.Mus., D.Mus. (*Durham*), A.R.C.M., L.G.S.M., F.G.S.M. (*Hon.*), F.R.S.C.
William Wallace/B.Mus., Ph.D. (*Utah*)

Associate Professors

Frederick Hall/ Assoc. Dipl., B.Mus. (*McGill*), M.A., Ph.D. (*Toronto*)
Hugh Hartwell/Assoc. Dipl., B.Mus. (*McGill*), A.M., Ph.D. (*Pennsylvania*)
Paul Rapoport/A.B. (*Michigan*), M.Mus., Ph.D. (*Illinois*)
Valerie Tryon/L.R.A.M., F.R.A.M., A.R.C.M./part-time

Assistant Professors

Matthew Airhart/B.A. (*Whitman*), M.M. (*Northwestern*)
James Deaville/B.M., M.M., Ph.D. (*Northwestern*)
Sharyn Hall/A.Mus., B.A., M.A., Ph.D. (*Toronto*)/ (*part-time*)
William Renwick/B.Mus., M.Mus. (*British Columbia*), Ph.D. (*CUNY*), A.A.G.O., F.R.C.C.O.

Lecturers (*part-time*)

Roger Flock
Beverly Hicks/B.Mus. (*McMaster*)
John Packer
Peter Oleskevich/Mus.Bac. (*Toronto*), Dip.Dir. (*Vienna*), A.R.C.T.
Ryan Scott

Instructors (*part-time*)

Cécile Bérard-Dunn/B.Mus. (*Collège Marie de l'Incarnation*), M.M. (*Montréal*)/piano
Lita Classen/B.Mus. (*Ottawa*), M.Mus. (*Vincent d'Indy Montreal*). Dipl. Perf. (*Vienna*)/voice
Marc Donatelle/B.M. (*Northwestern*), M.M. (*Southern California*)/ trombone
Dennis Driscoll/A.R.C.C.O. Dipl./organ
Paula Elliott/B.Mus. (*Oberlin*), M.M. (*New England Conservatory*)/flute
Don Englert/jazz saxophone
Mike Farquharson/jazz double bass
Roger Flock/percussion
David Gerry/B.Mus.Perf. (*Toronto*), A.R.C.T./flute
George Greer/double bass
Paul Grimwood/harpsichord
Gregory B. Irvine/Mus.Bac./tuba
Jamie Jamieson/bassoon
Rudolf Kalup/violin
Mary Kenedi/Lic.Dip., Mus.Bac., Mus.M. (*Toronto*)/piano
Zdenek Konicek/Dipl.Music, M.A. (*Prague*)/cello
Peter McAllister/Mus.Bac. (*Toronto*)/classical guitar/jazz guitar
William Moolenbeek/saxophone
Marie Peebles/B.Mus. (*Indiana*)/viola
Brigham Phillips/jazz band
Stephen Pierre/clarinet
Jeff Reynolds/B.A. (*York*), B.Mus. (*Calgary*), M.Mus. (*Victoria*)/trumpet
Suzanne Shulman/flute
Donald Thompson/string bass
Valerie Tryon/piano
Gladys Whitehead/voice
Dave Young/jazz bass
Alla Zacarelli/piano

Department Notes:

1. The following courses may be taken by undergraduates not in a Music programme, subject to the stated prerequisites: Music 1A06, 1B06, 2A06, 2B03, 2BB3, 3A03, 3AA3, 3B03, 3BB3, 3T03, 3U03, 4B03, 4BB3, 4I03.
2. The following courses may be taken by undergraduates not in a Music programme, with conditions as noted.

   Music 1CC2, 1D02, 1DD2: subject to successful completion of qualifying tests administered by the Department and to enrolment limitations. (Priority is given to students in a Music programme.)

   Music 2B03, 2BB3, 2C03, 2CC3, 2D02, 2DD2, 2H04: subject to the stated course prerequisites and to enrolment limitations. (Priority is given to students in a Music programme.)

   Because of the enrolment limitations, students are urged to complete the qualifying tests as soon as possible.

MUSIC 1A06 INTRODUCTION TO MUSIC
An introductory survey of Western art music from ancient times to the present. The historical development of styles and genres within major music periods. Instruction in elementary theory. No previous musical knowledge required.
3 lects.; two terms
Prerequisite: Open. Not available to students registered in Honours Music.

MUSIC 1B06 HISTORY OF MUSIC (CA. 500-1750)
A survey of medieval, renaissance, and baroque music. Includes consideration of performance practices, and influences of the other arts and of socio-political developments.
3 lects.; two terms
Prerequisite: Registration in a Music programme; or Music 1A06 and permission of the Department.

MUSIC 1CC2 HARMONY
The analysis and writing of functional harmony. Includes study of music by J.S. Bach and others.
1 lect.; two terms
Prerequisite: Registration in a Music programme; or permission of the Department. (See *Department Notes, 2,* above.)

MUSIC 1D02 AURAL TRAINING AND GENERAL MUSICIANSHIP
Sight-singing with instruction in Tonic Sol-Fa. Elementary melodic, harmonic, and rhythmic dictation.
1 lect.; two terms
Prerequisite: Registration in a Music programme; or permission of the Department. (See *Department Notes, 2,* above.)

MUSIC 1DD2 KEYBOARD SKILLS
18th-century harmony applied to the keyboard. (Students with a deficiency in keyboard skills will enrol in a special section.)
1 lect.; two terms
Prerequisite: Registration in a Music programme; or permission of the Department. (See *Department Notes, 2,* above.)

MUSIC 1E04 SOLO PERFORMANCE
The technique and repertoire of any orchestral instrument, the piano, organ, harpsichord, voice, recorder, saxophone, or guitar.
1 half-hour lesson weekly; two terms
Prerequisite: Registration in a Music programme. Not available to students with credit in or registration in Music 1E06.

MUSIC 1E06 SOLO PERFORMANCE
Intensive study of the technique and repertoire of any orchestral instrument, the piano, organ, harpsichord, voice, recorder, saxophone, or guitar.
1 hour lesson weekly; two terms
Prerequisite: Registration in Music I, and permission of the Department. Not available to students with credit in, or registration in, Music 1E04.

MUSIC 1G03 ENSEMBLE PERFORMANCE
McMaster Symphony Orchestra, McMaster University Choir, McMaster Concert Band, McMaster Jazz Band, or any other ensemble approved by the Department.
Prerequisite: Permission of the Department. Successful audition required. Academic credit available only to students registered in a Music programme.

MUSIC 2A06 HISTORY OF MUSIC (CA. 1750 TO THE PRESENT)
A detailed study of musical developments of the Classical, Romantic and Modern periods. Topics include: evolution of the symphony, emergence of comic opera, and piano literature.
3 lects.; two terms
Prerequisite: Music 1A06; or permission of the Department. Not available to students registered in Honours Music.

MUSIC 2B03 HISTORY OF MUSIC (CA. 1750-1880)
A survey of classical and romantic music.
3 lects.; one term
Prerequisite: Music 1B06, and registration in a Music programme; or permission of the Department.

MUSIC 2BB3 HISTORY OF MUSIC (CA.1880 TO THE PRESENT)
A survey of post-romantic and 20th-century music.
3 lects.; one term
Prerequisite: Music 2B03, and registration in a Music programme; or permission of the Department.

MUSIC 2C03 COUNTERPOINT
The analysis and writing of modal counterpoint in the style of the late renaissance. Includes study of music by composers such as Palestrina and Lasso.
2 lects., term one; 1 lect., term two; two terms
Prerequisite: Registration in a Music programme; or permission of the Department. Not available to students with credit in Music 1C02 or 2C02.
(See *Department Notes, 2,* above.)

MUSIC 2CC3 HARMONY
A continuation of Music 1CC2. Chromatic harmony and the completed major-minor system.
1 lect., term one; 2 lects., term two
Prerequisite: Music 1CC2, and registration in a Music programme; or permission of the Department. (See *Department Notes, 2,* above.) Not available to students with credit in Music 2CC2.

MUSIC 2D02 AURAL TRAINING AND GENERAL MUSICIANSHIP
A continuation of Music 1D02.
1 lect.; two terms
Prerequisite: Music 1D02, and registration in a Music programme; or permission of the Department. (See *Department Notes, 2,* above.)

MUSIC 2DD2 KEYBOARD SKILLS
A continuation of Music 1DD2. Includes transposing at sight and score reading.
1 lect.; two terms
Prerequisite: Music 1DD2, and registration in a Music programme; or permission of the Department. (See *Department Notes, 2,* above.)

MUSIC 2E04 SOLO PERFORMANCE
A continuation of Music 1E04.
1 half-hour lesson weekly; two terms
Prerequisite: Music 1E04, and registration in a Music programme. Not available to students with credit in or registration in Music 2E06.

MUSIC 2E06 SOLO PERFORMANCE
Intensive study of the technique and repertoire of any orchestral instrument, the piano, organ, harpsichord, voice, recorder, saxophone, or guitar.
1 hour lesson weekly; two terms
Prerequisite: Music 1E06, registration in a Music programme, and permission of the Department. Not available to students with credit in, or registration in, Music 2E04.

MUSIC 2G03 ENSEMBLE PERFORMANCE
McMaster Symphony Orchestra, McMaster University Choir, McMaster Concert Band, McMaster Jazz Band, or any other ensemble approved by the Department.
Prerequisite: Permission of the Department. Successful audition required. Academic credit available only to students registered in a Music programme.

MUSIC 2H04 ANALYSIS
The traditional forms of music as found in works by composers such as Bach, Mozart, Beethoven, and Brahms.
2 lects.; two terms
Prerequisite: Music 1CC2, and registration in a Music programme; or permission of the Department.

MUSIC 3A03 MUSIC EDUCATION I
A survey of choral techniques and music appreciation, and of the rudiments of music for classroom use.
3 lects.; one term
Prerequisite: Music 1A06 or 2A06; or permission of the Department. Not available to students registered in Honours Music.

MUSIC 3AA3 MUSIC EDUCATION II
A survey of the Kodály and Orff methods of music education.
3 lects.; one term
Prerequisite: Music 3A03, or registration in a Music programme; or permission of the Department.

MUSIC 3B03 TOPICS IN MUSIC HISTORY: EARLY MUSIC (MEDIEVAL TO BAROQUE)
Seminar (2 hrs.); one term
Prerequisite: Music 2B03, and registration in a Music programme, or permission of the Department.
Alternates with Music 3BB3.
Music 3B03 may be repeated, if on a different topic, to a total of 6 units.
Not offered in 1989-90.

MUSIC 3BB3 TOPICS IN MUSIC HISTORY: MUSIC OF THE ROMANTIC ERA
1989-90: The Symphonic Poems of Franz Liszt
Seminar (2 hrs.); one term
Prerequisite: Music 2B03, and registration in a Music programme; or permission of the Department.
Alternates with Music 3B03.
Music 3BB3 may be repeated, if on a different topic, to a total of 6 units.

MUSIC 3C04 HARMONY AND COUNTERPOINT
Advanced studies in baroque music. Invention and fugue.
2 lects.; two terms
Prerequisite: Music 2C02 or 2C03, and 2CC2 or 2CC3, and registration in a Music programme.

MUSIC 3E04 SOLO PERFORMANCE
A continuation of Music 2E04.
1 half-hour lesson weekly; two terms
Prerequisite: Music 2E04, and registration in a Music programme. Not available to students with credit in or registration in Music 3E06.

MUSIC 3E06 SOLO PERFORMANCE
Intensive study of the technique and repertoire of any orchestral instrument, the piano, organ, harpsichord, voice, recorder, saxophone, or guitar.
1 hour lesson weekly; two terms
Prerequisite: Music 2E06, and registration in a Music programme. Not available to students with credit in, or registration in, Music 3E04.

MUSIC 3G03 ENSEMBLE PERFORMANCE
McMaster Symphony Orchestra, McMaster University Choir, McMaster Concert Band, McMaster Jazz Band, or any other ensemble approved by the Department.
Prerequisite: Permission of the Department. Successful audition required. Academic credit available only to students registered in a Music programme.

MUSIC 3H04 ANALYSIS
Techniques of analysis applied to selected works of the 20th century.
2 lects.; two terms
Prerequisite: Music 2BB3, 2H04, and either 2CC2 or 2CC3, and registration in a Music programme.

MUSIC 3J04 ORCHESTRATION
A study of the instruments of the orchestra. The scoring of music for symphony orchestra and for concert band.
2 lects.; two terms
Prerequisite: Music 2DD2, and either 2CC2 or 2CC3, and registration in a Music programme.

MUSIC 3K03 BRASS METHODS
A study of the basic techniques of playing brass instruments. Brass literature for various educational levels. No previous study of brass required.
1 lect., 1 lab.; two terms
Prerequisite: Registration in a Music programme.

MUSIC 3L03 WOODWIND METHODS
A study of the basic techniques of playing woodwind instruments. Woodwind literature for various educational levels. No previous study of woodwinds required.
1 lect., 1 lab.; two terms
Prerequisite: Registration in a Music programme.

MUSIC 3M04 STRING METHODS
A study of the basic techniques of playing string instruments. String literature for various educational levels. No previous study of strings required. Each student will concentrate on one instrument and gain a working knowledge of the others.
2 lects.; two terms
Prerequisite: Registration in a Music programme.

MUSIC 3N03 VOCAL METHODS
A study of the basic techniques of singing. The organization, conducting, and rehearsing of a choir. Choral literature for various educational levels. No previous study of voice required.
1 lect.; two terms
Prerequisite: Registration in a Music programme.

MUSIC 3O03 CONDUCTING
Fundamental conducting techniques applied to works selected from the standard repertoire.
2 lects., term one; 1 lect., term two
Prerequisite: Music 1CC2, and registration in a Music programme.

MUSIC 3R03 RESEARCH METHODS AND BIBLIOGRAPHY
An examination of the major reference and bibliographic sources. Historical, analytical, and critical methods of research.
2 lects.; one term
Prerequisite: Music 2BB3, and registration in a Music programme.

MUSIC 3T03 CANADIAN MUSIC
An historical survey of music in Canada, in the context of social and political developments, from ca. 1600 to the present.
2 lects.; one term
Prerequisite: Music 1A06 or completion of 18 units of Music including Music 1B06; or permission of the Department.
Offered in alternate years.

MUSIC 3U03 JAZZ
An historical survey of jazz, focusing on selected performers and arrangers.
2 lects.; one term
Prerequisite: Music 1A06 or completion of 18 units of Music including Music 1CC2; or permission of the Department.
Offered in alternate years.

MUSIC 3V03 MUSIC EDUCATION SEMINAR
A study of the philosophy of music education in the secondary schools. Curriculum organization and practical aspects of ensemble management also will be discussed.
Seminar (2 hrs.); one term
Prerequisite: Registration in a Music programme.

MUSIC 4B03 TOPICS IN MUSIC HISTORY: MUSIC OF THE CLASSICAL ERA
Seminar (2 hrs.); one term
Prerequisite: Music 2B03, and registration in a Music programme; or permission of the Department.
Alternates with Music 4BB3.
Music 4B03 may be repeated, if on a different topic, to a total of 6 units.
Not offered in 1989-90.

MUSIC 4BB3 TOPICS IN MUSIC HISTORY: MUSIC OF THE 20TH CENTURY
1989-90: Music Since 1945
Seminar (2 hrs.); one term
Prerequisite: Music 2BB3, and registration in a Music programme; or permission of the Department.
Alternates with Music 4B03.
Music 4BB3 may be repeated, if on a different topic, to a total of 6 units.

MUSIC 4C04 HARMONY AND COUNTERPOINT
Advanced studies in classical and romantic music. Variations, sonata, and character pieces.
2 lects.; two terms
Prerequisite: Music 3C04, and registration in a Music programme.

MUSIC 4E04 SOLO PERFORMANCE
A continuation of Music 3E04.
1 half-hour lesson weekly; two terms
Prerequisite: Music 3E04, and registration in a Music programme. Not available to students with credit in or registration in Music 4E06.

MUSIC 4E06 SOLO PERFORMANCE
Intensive study of the technique and repertoire of any orchestral instrument, the piano, organ, harpsichord, voice, recorder, saxophone, or guitar.
1 hour lesson weekly; two terms
Prerequisite: Music 3E06, and registration in a music programme. Not available to students with credit in, or registration in, Music 4E04.

MUSIC 4G03 ENSEMBLE PERFORMANCE
McMaster Symphony Orchestra, McMaster University Choir, McMaster Concert Band, McMaster Jazz Band, or any other ensemble approved by the Department.
Prerequisite: Permission of the Department. Successful audition required. Academic credit available only to students registered in a Music programme.

MUSIC 4H03 ANALYSIS
Advanced studies in analysis.
Seminar (2 hrs.); one term
Prerequisite: Music 2BB3, 2H04, and either 2CC2 or 2CC3, and registration in a Music programme.
Offered in alternate years.

MUSIC 4I03 AESTHETICS AND CRITICISM
Philosophies of music. A discussion of major theories from the ancient Greeks to the present.
Seminar (2 hrs.); one term
Prerequisite: Music 2A06 or 2BB3, and registration in a Music programme; or permission of the Department.
Offered in alternate years.

MUSIC 4K03 BRASS METHODS
A continuation of Music 3K03.
1 lect., 1 lab.; two terms
Prerequisite: Music 3K03, and registration in a Music programme.

MUSIC 4L03 WOODWIND METHODS
A continuation of Music 3L03.
1 lect., 1 lab.; two terms
Prerequisite: Music 3L03, and registration in a Music programme.

MUSIC 4M04 STRING METHODS
A continuation of Music 3M04.
2 lects.; two terms
Prerequisite: Music 3M04, and registration in a Music programme.

MUSIC 4N03 VOCAL METHODS
A continuation of Music 3N03.
1 lect.; two terms
Prerequisite: Music 3N03, and registration in a Music programme.

MUSIC 4O03 CONDUCTING
A continuation of Music 3O03.
2 lects., term one; 1 lect., term two
Prerequisite: Music 3O03, and registration in a Music programme.

MUSIC 4P03 PERCUSSION METHODS
A study of the basic techniques of playing percussion instruments. Percussion literature for various educational levels. No previous study of percussion required.
2 lects.; one term
Prerequisite: Registration in a Music programme.

MUSIC 4S03 SPECIAL STUDIES
Advanced supervised study in any area offered and approved by the Department.
Times to be arranged between the student and instructor; one term
Prerequisite: Permission of the Department, and registration in an Honours Music programme.

MUSIC 4Z03 COMPOSITION
The composition of various instrumental or vocal works.
Times to be arranged between the student and instructor; one term
Prerequisite: Registration in a Music programme and permission of the instructor.

MUSIC 4ZZ3 ADVANCED COMPOSITION
The composition of various instrumental or vocal works.
Times to be arranged between the student and instructor; one term
Prerequisite: Music 4Z03, registration in a Music programme, and permission of the instructor.

Nursing

School Notes:

1. This course listing is divided into 3 parts:

   Basic (A) Stream: Those courses taken only by students registered in the B.Sc.N. programme (A) Stream.

   Diploma R.N. (B) Stream: Those courses taken *only* by students registered in the B.Sc.N. programme (B) Stream.

   (A) *and* (B) Stream: Those courses taken by students registered in the B.Sc.N. programme (A) or (B) Stream.

2. Normally, registration in all courses beyond Level I will require satisfactory completion of the prerequisite Nursing courses **with a grade of at least C–.** (See the section *Faculty of Health Sciences, School of Nursing, Academic Regluations* in this Calendar.)
3. Normally, Level II, III, and IV courses are available to Level II, III, and IV B.Sc.N. (A) and (B) Stream students respectively.

BASIC (A) STREAM

NURSING 1F07 INTRODUCTION TO NURSING
An introduction to the study of nursing. The focus is on the health of individuals and the role of the nurse in the maintenance and promotion of health. Understanding of the nursing process and beginning level skills in assessment, communication and interviewing are emphasized.
4 hrs. (clin., lab.); 2 hrs. (lect./problem-based tut.); two terms
Prerequisite: Registration in Level I of the B.Sc.N. Programme (A) Stream.

NURSING 2M05 NURSING CONCEPTS IN HEALTH AND ILLNESS I
Integration of biological, psychological and social sciences and nursing theory are developed through work in problem-based tutorials, in which students apply concepts related to nursing, teaching-learning and communication processes to a variety of patient situations. Through independent study, students apply theoretical knowledge to a chosen clinical topic.
2 1/2 hrs. (lect./problem-based tut.); two terms
Prerequisite: Nursing 1F07. Normally to be taken concurrently with Nursing 2L06.

NURSING 2L06 GUIDED NURSING PRACTICE I
Growth and development of the individual are studied within the context of the family and the community. Concepts basic to nursing are examined as they relate to maturational and situational stress. By using a variety of clinical and laboratory settings, experiences are provided with young adults in the childbearing phase of family development and adults of all ages, some of whom have been hospitalized for surgery. Each student works in hospital and home settings during the year.
8 hrs. (clin. lab. including tuts.); two terms
Prerequisite: Nursing 1F07. Normally taken concurrently with Nursing 2M05.

NURSING 2H04 GUIDED NURSING PRACTICE II
Students utilize knowledge and skills studied in Levels I and II by assessing, planning, implementing, and evaluating the nursing care of patients in one of a variety of clinical settings.
24 hrs. (clin. lab., including tuts.) per week for 4 wks; third term
Prerequisite: Nursing 2L06 and 2M05.

NURSING 3X07 GUIDED NURSING PRACTICE III
Planned and guided practice experiences are provided in a variety of settings (e.g. psychiatric, pediatric and medical-surgical units, physicians offices and community health agencies). Major emphasis is given to the assessment, problem-solving, interpersonal, technical and teaching skills necessary to implement and evaluate nursing care in institutional and ambulatory community settings. Nursing of individuals and families throughout the life-cycle and along the health-illness continuum is stressed.
21 hrs. (clin. lab. including tuts.); 13 weeks
Prerequisite: Nursing 2H04. Normally taken concurrently with Nursing 3S08.

NURSING 3Y07 GUIDED NURSING PRACTICE IV
A continuation of Nursing 3X07.
21 hrs. (clin. lab including tuts.); 13 weeks
Prerequisite: Nursing 3X07. Normally taken concurrently with Nursing 3S08.

NURSING 4J07 GUIDED NURSING PRACTICE V
This course focuses on the application of theory and concepts to clinical practice, including the introduction to the leader/manager role in patient care. Students are individually placed in a variety of health care settings.
24 hrs. (clin. lab./including tut.); 12 weeks
Prerequisite: Nursing 3Y07. Normally to be taken concurrently with Nursing 4E06.

NURSING 4K07 GUIDED NURSING PRACTICE VI
A continuation of Nursing 4J07.
Prerequisite: Nursing 4J07. Normally to be taken concurrently with Nursing 4E06.

DIPLOMA R.N. (B) STREAM

NURSING 3L05 GUIDED NURSING PRACTICE I
Planned and guided practice experiences in primary health care settings. Major emphasis is given to the assessment, problem-solving, interpersonal, ministering and teaching behaviour necessary to implement and evaluate nursing care in ambulatory community settings. Nursing of individuals and families throughout the life cycle and along the health-illness continuum is stressed.
15 hrs. (clin. lab., including tut.); 13 weeks.
Prerequisite: Normally to be taken concurrently with Nursing 3S08.

NURSING 3M05 GUIDED NURSING PRACTICE II
A continuation of Nursing 3L05.
15 hrs. (clin. lab., including tut.); 13 weeks.
Prerequisite: Normally to be taken concurrently with Nursing 3S08.

NURSING 3N08 GUIDED NURSING PRACTICE III
Concentrated planned experience in one setting (normally community health nursing) with a major emphasis on the development of expanded role skills in a reality situation which allows for the development and demonstration of independent decision-making.
24 hrs. (clin. lab.), 4 hrs. (independent study), 3 hrs. (tut.); 6 weeks (normally offered in May - June.)
Prerequisite: Nursing 3L05 and 3M05.

NURSING 4S06 GUIDED NURSING PRACTICE IV
An applied nursing practice course in which the focus is on the integration of theory and concepts in a variety of interdependent health care settings. This course will allow the development of independent decision-making capacity in a selected area of clinical practice.
12 hrs. (clin. lab.), 2 hrs. (tut.); 13 weeks
Prerequisite: Nursing 3N08. Normally to be taken concurrently with Nursing 4E06.

NURSING 4T06 GUIDED NURSING PRACTCE V
A continuation of Nursing 4S06.
12 hrs. (clin. lab.), 2 hrs. (tut.); 13 weeks
Prerequisite: Nursing 4S06. Normally to be taken concurrently with Nursing 4E06.

(A) *and* (B) STREAM

NURSING 3S08 NURSING CONCEPTS IN HEALTH AND ILLNESS II
Models of nursing intervention using a variety of theoretical bases are applied to health care situations through problem-based learning. Recurring themes such as crisis, loss, anxiety, identity, immobility, and pain are studied in a framework related to the promotion of health, prevention of illness, early diagnosis and treatment, rehabilitation, and maintenance.
4 hrs. (lect./problem-based tut.); two terms
Prerequisite: Normally taken concurrently with Nursing 3X07 and 3Y07 (for (A) Stream students), or Nursing 3L05 and 3M05 (for (B) Stream students).

NURSING 4A02 CURRENT TRENDS AND ISSUES IN NURSING
Issues facing the profession, and the implications of current changes in the health field for future nursing practice.
2 lects. every week; one term

NURSING 4E06 CONCEPTS IN HEALTH AND ILLNESS III
A problem based seminar course in which students integrate theories and concepts related to patient care and leadership activities. Student participation includes selecting appropriate clinical situations and related theories for study, and developing a group presentation based on teaching/learning principles.
3 hrs. (lect./seminar presentation) per week; two terms
Prerequisite: Normally taken concurrently with Nursing 4J07 and 4K07 (for (A) Stream students), or Nursing 4S06 and 4T06 (for (B) Stream students).

Peace Studies

While there is no B.A. programme in *Peace Studies*, students wishing to concentrate in this area should be aware of the following courses offered by various departments. Special note should be taken of the introductory course, Social Sciences 2B06. Those desiring further information on specific courses should consult the departmental listings in the Calendar.

Students wishing to pursue *Peace Studies* may obtain further information from Dr. P. Dekar (Divinity College) or Dr. Graeme MacQueen (Religious Studies).

Social Science 2B06	Introduction to the Study of Peace
Social Science 2C03	Genocide and Ethnocide
Social Science 2D03	Peace and Development
Anthropology 2X03	Warfare and Aggression
Anthropology 3T03	Competition and Conflict
Biology 3Q03	Radiation Biology
History 3I03	The International Relations of the European Powers, 1914-1945
History 3II6	The History of Warfare 1865-1945
History 3RR3	War and Society in Twentieth Century Britain
Philosophy 1B06	Philosophy and Society
Philosophy 2G03	Social and Political Issues
Philosophy 3P03	Philosophies of War and Peace
Political Science 2E06	International Politics
Political Science 3AA3	International Politics in the Post War Period
Political Science 3CC3	International Organizations
Political Science 4M06	Issues in International Politics
Religious Studies 1F06	War and the Problem of Meaning
Religious Studies 2H03	Issues in War and Peace
Religious Studies 2L03	Life, Work and Teachings of Mahatma Gandhi
Sociology 3F06	Political Sociology

Pharmacology

These courses are available only to those students registered in Honours Biology and Phamacology. The offering of this programme is contingent upon approval by the Ontario Council on University Affairs and resource approval from the Board-Senate Committee on Academic Planning (BSCAP).

Department Note:
Pharmacology 3A06, 3B06, 4A03, 4AA3, 4C03 and 4D03 will be based on self-directed problem based learning.

PHARMAC 3A06 INTRODUCTION TO PHARMACOLOGY
Receptor theory and classification, receptor response coupling, mechanisms of drug absorption, distribution, metabolism and excretion and their roles in drug selectivity.
1 tut. (1), 1 tut. (2); two terms.
Prerequisite: Registration in the Honours Biology and Pharmacology programme.

PHARMAC 3B03 METHODS IN PHARMACOLOGY
Methods to study effects of drugs in vitro (such as organ baths and ligand-receptor binding) and analysis of pharmacological data.
1 lab (3); one term
Prerequisite: Completion of or registration in Pharmacology 3A06.

PHARMAC 4A03 DRUG AND SIGNAL TRANSMISSION I
Introduction to the effects of drugs on communication by chemical signals in biological systems.
1 tut. (1), 1 tut. (2); one term
Prerequisite: Pharmacology 3A06.

PHARMAC 4AA3 DRUG AND SIGNAL TRANSMISSION II
The continuation of Pharamacology 4A03.
1 tut. (1), 1 tut. (2); one term
Prerequisite: Pharmacology 4A03.

PHARMAC 4B03 DRUGS AND BEHAVIOUR
Behavioural measures to study drug action and the use of drugs to study the organization and physiochemical mechanisms in normal and abnormal behaviour.
3 lects. or 2 lects. and 1 tut.; one term
Prerequisite: Pharmacology 3A06 or Biology 3AA3.

PHARMAC 4C03 PRINCIPLES OF TOXICOLOGY
General principles of toxicology, adverse effects of selected agents on man and other organisms.
1 tut. (1), 1 tut. (2); one term
Prerequisite: Pharmacology 3A06.

PHARMAC 4D03 DRUG DESIGN
Principles of drug design based on drug transport, metabolism and selectivity of action at the target sites with emphasis on quantitative structure-activity relationships.
1 tut. (1), 1 tut. (2); one term.
Prerequisite: Pharmacology 3A06.

PHARMAC 4F09 SENIOR THESIS
A thesis based upon a research project carried out under the direction of a member of the Faculty.
Prerequisite: Pharmacology 3A06.

Philosophy

Faculty as of January 15, 1989

Evan Simpson/*Chairman*

Professors Emeriti

Horace A. Dulmage/B.A., B.D. *(McMaster)*, Ph.D. *(Chicago)*
James H. Noxon/B.A., M.A. *(Queen's)*, Ph.D. *(Edinburgh)*
Frederick W. Waters/B.A., B.D. *(McMaster)*, Ph.D. *(Yale)*

Professors

Nicholas Griffin/B.A. *(Leicester)*, Ph.D. *(Australian National)*
G. B. Madison/B.A. *(St. Joseph's College)*, M.A. *(Marquette)*, Ph.D. *(Paris)*
Albert Shalom/B.A., M.A. *(Cape Town)*, D. de l'U., D. ès L. *(Paris)*
Evan Simpson/A.B. *(Amherst)*, Ph.D. *(Duke)*
John E. Thomas/B.A., B.D. *(McMaster)*, M.A., Ph.D. *(Duke)*

Associate Professors

Samuel Ajzenstat/B.A., M.A. *(Toronto)*, Ph.D. *(Pennsylvania)*
Catherine Beattie/B.A. *(McMaster)*, M.A. *(Guelph)*, Ph.D. *(London)*
Constantine Georgiadis/M.A. *(Warsaw)*, Ph.D. *(London)*
David L. Hitchcock/B.A. *(McMaster)*, Ph.D. *(Claremont)*
Sami M. Najm/A.A. *(Beirut)*, B.A. *(Wesleyan)*, M.A., Ph.D. *(Yale)*
Spiro Panagiotou/B.Sc., M.A. *(Guelph)*, Ph.D. *(St. Andrews)*
Michael Radner/B.A. *(Carleton College, Minn.)*, M.A., Ph.D. *(Minnesota)*

Assistant Professors

Barry G. Allen/B.A., *(Lethbridge)*, M.A., Ph.D. *(Princeton)*
John R.M. Bristol/B.A., M.A., Ph.D. *(Toronto)*/part-time
Mark Vorobej/B.A. *(Carleton)*, M.A., Ph.D. *(Toronto)*
Wilfrid Waluchow/B.A., M.A. *(Western)*, D.Phil. *(Oxford)*

Associate Members

Kenneth M. Blackwell (Russell Archivist, Mills Library), B.A. *(Victoria)*, M.L.S. *(Western)*, M.A. *(McMaster)*, Ph.D. *(Guelph)*
James C. Gaa (Faculty of Business), B.A. *(Michigan State)*, A.M., Ph.D. *(Washington, St. Louis)*, Ph.D. *(Illinois)*

Department Notes:

1. The Department of Philosophy offers two Level I courses, Philosophy 1B06 and Philosophy 1D06, which are designed to introduce the student to the study of the subject. No student may take more than one of these courses.
2. The Department of Philosophy offers courses in four major areas of Philosophy, namely History of Philosophy, Logic, Ethics and Theory of Value, and Theory of Knowledge and Metaphysics. Students are advised to include courses from each of these areas in their programmes.

PHILOS 1B06 PHILOSOPHY AND SOCIETY
An introduction to philosophy, through the social-political thought of two or more of Plato, Hobbes, Mill and Marx, focusing on rival views of human nature and the state, social conflict, inequality and justice.
2 lects., 1 tut.; two terms
Prerequisite: Open, except to students who have credit in, or are registered in, Philosophy 1D06.

PHILOS 1D06 PROBLEMS IN PHILOSOPHY
A critical investigation of philosophical arguments concerning God, politics, morality, human nature, knowledge and art.
2 lects., 1 tut.; two terms
Prerequisite: Open, except to students who have credit in, or are registered in, Philosophy 1B06.

PHILOS 2A06 ANCIENT GREEK PHILOSOPHY
A study of Western philosophical thought from its earliest beginnings to the triumph of Christianity in the Roman Empire, with emphasis on Plato and Aristotle.
3 lects.; two terms
Prerequisite: Open to students in Level II and above.

PHILOS 2B03 INTRODUCTORY LOGIC
Sentential and quantification logics are introduced and applied to arguments in English.
3 lects.; one term
Prerequisite: Open to students in Level II and above.

PHILOS 2C06 DESCARTES TO HUME
A study of 17th- and 18th-Century European and British philosophy, dealing with the major philosophical issues raised by the 17th-Century scientific revolution.
3 lects.; two terms
Prerequisite: Open to students in Level II and above.

PHILOS 2D03 MORAL ISSUES
An introduction to moral philosophy, accenting biomedical ethics. Issues such as abortion, human experimentation, euthanasia, and genetic screening will be investigated in cooperation with members from the Faculty of Health Sciences.
2 lects., 1 tut.; one term
Prerequisite: Open to students in Level II and above.
Same as Religious Studies 2C03.

PHILOS 2F03 PHILOSOPHICAL PSYCHOLOGY
A consideration of such questions as: In what terms might human nature be described? How do intentional and unintentional behaviour differ? How do physical and mental states differ? When is action free? Can intelligence be duplicated artificially?
3 lects.; one term
Prerequisite: Open to students in Level II and above. Not available to students with credit in Philosophy 2F06.

PHILOS 2G03 SOCIAL AND POLITICAL ISSUES
A philosophical examination of some contemporary issues in public policy, such as environmental problems, the question of a just distribution of society's goods and services, and problems of liberty and coercion.
2 lects., 1 tut; one term
Prerequisite: Open to students in Level II and above.

PHILOS 2H03 AESTHETICS
An introduction to some main theories of the nature of art, criticism, and the place of art in life and society.
3 lects.; one term
Prerequisite: One previous course in Philosophy; or permission of the Department.
Same as Art History 2H03.

PHILOS 2M03 SCIENTIFIC METHOD
Theory structure and justification in the sciences compared to reasoning in pseudosciences (e.g. theories of paranormal or 'psi' phenomena).
3 lects.; one term
Prerequisite: Open to students in Level II and above. Not available to students with credit in Philosophy 3S03.

PHILOS 2N03 BUSINESS ETHICS
An analysis of ethical issues arising in contemporary business life. Sample topics include: fair and unfair competition; responsibilities towards employees, society and the environment; honesty and integrity in business; the moral status of corporations.
2 lects., one tut.; one term
Prerequisite: Open to students in Level II and above.

PHILOS 2R03 REASONING
An introduction to important types of reasoning, with emphasis on concepts rather than techniques. Possible topics: arguments, deductive validity, the logical structure of sentences, testing hypotheses, making decisions, reasoning about value questions.
2 lects., 1 tut.; one term
Prerequisite: Open to students in Level II and above. Not available to students with credit for, or registration in, Humanities 1C03 or Arts and Science 1B06.

PHILOS 3A06 FROM KANT TO HEGEL
The philosophies of Kant and Hegel viewed in relation to each other and to other philosophies of the period, such as those of Rousseau or Schelling.
1 lect. (2 1/2 hrs.); two terms
Prerequisite: Philosophy 2C06 and registration in Level III or IV of any programme; or permission of the Department.

PHILOS 3B03 PHILOSOPHIES OF EXISTENCE
An examination of the 19th-century forerunners of contemporary existential philosophy, concentrating principally on the thought of Kierkegaard and Nietzsche.
1 lect. (2 1/2 hrs.); one term
Prerequisite: At least six units of Philosophy, and registration in Level III or IV of any programme; or permission of the Department.

PHILOS 3C03 ADVANCED BIOETHICS
An advanced study of the application of ethical theory to selected problems in health care relating to the problem of the sanctity versus the quality of life.
3 lects.; one term
Prerequisite: Philosophy 2D03 or Religious Studies 2C03 with a grade of at least B, and at least three additional units of Philosophy; or registration in Level III or IV of an Honours programme in Philosophy; or permission of the Department.

PHILSO 3D03 PRAGMATISM
A study of the most distinctive American contribution to philosophy with emphasis on such figures as C.S. Peirce, William James, John Dewey, C.I. Lewis, and Richard Rorty.
3 lects.; one term
Prerequisite: Six units of Philosophy and registration in Level III or IV of any programme; or permission of the Department.
Offered in 1989-90 and in alternate years.

PHILOS 3E03 PLATO
A critical examination of Plato's writings, with reference to selected central philosophical issues.
1 lect., 1 seminar (2 hrs.); one term
Prerequisite: Philosophy 2A06 and registration in Level III or IV of any programme; or permission of the Department.
Offered in alternate years.

PHILOS 3F03 INTERMEDIATE LOGIC
A study of formal languages and their interpretations, including soundness and completeness proofs, and some major results such as Gödel's theorems.
3 lects.; one term
Prerequisite: Philosophy 2B03; or permission of the Department.
Offered in alternate years.

PHILOS 3G03 ETHICS
An introduction to the major types of ethical theory and the problem of their justification.
3 lects.; one term
Prerequisite: At least six units of Philosophy, and registration in Level III or IV of any programme; or permission of the Department.

PHILOS 3H03 PHILOSOPHY OF RELIGION
A discussion of the nature of religious belief and of some arguments for and against the existence of God.
3 lects.; one term
Prerequisite: At least six units of Philosophy, and registration in Level III or IV of any programme; or permission of the Department.

PHILOS 3J03 ARISTOTLE
A systematic study of Aristotle's major doctrines.
1 seminar (2 1/2 hrs.); one term
Prerequisite: Philosophy 2A06 and registration in Level III or IV of any programme; or permission of the Department.
Offered in alternate years.

PHILOS 3K03 PHILOSOPHY OF EDUCATION
An introduction to the philosophy of education and its role in dealing with contemporary educational issues, such as equality of educational opportunity and students' rights.
2 lects., 1 tut.; one term
Prerequisite: At least six units of Philosophy, or permission of the Department.

PHILOS 3M03 PHILOSOPHY OF BIOLOGY
Introduction to philosophical problems arising from Biology: the nature of biological laws and explanations, the presuppositions of taxonomy, the status of sociobiology and evolutionary theory.
2 lects., 1 tut.; one term
Prerequisite: One course in Biology or Philosophy 2M03; or permission of the instructor. Not available to students with credit in Philosophy 2L03.

PHILOS 3N06 POLITICAL PHILOSOPHY
A study of the main political perspectives — conservatism, liberalism, and radicalism — and their ideas of liberty, equality, justice, and revolution.
3 lects.; two terms
Prerequisite: At least six units of Philosophy, and registration in Level III or IV of any programme; or permission of the Department.

PHILOS 3O03 THEORY OF KNOWLEDGE
An examination of the justification of human beliefs and the role of sensory experience in knowledge.
3 lects.; one term
Prerequisite: At least six units of Philosophy, and registration in Level III or IV of any programme; or permission of the Department.

PHILOS 3P03 PHILOSOPHIES OF WAR AND PEACE
A philosophical appraisal of the rationality and morality of the conduct of war and proposals for fostering peace among nations.
3 lects.; one term
Prerequisite: At least six units of Philosophy, and registration in Level III or IV of any programme; or permission of the Department.

PHILOS 3Q03 PHILOSOPHY OF LAW
An investigation of the nature of law and of issues arising within legal systems. These issues include legal reasoning, equality, legal insanity, punishment, and the Charter of Rights and Freedoms.
3 lects.; one term
Prerequisite: At least six units of Philosophy and registration in Level III or IV of any programme; or permission of the Department.

PHILOS 3R03 BERTRAND RUSSELL
An introduction to various aspects of Russell's philosophical thought. Each year two or three topics in his theory of knowledge, metaphysics, philosophy of language and social philosophy will be selected for special attention.
1 lect. (2 hrs.), 1 seminar; one term
Prerequisite: At least six units of Philosophy, and registration in Level III or IV of any programme; or permission of the Department. Philosophy 2B03 is recommended.
Offered in alternate years.

PHILOS 3W03 READING COURSE
A tutorial course in which individual students meet regularly with an instructor on a list of readings outside normally available course offerings. Times and topics are arranged between the students and the instructor.
Prerequisite: Registration in Level III or IV of a programme in Philosophy, with a Cumulative Area Average of at least 7.0 in Philosophy, agreement of the instructor, and permission of the Department. A formal proposal must be submitted to the Philosophy Undergraduate Advisor prior to registration.

PHILOS 4A03 CARTESIANISM
A study of Cartesianism (including the views of Leibniz) as a response to 16th-Century mechanism.
Seminar (2 1/2 hrs.); one term
Prerequisite: Philosophy 2C06 or 2F03 and registration in Level III or IV of any programme; or permission of the Department.
Offered in 1989-90 and in alternate years.

PHILOS 4B03 THEORY OF VALUE
A study of human practices of evaluation in morality, politics, art, religion, and economics.
Seminar (2 1/2 hrs.); one term
Prerequisite: Registration in Level III or IV of a programme in Philosophy; or permission of the Department.
Offered in alternate years.

PHILOS 4D03 TWENTIETH-CENTURY ANALYTIC PHILOSOPHY
A study of some main currents of 20th-century philosophy, including the work of such figures as Wittgenstein, Quine, and Davidson.
Seminar (2 1/2 hrs.); one term
Prerequisite: Registration in Level III or IV of a programme in Philosophy; or permission of the Department.
Offered in 1989-90 and in alternate years.

PHILOS 4E03 EXISTENTIALISM AND PHENOMENOLOGY
A study of selected texts of major existential and phenomenological philosophers in the 20th-century, such as Camus, Heidegger, Jaspers, Marcel.
Seminar (2 1/2 hrs.); one term
Prerequisite: At least six units of Philosophy, and registration in Level III or IV of any programme; or permission of the Department.

PHILOS 4F03 RECENT EUROPEAN PHILOSOPHY
Contemporary trends in European Philosophy as represented by such writers as Derrida, Foucault and Habermas.
Seminar (2 1/2 hrs.); one term

Prerequisite: Registration in Level III or IV of a programme in Philosophy; or permission of the Department.
Offered in alternate years.

PHILOS 4H03 METAPHYSICS
An investigation of metaphysical concepts, such as substance, individuation, identity, essence, quality, process, mind, time and causality. Some contemporary criticisms of metaphysics will be discussed.
Seminar (2 1/2 hrs); one term
Prerequisite: Registration in Level III or IV of a programme in Philosophy; or permission of the Department.

PHILOS 4I03 MEDIEVAL PHILOSOPHY
A discussion of the philosophical doctrines of Augustine, Thomas Aquinas, and William of Occam.
Seminar (2 1/2 hrs.); one term
Prerequisite: Philosophy 2A06 or 3E03 or 3J03 and registration in Level III or IV of any programme; or permission of the Department.
Offered in alternate years.

PHILOS 4L03 LOGICAL THEORY
The course deals with applications of logic within philosophy and philosophical issues within logic. Topics which may be included are modal logics, deontic logics, formal semantics, free logics, many-valued logics, and such concepts as truth, reference, logical form, and bivalence.
3 lects.; one term
Prerequisite: Philosophy 2B03; or permission of the Department.
Offered in alternate years.

PHILOS 4W03 READING COURSE
A tutorial course in which individual students meet regularly with an instructor on a list of readings outside normally available course offerings. Times and topics are arranged between the student and the instructor.
Prerequisite: Registration in Level IV of an Honours programme in Philosophy, agreement of the instructor, and permission of the Department. A formal proposal must be submitted to the Philosophy Undergraduate Advisor prior to registration. (This requirement does not apply to students in a programme combining Philosophy and Biology.) Not available to students with credit in Philosophy 4Z06.

PHILOS 4Z06 THESIS
Reading and research under the supervision of two members of the Department. A major paper is required as well as a formal oral examination.
Prerequisite: Registration in Level IV of any Honours programme in Philosophy, with a Cumulative Area Average of at least 9.0 in Philosophy, and permission of the Department. A formal proposal must be submitted to the Undergraduate Advisor prior to registration. Not available to students with credit in Philosophy 4W03.

Physical Education

Faculty as of January 15, 1989

P. Donnelly/ *Chairman*

Professors Emeriti

Frank J. Hayden/B.A. *(Western)*, M.A., Ph.D. *(Illinois)*
Allan J. Smith/B.S.A., M.Ed. *(Toronto)*, D.Ed. *(SUNY, Buffalo)*

Professor

J. Duncan MacDougall/B.A., B.P.H.E. *(Queen's)*, M.S. *(Oregon)*, Ph.D. *(Wisconsin)*

Associate Professors

Peter Donnelly/Dip.Ed. *(City of Birmingham College)*, B.A. *(Hunter College, N.Y.)*, M.S., Ph.D. *(Massachusetts)*
Digby Elliott/B.Sc., M.Sc., Ph.D. *(Waterloo)*
William H. Fowler/B.A. *(Western)*, M.P.E. *(Springfield)*/Director, School of Physical Education and Athletics
Barbara A. Gowitzke/B.S. *(Boston)*, M.Ed. *(North Carolina)*, Ph.D. *(Wisconsin)*
Raymond B. Johnson/B.A. *(Western)*, M.Ed. *(SUNY, Buffalo)*, Ph.D. *(Temple)*
Mary E. Keyes/B.A., M.A. *(Western)*, Ph.D. *(Ohio State)*
Fredrick A. Moyes/Dip. P.E. *(Jordanhill)*, M.Ed. *(Leicester)*
Digby G. Sale/B.P.H.E. *(Toronto)*, M.A. *(Western)*, Ph.D. *(McMaster)*
Janet L. Starkes/B.A. *(Western)*, M.Sc., Ph.D. *(Waterloo)*

Assistant Professors

Cameron J. Blimkie/ B.A., B.P.E. *(McMaster)*, M.A., Ph.D. *(Western)*
Nicholas Cipriano/B.P.H.e., M.Sc. *(Lakehead)*
Audrey Hicks/B.P.E., M.Sc., Ph.D. *(McMaster)*
Susan E. Inglis/B.P.E., M.A. *(Alberta)*, Ph.D. *(Ohio State)*
Timothy D. Lee/B.H.K., M.A. *(Windsor)*, Ph. D. *(Louisiana State)*
Andrea M. Mann/B.A., B.P.E. *(McMaster)*, M.Sc. *(Dalhousie)*, Ph.D. *(Ohio State)*
Neil McCartney/B.Ed. *(St. Luke's College)*, Ph.D. *(McMaster)*
Cindy Riach/B.A., B.P.H.E., B.Ed., M.Sc. *(Queen's)*, Ph.D. *(Waterloo)*
Philip G. White/B.Sc. *(London)*, Cert.Ed. *(Carnegie)*, M.Sc., Ph.D. *(Waterloo)*

Lecturers

Michael Cain/B.A. *(York)*
John C. Edwards/B.P.E. *(McMaster)*, M.A. *(Western)*
Robert J. Henderson/B.P.E. *(McMaster)*, M.A. *(Alberta)*
Susan J. Lindley/B.Sc. *(Guelph)*, M.Sc. *(McMaster)*
Brian K.V. Maraj/B.P.E. *(McMaster)*, M.A. *(Western)*
Thérèse A. Quigley/B.A. B.Ed. *(Western)*, M.A. *(Alberta)*
David C. Wilson/B.Ed. *(Bristol)*

Instructors

Deborah E. Marinoff/B.Sc. *(York)*
Barry M. Phillips/B.Sc., B.Ed. *(Acadia)*, M.A. *(U.S.S.A.)*
Gaye Stratten/B.P.H.E. *(Toronto)*

Associate Members

Oded Bar-Or/Pediatrics/M.D. *(Hebrew Un., Jerusalem)*
Scott Garner/Medicine/B.Sc. (Med.) *(Manitoba)*, M.D. *(Manitoba)*

School Notes:

1. Not all Physical Education courses listed in this Calendar are taught every year. Students are advised to consult the time-table which is published annually by the Registrar's Office to determine whether a course is offered.
2. With the permission of the instructor, the following courses **may be taken** as electives for B.A. credit by undergraduates **not** in Physical Education 3J03, 3P03, 3Q03, 4E03, 4J03, 4L03, 4M03, 4Q03.

   All other Physical Education courses are **open only** to students registered in the Bachelor of Physical Education programme.
3. **Required Area theory** courses are: Physical Education 1A06, 1B03, 1E03, 1F03, 2A03, 2B03, 2C06, 2D03, 2F03, and Biology 1J03.

   Required Area practicum courses are: PRO2 (Gymnastics), PRO3 (Track), PRO4 (Games), PRO5 (Dance), PRO6 (Fitness). Students must also fulfill the swimming requirement. (See the section *Faculty of Social Sciences, School of Physical Education, Programme Notes*).

   Area Electives: All other Physical Education courses listed or offered.

   Enrolment in some Level III and IV elective courses may be limited and may require a prerequisite or permission from the instructor. Criteria for selection of students into limited enrolment courses are listed in the Level III and IV course descriptions.
4. Registration in all courses marked ★★ listed as selected topics, independent research, individual readings, and honours essays requires written permission of the Department. Registration with appropriate permission must be completed no later than the last day for registration as stated in the Calendar under *Sessional Dates.*

PHYS ED 1A06 HUMAN ANATOMY
Macroscopic and microscopic anatomy, with particular reference to the locomotor, nervous, cardiovascular, respiratory, digestive, endocrine, and urogenital systems.
3 hrs. (lects., labs.); two terms

PHYS ED 1B03 SOCIOLOGY OF SPORT
Critical examination of contemporary issues and problems of sport in Canadian society.
3 hrs. (lects. and discussion); one term

PHYS ED 1E03 MOTOR DEVELOPMENT
Physical growth patterns and the development of perceptual-motor abilities. Age-appropriate motor behaviour, from infancy to old age, is investigated.
3 hrs. (lects., labs.); one term

PHYS ED 1F03 KINESIOLOGY I
An introduction to basic mechanical principles and concepts as applied to physical activity.
3 hrs. (lects., labs.); one term

PHYS ED 2A03 KINESIOLOGY II
Motor skills analyzed in terms of elementary mechanical principles.
1 lect., 2 labs.; one term

PHYS ED 2B03 PSYCHO-MOTOR ASPECTS OF PHYSICAL ACTIVITY
Motor learning principles and performance determinants are investigated, together with other relevant psychological determinants of gross motor behaviour.
2 lects., 1 lab.; one term

PHYS ED 2C06 PHYSIOLOGY OF EXERCISE
The effects of exercise on the physiological systems, and the application of physiological principles to human exercise performance.
2 lects., 1 lab. (2); two terms

PHYS ED 2D03 PHILOSOPHY OF PHYSICAL EDUCATION AND SPORT
Critical examination of the concepts, theories, and assumptions associated with physical education and sport.
3 hrs. (lects. and discussion); one term

PHYS ED 2F03 HISTORY OF PHYSICAL EDUCATION AND SPORT IN CANADA
The origins and development of modern physical education and sport in Canada, including individual leaders and contributing cultural factors.
3 hrs. (lects. and seminars); one term

PHYS ED 3B03 ADAPTED PHYSICAL ACTIVITY
Physical activity and movement designed to meet the needs, interests, and abilities of individuals referable to special physical activity programmes.
3 lects.; one term

PHYS ED 3C03 MEASUREMENT AND EVALUATION
Introduction to research design and scientific method; elementary statistics.
3 hrs. (lect.); one term

PHYS ED 3F03 SPORT AND PHYSICAL EDUCATION ADMINISTRATION I
A macro perspective of sport organizations, including administrative functions such as planning, organizing, marketing, meeting management, scheduling, and legal liability.
3 hrs. (lects., seminars); one term

PHYS ED 3G03 BEHAVIOURAL ASPECTS OF PLAY AND GAME INVOLVEMENT
Behavioural and developmental patterns of play from infancy through adulthood are examined in light of selected theories and contemporary practices in physical education and recreation.
3 hrs. (lects.); one term

PHYS ED 3H03 HISTORICAL INTERPRETATIONS OF SPORT AND PHYSICAL ACTIVITY
Inquiry into the development of physical activity and sport from ancient to modern civilizations in the perspective of cultural change.
2 lects., 1 seminar, one term
Prerequisite: Permission of the instuctor.
Enrolment is limited.

PHYS ED 3J03 AESTHETICS OF SPORT AND DANCE
An inquiry into involvement in sport and dance and the search for meaning and reality in these non-verbal forms of expression and communication.
3 hrs. (lects., seminars); one term
With permission of the instructor this course may be taken as an elective for B.A. credit by undergraduates not in Physical Education.

PHYS ED 3K03 SPORTS INJURIES
Methods of dealing with injuries under following headings: prevention; preliminary assessment and response; first aid; basic CPR; and post-medical care.
1 lect., 1 tut., 1 lab.; one term
Prerequisite: Permission of instructor; grades in Physical Education 1A06 and 2C06 are considered in selection of students.
Enrolment is limited.

PHYS ED 3L03 SPORT AND PHYSICAL EDUCATION ADMINISTRATION II (BEHAVIOURAL CONCEPTS)
Behavioural concepts and principles.
Topic areas include the study of organizations, and individual, group and organizational processes.
3 hrs. (lects., seminars); one term
Prerequisite: Physical Education 3F03, and permission of the instructor; grades in Physical Education 3F03, PR87 (or proven administrative experience and other related course work) are considered in selection of students.
Enrolment is limited.

PHYS ED 3M03 FOUNDATIONS OF ATHLETIC COACHING
An examination of the principles governing athletic coaching with emphasis placed on the theoretical and behavioural aspects.
3 hrs.; one term
Not open to students with credit in Physical Education 3M06.

PHYS ED 3P03 SPORT AND SOCIAL DEVELOPMENT
Macro-analysis of sport and culture, considering the place of sport and leisure in cultural transmission and cultural change.
3 hrs. (lects. and discussion); one term
With permission of the instructor, this course may be taken as an elective for B.A. credit by undergraduates not in Physical Education.
Same as Sociology 3DD3.

PHYS ED 3Q03 SPORT AND SMALL GROUP DYNAMICS
Micro-analysis of sport in small social systems; investigation of the dynamics of involvement in sport encounters, the team as a small group, and sport subcultures.
3 hrs. (lects. and discussion); one term
With permission of the instructor, this course may be taken as an elective for B.A. credit by undergraduates not in Physical Education.
Same as Sociology 3EE3.

PHYS ED 3SS3 BODY, MIND, SPIRIT
An exploration of the relationship between body, mind and spirit from the standpoint of eastern and western religious thought with special reference to current perspectives.
Course work includes experiential workshops.
3 hr. seminar; one term
Prerequisite: Permission of the instructor.
Same as Religious Studies 3SS3.
Enrolment is limited.

PHYS ED 4A06 BIOMECHANICS OF HUMAN MOVEMENT
In-depth study of the mechanics of human movement with appplication to specific position and movement problems; relationship of the mechanics to selected neurophysiological mechanisms.
3 hrs. (lects., labs.); two terms
Prerequisite: Permission of the instructor; grades in Physical Education 1F03 and Physical Education 2A03 are considered in selection of students.
Enrolment is limited.

PHYS ED 4B03 PHYSICAL ACTIVITY AND CORONARY HEART DISEASE
An examination of the role of physical activity in the prevention and rehabilitation of coronary heart disease.
3 lects.; one term.

PHYS ED 4C06 HUMAN PERFORMANCE PHYSIOLOGY
Factors affecting human physical performance, with emphasis upon procedures for maximizing sport performance.
2 lects., 1 lab.; two terms
Prerequisite: Permission of instructor; grade in Physical Education 2C06 is considered in selection of students.
Enrolment is limited.

PHYS ED 4D06 FOUNDATIONS IN OUTDOOR EDUCATION
An examination of Outdoor Education programmes and their historical, philosophical and sociological foundations.
3 hrs. (lects., seminars); two terms
Prerequisite: Enrolment is reserved primarily for Level IV students (Level III students by permission of the instructor) based on previous outdoor education background.
Enrolment is limited.

PHYS ED 4E03 MOTOR CONTROL
Neuromuscular control mechanisms underlying motor skill performance. Topics include basic neuroanatomy, mechanisms of sensation and regulation of voluntary movement.
2 lects., 1 lab.; one term
Prerequisite: Permission of the instructor.
With permission of the instructor, this course may be taken as an elective for B.A. credit by undergraduates not in Physical Education.
Enrolment is limited.

PHYS ED 4F03 SELECTED TOPICS IN PHYSICAL EDUCATION
Topics of contemporary interest with emphasis upon current theory and research. Students should consult the undergraduate department concerning the topics to be examined.
3 hrs. (lects., seminars); one term

PHYS ED 4H03 FITNESS-AND WELLNESS-CONCEPTS AND APPRAISAL TECHNIQUES
The concepts and principles of fitness and wellness will be studied with an examination and appliction of fitness and wellness appraisal techniques.
3 hrs. (lects., labs, presentations); one term

PHYS ED 4I03 PHYSICAL ACTIVITY, LEISURE AND AGING
An examination of concepts and theories of physical activity and leisure with respect to aging and vitality in later life.
3 hrs. (lects.); one term.
Prerequisite: Registration in Level III or IV Physical Education or Gerontology programme or permission of the instructor.
Same as Gerontology 4I03.
Not open to students with credit in Physical Education 4F03 in 1987/88 or 1988/89.

PHYS ED 4J03 PERSPECTIVES IN DANCE: DANCE IN CONTEMPORARY SOCIETY
A survey of modern dance forms of the 20th century and their relationship to education, therapy, injuries, technology and aesthetics.
Students view films, attend performances and participate in dance workshops.
3 hrs. (lects., seminars); one term
With permission of the instructor, this course may be taken as an elective for B.A. credit by undergraduates not in Physical Education.
Same as Drama 4J03.

PHYS ED 4K03 PERCEPTUAL-MOTOR BEHAVIOUR: AN INTEGRATIVE ANALYSIS
An advanced examination of current topics regarding perceptual-motor behaviour with particular reference to everyday experiences.
3 hrs. (lects., labs.); one term
Prerequisite: Permission of the instructor; grade in Physical Education 2B03 is considered in selection of students.
Enrolment is limited.

PHYS ED 4L03 COMPARATIVE PHYSICAL EDUCATION AND SPORT (SELECTED TOPICS)
Contemporary physical education in selected countries, with special attention given to international sports competition.
2 lects., 1 seminar; one term
Prerequisite: Permission of the instructor; grade in Physical Education 2F3 is considered in selecting Physical Education students.
With permission of the instructor, this course may be taken as an elective for B.A. credit by undergraduates not in Physical Education.
Enrolment is limited.

PHYS ED 4M03 PSYCHO-SOCIAL ASPECTS OF SKILL
Perceptual and social-psychological principles applied to specific problems in skill development. Research on motivation, arousal perception, personality and competition is discussed.
2 lects., 1 lab.; one term
With permission of the instructor, this course may be taken as an elective for B.A. credit by undergraduates not in Physical Education.
Enrolment is limited.

PHYS ED 4N03 AHTLETIC COACHING: PRACTICAL AND APPLIED SCIENTIFIC ASPECTS
Analysis of bio-physical components of athletic coaching emphasizing planning and implementation of a yearly training programme. Feedback on field experience will be the central focus.
3 hrs.; one term
Prerequisite Physical Education 3M03; and permission of the instructor. Students registered in 4N03 must also register for PR88 (Coaching Placement Experience). Not open to students with credit in Physical Education 3M06.

PHYS ED 4O03 HEALTH SCIENCE: PHYSICAL AND ENVIRONMENTAL
Selected transactions between the individual, the environs and disease agents are explored as these transactions influence human diseases.
3 hrs. (lects., seminars); one term

PHYS ED 4P03 HEALTH SCIENCE: BEHAVIOURAL
Development of an understanding of those health topics based primarily on the behavioural sciences. Specifically included are mental health, psychoactive drugs, and human sexuality.
3 hrs. (lects., seminars); one term

PHYS ED 4Q03 PEDIATRIC EXERCISE PHYSIOLOGY
Physiologic aspects of physical activity in children and adolescents in health and disease.
2 lects., 1 lab.; one term
Prerequisite: Permission of the instructor; grade in Physical Education 2C06 is considered in selection of students.
With permission of the instructor this course may be taken as an elective for B.A. credit by undergraduates not in Physical Education.
Enrolment is limited.

PHYS ED 4R03** INDIVIDUAL STUDY PROJECT
Investigation of a selected theoretical or applied problem mutually acceptable to instructor and student.
Prerequisite: Permission of the Chairman and supervising instructor. Open to Level IV B.P.E. students.

PHYS ED 4S03 ADAPTED PHYSICAL ACTIVITY
To equip students to design and conduct activity programmes. Focus on mental retardation but also application of principles to a variety of populations.
Lects., seminars, labs., fieldwork; one term
Prerequisite: Physical Education 3B03 and permission of instructor.
Enrolment is limited.

PRACTICUM COURSES

In the four levels of the B.P.E. programme, each student must complete a minimum of 13 units of practicum.

One unit of practicum will normally comprise 24 hours; these hours may be compressed into one week (Camp or Orientation Week), spread over a Term (Field Work Placement) or, more usually, extend over a 6 week period of 4 hours per week.

In Levels III and IV a variety of Basic and Advanced practicum courses are offered.

Selection and Required Achievement in Practicum Classes

All practicum courses, in all Levels, must be completed with a *minimum grade of D−* in each.

Level I: 1 unit

Level I students normally take the McMaster Basic Swimming Test and PRO2 Basic Gymnastics.

Level II: 4 units

Level II students normally take PRO3 Track and Field, PRO4 Games, PRO5 Dance and PR06 Fitness.

Levels III and IV: 8 units

Level III and IV students normally take four (4) units per Level.

General Regulations

1. In order for a student to attend an Advanced course, e.g. Advanced Hockey, the permission of the appropriate instructor must be obtained.
2. Students requiring direct entry into an Advanced course without meeting the requirements of the appropriate preceding basic course (s), must satisfy the instructor, both practically and theoretically, that they are qualified. The prerequisite standard for Advanced level courses *does not* give credit for, nor does it count as, one of the 13 units required by the Department.
3. Any students wishing to take more than 2 units of Field Work practicum may do so *in addition to* the minimum of 13 units.
4. A student wishing to take more than four courses per Level, or more than one course per session, must obtain permission from the Chairman of the Department.

Outdoor Activity Courses

Courses in outdoor activities, e.g., canoe tripping, skiing, rock climbing, etc. may be offered outside the regular time-tabled programme and in off-campus settings.

It is not compulsory to take a course from the outdoor activity area, but interested students will receive comparable recognition for satisfactory completion of such courses, that is: one unit credit for each 24-hour course completed with at least a D− grade. A course fee is normally required in these offerings.

Field Work Practicum

Practicums may also be offered in the form of field work or leadership experiences, e.g., Cardiac Rehabilitation, Outdoor Education, Administration.

The Field Work practicum occurs outside the normal time-tabled schedule, and requires permission from the supervising instructor.

Physics

Faculty as of January 15, 1989

P.G. Sutherland/*Chairman*
C. Kallin/*Associate Chairman*

Professors Emeriti

Bertram N. Brockhouse/B.A. (*British Columbia*), M.A., Ph.D. (*Toronto*), D.Sc. (*Waterloo, McMaster*), F.R.S.C., F.R.S.
Martin W. Johns/M.A. (*McMaster*), Ph.D. (*Toronto*), D.Sc. (*Brandon*), F.R.S.C.
John A. Kuehner/B.Sc. (*Bishop's*), M.A. (*Queen's*), Ph.D. (*Liverpool*), F.R.S.C.
Carman C. McMullen/M.Sc., Ph.D. (*McMaster*)
Melvin A. Preston/B.A., M.A. (*Toronto*), Ph.D. (*Birmingham*), D.Sc. (*McMaster*), C.D., F.R.S.C.
Robert G. Summers-Gill/M.A. (*Saskatchewan*), Ph.D. (*California*)
Anatole B. Volkov/B.S. (*North Carolina*), M.S., Ph.D. (*Wisconsin*)

Professors

Edward A. Ballik/B.Sc. (*Queen's*), D.Phil. (*Oxford*)
A. John Berlinsky/B.Sc. (*Fordham*), M.Sc., Ph.D. (*Pennsylvania*)
Rajat K. Bhaduri/M.Sc. (*Calcutta*), Ph.D. (*McMaster*)
I. David Brown/B.Sc., Ph.D. (*London*)
Dennis G. Burke/B.E., M.Sc. (*Saskatchewan*), Ph.D. (*McMaster*)
John A. Cameron/B.A. (*Toronto*), Ph.D. (*McMaster*)
Jules P. Carbotte/B.Sc. (*Manitoba*), M.Sc., Ph.D. (*McGill*), F.R.S.C
W. Brian Clarke/B.A. (*Dublin*), Ph.D. (*McMaster*)
Malcolm F. Collins/M.A., Ph.D. (*Cambridge*)
W. Ross Datars/M.Sc. (*McMaster*), Ph.D. (*Wisconsin*), F.R.S.C.
Brian K. Garside/B.A., D.Phil. (*Oxford*)/part-time
David A. Goodings/B.A. (*Toronto*), Ph.D. (*Cambridge*)
Archie A. Harms/B.Sc. (*British Columbia*), M.Sc.Eng., Ph.D. (*Washington*), P.Eng.
William E. Harris/B.Sc. (*Alberta*), M.Sc., Ph.D. (*Toronto*)
Terence J. Kennett/M.Sc., Ph.D. (*McMaster*)
Yukihisa Nogami/B.Sc., D.Sc. (*Kyoto*)
William V. Prestwich/B.Sc., Ph.D. (*McMaster*)
Donald W.L. Sprung/B.A. (*Toronto*), Ph.D., D.Sc. (*Birmingham*), F.R.S.C.
Carl V. Stager/B.Sc. (*McMaster*), Ph.D. (*M.I.T.*)
Peter G. Sutherland/B.Sc. (*McGill*), M.S., Ph.D. (*Illinois*)
David W. Taylor/B.A., D.Phil. (*Oxford*)
Thomas Timusk/B.A. (*Toronto*), Ph.D. (*Cornell*)

James C. Waddington/B.Sc. (*Queen's*), Ph.D. (*McMaster*)
Derek Walton/B.Sc. (*Toronto*), Ph.D. (*Harvard*)

Associate Professor

Ralph E. Pudritz/B.Sc. (*British Columbia*), M.Sc. (*Toronto*), Ph.D. (*British Columbia*)

Assistant Professors

Bruce D. Gaulin/B.Sc. (*McGill*), Ph.D. (*McMaster*)
Catherine Kallin/B.Sc. (*British Columbia*), A.M., Ph.D. (*Harvard*)
David E. Venus/B.Sc. (*Queen's*), Ph.D. (*Toronto*)
Douglas L. Welch/B.Sc., Ph.D. (*Toronto*)

Associate Members

Michael S. Patterson/B.Sc. (*Queen's*), M.Sc. (*McMaster*), Ph.D. (*Toronto*) (Radiology)
David A. Thompson/B.Sc., Ph.D. (*Reading*) (Engineering Physics)
Brian C. Wilson/B.Sc., Ph.D. (*Glasgow*) (Radiology)

Senior Demonstrator

J. Everett Cairns/B.Eng., M.Sc. (*McMaster*)

Department Notes:

1. The Department reserves the right to withdraw a Level III or IV course which is not specifically required in a Physics programme if the registration falls below four.
2. Students in Level III or IV of Physics programmes will find a number of relevant electives among offerings of the Department of Biology and the Department of Engineering Physics.

PHYSICS 1A06 MECHANICS, ELECTRICITY AND MODERN PHYSICS
Lectures and laboratory work on mechanics, electricity, atomic and nuclear physics. Primarily intended for students proceeding in the physical sciences.
3 lects., 1 lab. (3) every other week; two terms
Prerequisite: At least 70% in Grade 13 or OAC Physics, and registration in Mathematics 1A06 or Arts and Science 1D06, and Mathematics 1B03.

PHYSICS 1B06 GENERAL PHYSICS I
Lectures, demonstrations, and laboratory work in general physics. This course places less stress on the use of mathematics, and covers a wider range of topics, than Physics 1A06. Intended primarily for students proceeding in the life sciences.
3 lects., 1 lab. (3) every other week; two terms
Prerequisite: At least 60% in Grade 13 or OAC Physics, and registration in one of Mathematics 1A06, 1C06 or Arts and Science 1D06.

PHYSICS 1C06 INTRODUCTORY PHYSICS
Lectures and demonstrations in physics, with particular stress on topics in mechanics, wave motion, optics and electricity, for students without Grade 13 or OAC Physics.
3 lects, 1 tut., 1 lab. (3) every other week; two terms
Prerequisite: Registration in one of Mathematics 1A06, 1C06 or Arts and Science 1D06.

PHYSICS 1D03 INTRODUCTORY MECHANICS
A course for engineering students. Statics, kinematics, Newtonian dynamics, energy.
3 lects.; 1 lab. (3) every other week.; one term
Prerequisite: Registration in Engineering I.

PHYSICS 1E03 WAVES, ELECTRICITY AND MAGNETIC FIELDS
A course for engineering students. Oscillations and waves, interference; electrostatics, electric potential, circuit elements; magnetic fields, magnetic induction.
3 lects., 1 lab. (3) every other week; one term
Prerequisite: Registration in Engineering I.

PHYSICS 2A03 GENERAL PHYSICS II
A sequel to Physics 1B06. Electricity and magnetism. Intended primarily for students proceeding in the life sciences.
3 lects.; one term
Prerequisite: One of Physics 1A06, 1B06, 1C06, and one of Mathematics 1A06, 1C06 or Arts and Science 1D06. Not open to students in Honours Chemistry and Physics, Honours Physics, Honours Applied Physics, Physics Major, or B.Sc. in Physics.

PHYSICS 2B06 ELECTRICITY AND MAGNETISM
Electrostatics, D.C. and A.C. circuits, the magnetic field; Faraday's law of induction; Maxwell's equations.
3 lects., first term; 2 lects., second term; 1 lab. (3) every other week; two terms
Prerequisite: One of Physics 1A06, 1B06, 1C06, and concurrent registration in Mathematics 2G03 and 2O03, or 2A06 and 2C03.

PHYSICS 2C05 MECHANICS
Dynamics of a particle, central field problem, many-particle systems, the mechanics of rigid bodies, Lagrange's equations, introduction to the special theory of relativity.
2 lects., 1 tut.; two terms
Prerequisite: Registration in a programme in which Physics 2C05 is required or is a specified option. Not open to students who are registered or have credit in, Physics 2G03.

PHYSICS 2E03 ASTRONOMY AND THE SOLAR SYSTEM
Basic observational astronomy. Historical development of ideas about the solar system. A modern view of the planets; the origin and evolution of the solar system.
3 lects.; one term
Prerequisite: One of Physics 1A06, 1B06, 1C06, and one of Mathematics 1A06, 1C06 or Arts and Science 1D06. Not open to students with credit in Physics 2E06.
Alternates with Physics 2F03.

PHYSICS 2F03 A SURVEY OF STELLAR AND GALACTIC ASTRONOMY
The physical properties of stars and stellar evolution. The interstellar medium. Galactic structure. Normal and peculiar galaxies. Cosmology and the large-scale distribution of matter in space.
3 lects.; one term
Prerequisite: One of Physics 1A06, 1B06, 1C06 and one of Mathematics 1A06, 1C06 or Arts and Science 1D06. Not open to students with credit in Physics 2E06.
Alternates with Physics 2E03.

PHYSICS 2G03 MECHANICS OF A PARTICLE
Vectorial treatment of the mechanics of a particle in three dimensions.
2 lects., 1 tut.; one term
Prerequisite: One of Physics 1A06, 1B06, 1C06, and Mathematics 1B03 or registration in Mathematics 2G03. Not open to students who are registered or have credit in, Physics 2C05.

PHYSICS 2H03 THERMAL PHYSICS
Introduction to heat and the kinetic theory of gases.
2 lects., 1 lab. (3); one term
Prerequisite: One of Physics 1A06, 1B06, 1C06, and Mathematics 1A06 or Arts and Science 1D06. Not open to students who are registered or have credit in, any of Chemistry 2P06, 2Q06, 2T06.

PHYSICS 2J03 PHYSICS OF MUSICAL SOUND
Sound waves, production of sound by musical instruments; properties of the ear, musical scales and intervals; auditorium acoustics.
3 lects. with demonstrations; one term
Prerequisite: Registration in Level II, III or IV of a non-science programme. Knowledge of Grade 12 mathematics would be helpful.

PHYSICS 2M03 MECHANICS
An introduction to mechanics with applications primarily based in kinesiology, kinematics; dynamics; rotational dynamics.
3 lects.; one term
Prerequisite: Registration in Level II, III or IV of a Physical Education programme. Knowledge of Grade 12 mathematics is required.

PHYSICS 3A03 RELATIVITY
An introduction to general relativity.
3 lects.; one term
Prerequisite: Physics 2C05, and registration in any Honours programme in Science or in the Faculty of Engineering; or permission of the instructor.
Offered in 1990-91 and in alternate years.

PHYSICS 3B06 ELECTRONICS
Network theory and filters, semiconductor devices, amplifier circuits, D.C. power supplies, integrated circuits, operational amplifiers and digital circuits.
2 lects., both terms; 1 lab. (2); two terms
Prerequisite: Physics 2B06, or Engineering Physics 2A03 and 2E04.

PHYSICS 3G03 SEISMOLOGY
Methods of seismic exploration; earthquakes; studies of the earth's interior.
3 lects.; one term
Prerequisite: Physics 2C05 or 2G03, *and* Mathematics 2G03 and 2O03 or 2A06 and 2C03.
Offered in 1990-91 and in alternate years.

PHYSICS 3H04 INTERMEDIATE LABORATORY
Experiments in atomic and neutron physics, optics and spectroscopy, mechanics.
1 lect., one term; 1 lab. (3) two terms
Prerequisite: Physics 2B06, and completion of or registration in Physics 3M03, 3M06 or 3O03.

PHYSICS 3K04 THERMODYNAMICS AND STATISTICAL MECHANICS
The laws of thermodynamics, with emphasis on the mathematical structure of the theory; classical and quantum statistical mechanics.
2 lects.; two terms
Prerequisite: Physics 2H03, *and* Mathematics 2G03 and 2O03 or 2A06 and 2C03. Not open to students with credit in Chemistry 4Y03.

PHYSICS 3M03 QUANTUM MECHANICS AND ITS APPLICATIONS I
An introductory course in quantum mechanics with applications to natural phenomena.
3 lects.; one term
Prerequisite: Physics 2B06 or Engineering Physics 2A03 and 2E04 or Engineering 2M04, *and* Mathematics 3C03 or 3D03; or registration in Honours Mathematics and Physics. Mathematics 3D03 may be taken concurrently. Not open to students with credit in Physics 3M06.

PHYSICS 3MM3 QUANTUM MECHANICS AND ITS APPLICATIONS II
A continuation of Physics 3M03.
3 lects.; one term
Prerequisite: Physics 3M03. Not open to students with credit in Physics 3M06.

PHYSICS 3N03 PHYSICAL OPTICS
Interference; Fraunhofer and Fresnel diffraction; Maxwell's equations and the electromagnetic character of light; polarization and double refraction; interference of polarized light; selected topics in modern optics.
3 lects.; one term
Prerequisite: Physics 2B06 or Engineering Physics 2A03 and 2E04, *and* Mathematics 2G03 and 2O03 or 2A06 and 2C03 or 2P04 and 2Q04.

PHYSICS 3O03 MODERN PHYSICS
Special relativity. Selected topics in photon physics, atomic physics, and quantum physics.
3 lects.; one term
Prerequisite: Physics 2A03 or 2B06. Not open to students with credit or registration in Physics 3M03 or 3M06.

PHYSICS 3Q03 INTRODUCTION TO QUANTUM MECHANICS
Operator algebra. The Schrödinger equation. The square well, harmonic oscillator, barriers, perturbations, transition matrix elements, and selected three dimensional problems.
3 lects.; one term
Prerequisite: Physics 3O03, and Mathematics 3C03 or 3C06. Not open to students with credit or registration in Physics 3MM3 or 3M06.

PHYSICS 3S03 PHYSICS OF THE EARTH
Special topics in physics applied to earth sciences. Structure of the earth's interior, geomagnetism, global tectonics, nuclear techniques in geophysics.
3 lects.; one term
Prerequisite: Physics 2B06 or Engineering Physics 2A03 and 2E04, *and* Mathematics 2G03 and 2O03 or 2A06 and 2C03; or permission of the instructor. Not open to students with credit in Physics 4S03.
Offered in 1989-90 and alternate years.

PHYSICS 3T03 INTERACTION OF RADIATION WITH MATTER
The interactions of nuclear radiations with matter: detectors, dosimetry, tracer methods, the production and use of X-rays.
3 lects.; one term
Prerequisite: Registration in or completion of Physics 3O03, 3M03 or 3M06.

PHYSICS 3X03 STARS AND STELLAR SYSTEMS
Observational properties of stars. Distance measurement in space. Galactic structure; properties of Galaxies, and cosmology.
3 lects. and occasional lab. periods; one term
Prerequisite: Physics 2C05 or 2G03, Physics 2B06 and 2H03, Computer Science 1B03 or 1MA3; or permission of the instructor.
Offered in 1989-90, alternating with Physics 3Y03.

PHYSICS 3Y03 STELLAR STRUCTURE
The physics of stellar interiors. The main sequence and the life cycle of a star. Stellar evolution, including white dwarfs, neutron stars, and black holes.
3 lects.; one term
Prerequisite: Physics 2C05 or 2G03, Physics 2B06 and 2H03, Computer Science 1B03 or 1MA3; or permission of the instructor.
Offered in 1990-91, alternating with Physics 3X03.

MATH 3C03 MATHEMATICAL PHYSICS I
Linear algebra and eigenvalue problems, partial differential equations, orthogonal functions, Fourier series, Legendre functions, spherical harmonics.
3 lects.; one term
Prerequisite: Mathematics 2A06 and 2C03 or 2G03 and 2O03 or 2P04 and 2Q04, *and* Physics 2C05 or 2G03. Not open to students who have credit for, or are registered in, Mathematics 3J04, 3K03, or 3V06.

MATH 3D03 MATHEMATICAL PHYSICS II
Functions of a complex variable, probability and statistics, boundary value problems, Bessel functions.
3 lects.; one term
Prerequisite: Mathematics 3C03. Not open to students who have credit in, or are registered in, Mathematics 3J04, 3K03, 3V06.

PHYSICS 4A02 SPECIAL TOPICS
Independent study of the scientific literature, including the preparation of seminars on assigned topics.
2 lects. or seminars; two terms
Prerequisite: Registration in a programme in which Physics 4A02 is required or is a specified option.

PHYSICS 4B04 ELECTROMAGNETIC THEORY
Development of Maxwell's equations; multipoles, series solutions, special relativity and radiation from dipoles.
2 lects.; two terms
Prerequisite: Physics 2B06 or Engineering Physics 2A03 and 2E04, *and* Mathematics 3C06 or 3D03; or registration in Honours Mathematics and Physics.

PHYSICS 4C03 ANALYTICAL MECHANICS
Variational principles, Lagrange's equations, small oscillations, Hamilton's equations, canonical transformations, Hamilton-Jacobi theory, canonical perturbation theory, continuous systems and fields.
3 lects.; one term
Prerequisite: Mathematics 3C06 or completion of or registration in Mathematics 3D03, and registration in any Honours Science programme or any programme in the Faculty of Engineering; or registration in Honours Mathematics and Physics; or permission of the instructor.
Offered in 1989-90 and in alternate years.

PHYSICS 4D06 DIGITAL LOGIC AND COMPUTER SYSTEMS
The design and use of digital logic systems and their application to data acquisition and control techniques. The project-oriented laboratory involves both hardware and software.
2 lects., 1 lab. (3); two terms
Prerequisite: Physics 2B06, or Engineering Physics 2A03 and 2E04. Not open to students with credit or registration in any of Computer Engineering 2HA3, 3HB3, Electrical Engineering 2H03, 3H03.

PHYSICS 4E03 NUCLEAR PHYSICS
Nuclear masses and stability; radioactivity and nuclear reactions; elementary nuclear models.
3 lects.; one term
Prerequisite: Physics 3MM3 or 3M06, or a grade of at least B– in Physics 3Q03, or registration in Level IV Physics Major (Health and Radiation Option).

PHYSICS 4F03 QUANTUM MECHANICS
A sequel to Physics 3MM3, including general structure of quantum mechanics, matrix mechanics, perturbation theory, and the variational method.
3 lects.; one term
Prerequisite: Physics 3MM3 or 3M06, and Mathematics 3C06 or 3D03; or registration in Honours Mathematics and Physics.

PHYSICS 4G03 COMPUTATIONAL PHYSICS
A course using microcomputers to solve selected problems in physics. The emphasis is in applying computational methods to physics, rather than numerical methods or computer programming.
1 lab. (3); one term
Prerequisite: Physics 3M06 or 3MM3; Computer Science 1MA3 or 1B03 or permission of the instructor.

PHYSICS 4J04 ADVANCED LABORATORY
Projects in atomic, nuclear and solid state physics. Three or four projects are required, one of which may be associated with a faculty research programme.
1 lab. (3); two terms
Prerequisite: Registration in a programme in which Physics 4J04 is required or is a specified option; or permission of Chairman of Department.

PHYSICS 4K03 SOLID STATE PHYSICS
Crystal structure and binding; lattice vibrations; electron energy bands; metals and semiconductors; magnetism.
3 lects.; one term
Prerequisite: Physics 3MM3 or 3M06, or a grade of at least B– in 3O03 and 3Q03.

PHYSICS 4Q04 RESEARCH PROJECT
An experimental or theoretical project to be carried out under the supervision of a faculty member. A report will be required.
Lab. (6); two terms
Prerequisite: Registration in Level IV Honours or Major Health and Radiation Physics programme; or registration in Level IV of any Physics programme, a C.A.A. of at least 10.0, and permission of the Chairman of the Department.

PHYSICS 4R03 RADIATION AND RADIOISOTOPE METHODOLOGY
Lectures and laboratory work in the techniques and theory of the measurement of radiation. Topics include radioactivity and radioactive decay, solid state dosimetry, principles of radioactive detectors, counting statistics and data reduction, advanced multidetector systems.
1 lect., 1 lab. (3) every other week; two terms
Prerequisite: Physics 2B06 or Engineering Physics 2A03 and 2E04, *and* registration in Honours or Major programme in Health and Radiation Physics; or permission of the instructor.

PHYSICS 4T03 TOPICS IN RADIOLOGICAL PHYSICS
Analysis of current techniques in radiation protection, medical imaging and therapy.
3 lects.; one term
Prerequisite: Physics 3T03 or Engineering Physics 3D03, *and* Mathematics 2G03 and 2O03, or 2A06 and 2C03.

PHYSICS 4U03 PARTICLE PHYSICS
Mesons and baryons; the quark model; local gauge invariance; symmetries; the electromagnetic, weak and strong interactions.
3 lects.; one term
Prerequisite: Physics 4F03; or permission of the instructor.

For **Graduate Courses** see *Calendar of School of Graduate Studies.*

Polish

Courses in *Polish* are administered within the Department of Modern Languages of the Faculty of Humanities.

POLISH 1Z06 BEGINNER'S POLISH
An introduction to basic conversational and written Polish, teaching the skills of listening, speaking, reading, and writing.

5 hrs. (lects. and lab. practice); two terms
Prerequisite: Open. Students with prior knowledge of the language as determined by a placement test may be required to take an appropriate alternative.
Not offered in 1989-90

POLISH 2Z06 INTERMEDIATE POLISH
A course designed to further the student's command of oral and written Polish. It will concentrate on developing conversational skills as well as studying basic grammatical structures and rules of composition.
4 hrs.; two terms
Prerequisite: Polish 1Z06 or permission of the Department.

Political Science

Faculty as of January 15, 1989

Michael M. Atkinson/*Chairman*

Professors Emeriti

Derry Novak/B.A. (Toronto)
Klaus H. Pringsheim/B.A. *(California, Los Angeles)*, M.A. *(Columbia)*
Thomas C. Truman/B.A. *(Melbourne)*, M.A. *(Queensland)*

Professors

Michael M. Atkinson/B.A. *(Alberta)*, M.A., Ph.D. *(Carleton)*
Adam Bromke/M.A. *(St. Andrews)*, Ph.D. *(Montreal and McGill)*
William M. Chandler/B.A. *(Cornell)*, Ph.D. *(North Carolina)*
Marshall N. Goldstein/B.A. *(Florida)*, Ph.D. *(North Carolina)*
Gordon P. Means/B.A. *(Reed College)*, M.A., Ph.D. *(Washington)*
Kim Richard Nossal/B.A., M.A., Ph.D. *(Toronto)*
Peter J. Potichnyj/B.A. *(Temple)*, M.A., Ph.D. *(Columbia)*
Mark Sproule-Jones/B.Sc. *(London)*, M.A., Ph.D., *(Indiana)*/V.K. Copps Chair in Urban Studies
Michael B. Stein/B.A. (McGill), M.A., Ph.D. *(Princeton)*

Associate Professors

Howard Aster/B.A. *(McGill)*, M.A. *(Yale)*, Ph.D. *(London)*
George B. Breckenridge/M.A. *(Glasgow and Duke)*, Ph.D. *(Duke)*
William D. Coleman/B.A. *(Carleton)*, A.M., Ph.D. *(Chicago)*
Henry J. Jacek/B.S.S. *(Fairfield)*, M.A., Ph.D. *(Georgetown)*
Thomas J. Lewis/B.A. *(Carleton)*, M.A., Ph.D. *(SUNY, Buffalo)*
Roman R. March/B.A. *(Manitoba)*, M.A. *(Carleton)*, Ph.D. *(Indiana)*
John W. Seaman/B.A. *(Mount Allison)*, M.A. *(Dalhousie)*, Ph.D. *(Toronto)*

Assistant Professors

Barbara A. Carroll/B.A. *(Manitoba)*, M.A. *(Carleton)*, Ph.D. *(American)*
Stefania S. Miller/M.A. *(McMaster)*, Ph.D. *(Toronto)*
Geoffrey R. Underhill/B.A. *(Queen's)*, D. Phil. *(Oxford)*
Charlotte A. B. Yates/B.A. *(Winnipeg)*, M.A. *(Queen's)*, Ph.D. *(Carleton)*

Associate Members

Howard M. Brotz/ *(Sociology)*, B.A., M.A. *(Chicago)*, Ph.D. *(London)*
Rhoda E. Howard/ (Sociology), B.A., M.A., Ph.D. *(McGill)*

Department Notes:

1. The Department of Political Science offers courses in four main areas: Canadian Politics, Comparative Politics, Political Theory, and International Politics. The courses are grouped as follows:

   Canadian Politics: Political Science 2G06, 3DD6, 3EE3, 3FF3, 3GG3, 3HH3, 3II3, 3JJ3, 3NN6, 3S03, 3Z06, 4CC3, 4K06, 4O06, 4P03, 4S06, 4W06.

   Comparative Politics: Political Science 2B06, 2K06, 2M06, 2P06, 3B06, 3D03, 3GG3, 3M06, 3MM6, 3PP3, 3Q06, 3QQ3, 3RR3, 3T03, 3V03, 3VV3, 3W03, 3Y06, 4AA6, 4CC3, 4D06, 4F06, 4G06, 4J06, 4P03, 4Q06.

   Political Theory: Political Science 2O06, 3A06, 3I06, 3KK6, 3LL6, 3O06, 3R03, 4BB6, 4DD6, 4E06, 4S06, 4U06.

   International Politics: Political Science 2E06, 3AA3, 3BB3, 3CC3, 3FF3, 4M06, 4F06, 4V06.

   The remaining courses are grouped as follows:

   Research Methods: Political Science 2F06, 3G03, 3H03, 3U03

   Other: Political Science 1A06, 3UU3, 4Z06

2. All students should be alerted to those Level II Political Science courses that are required in order to qualify for a number of Level III and IV courses.

   Recommended Courses: Political Science 2F06 and 2O06 are recommended to students enrolled in Honours Political Science because their conceptual concerns underlie all political analysis. Students wishing to enter courses without the necessary prerequisites must receive written permission from the instructor.

3. Not all the Political Science courses listed in this Calendar are taught every year. Students are advised to consult the Department after April 1 for a list of courses to be offered in the following academic year.

   All students are encouraged to seek advice from members of the Department in developing a programme of study.

   All *Honours students* are strongly advised to discuss their programme with an Undergraduate Advisor, and to have it checked to ensure that it meets Departmental requirements.

4. Level IV Political Science courses identified as "enrolment limited" courses have a limit of eighteen students for courses not cross-listed in the Graduate Calendar and fourteen undergraduate students for courses which are cross-listed★. Admission to these courses is given by a pre-registration preferential ballot. Preference will be given in order to students in the following categories: Level IV Honours Political Science and Combined Honours Political Science; Continuing students who are in Level IV; Level III Honours Political Science and Combined Honours Political Science; B.A. in Political Science; Others. Undergraduate students are strongly advised to consult the Department no later than May 1 for information regarding balloting for limited enrolment courses for the following academic year. **Students must obtain a "permission slip" from the Department in order to register in limited enrolment courses.** (★The following Level IV courses are cross-listed in the Graduate Calendar for graduate credit: 4BB6; 4E06; 4O06; 4G03; 4U03).

POL SCI 1A06 AN INTRODUCTION TO THE STUDY OF POLITICS
An introduction to various aspects of political science which students will encounter in subsequent years in the Department. The course is taught in a number of sections; each section is directed by one or two members of the Department.
3 hrs. (lects. and tuts.); two terms
Prerequisite: Open.

POL SCI 2B06 POLITICS IN THE U.S.A.
A study of the development, nature, and functioning of the political system of the U.S.A.
3 hrs. (lects.); two terms
Prerequisite: Open.

POL SCI 2C06 CULTURE AND POLITICS OF SOUTHERN ASIA AND NORTH AFRICA
An introduction to the civilizations of Islam and Hinduism and a survey of social movements and contemporary political trends across North Africa and Southern Asia.
3 hrs. (lects.); two terms
Prerequisite: A course in Political Science.

POL SCI 2E06 INTERNATIONAL POLITICS
A study of the institutions and processes of the international political system.
3 hrs. (lects. and tuts.); two terms
Prerequisite: Political Science 1A06 is highly recommended.

POL SCI 2F06 THE SYSTEMATIC STUDY OF POLITICS
An introduction to the study of concept and theory formation, and an overview of the scope, research methods, and statistical techniques of political science.
3 hrs. (lects. and tuts.); two terms
Prerequisite: Open, except to students with credit or registration in Economics 2B03, Chemical Engineering 4C03, Commerce 2QA3, Geography 2L03, Psychology 2G03, 2R06, or any Statistics course other than Statistics 2D03.

POL SCI 2G06 POLITICS IN CANADA
A study of the development, nature and functioning of the political system of Canada.
3 hrs. (lects. and tuts.); two terms
Prerequisite: Open.

POL SCI 2K06 POLITICS IN THE U.S.S.R.
An analysis of the political ideology, institutions, and practices of the U.S.S.R.
3 lects.; two terms
Prerequisite: Open.

POL SCI 2M06 INTRODUCTION TO FAR EASTERN POLITICAL TRADITIONS
A general introduction to the traditional political ideas and institutions of China and several other countries in Northeast Asia.
3 hrs. (lects.); two terms
Prerequisite: Open.
Offered in alternate years.

POLITICAL SCIENCE

POL SCI 2O06 INTRODUCTION TO POLITICAL THEORY

An introduction to modes of thinking theoretically about politics, expressed in political philosophy, ethical theory, history of political thought, political science, and structuralism.
3 hrs. (lects.); two terms
Prerequisite: Open.

POL SCI 2P06 POLITICS IN WESTERN EUROPE

An introduction to comparative political analysis with an emphasis on the politics of France, West Germany, Italy and Great Britain.
3 hrs. (lects.); two terms
Prerequisite: Open.

POL SCI 3A06 HISTORY OF POLITICAL IDEAS

A study of the political ideas of some eminent thinkers from classical times to the 19th century.
3 lects.; two terms
Prerequisite: Political Science 2O06; or permission of the instructor.

POL SCI 3AA3 INTERNATIONAL POLITICS IN THE POST WAR PERIOD

A survey of international relations since the end of the Second World War, focusing on the Cold War, and its impact on the international system.
3 hrs. (lects. and seminars); one term
Prerequisite: Political Science 2E06.
Not open to students with credit in Political Science 3AA6.

POL SCI 3B06 SOCIOECONOMIC DEVELOPMENT IN AFRICA

Selected topics in politics and social structure in sub-Sahara Africa.
3 hrs. (lects., and seminars); two terms
Prerequisite: A Political Science course beyond Level I.
Same as Sociology 3C06.

POL SCI 3BB3 APPROACHES TO THE STUDY OF INTERNATIONAL POLITICS

An examination of the theoretical approaches to the study of international relations.
3 hrs. (lects., and seminars); one term
Prerequisite: Political Science 2E06.

POL SCI 3CC3 INTERNATIONAL ORGANIZATIONS

An analysis of the principles, structure, and functions of the United Nations and affiliated international organizations.
3 hrs. (lects. and seminars); one term
Prerequisite: Political Science 2E06.

POL SCI 3D03 COMPARATIVE POLITICS: SOUTHEAST ASIAN SYSTEMS

A comparative analysis of political processes in Southeast Asian states in the post-colonial era.
3 hrs. (lects. and seminars); one term
Prerequisite: A course in Political Science or Asian Studies.

POL SCI 3DD6 POLITICAL PARTICIPATION AND ELITIST POLITICS IN CANADA

An analysis of the impact of social structure, ideology, and political culture on structures of political participation and elitist politics in Canada.
3 hrs. (lects and seminars); two terms
Prerequisite: Political Science 2G06.

POL SCI 3FF3 CANADIAN FOREIGN POLICY

An analysis of recent issues in Canada's external relations designed to indicate themes, problems and constraints in the making and execution of foreign policy in Canada.
3 hrs. (lects. and seminars); one term
Prerequisite: Political Science 2E06 or 2G06.

POL SCI 3G03 INTRODUCTION TO INDUCTIVE STATISTICS

An outline of levels of measurement and descriptive statistics, and a study of the logic of statistical inference and its applications.
3 hrs. (lects. and labs.); one term
Prerequisite: Political Science 2F06. Not open to students with credit or registration in Economics 3O06 or Statistic 3D06.

POL SCI 3GG3 POLITICS OF FEDERALISM

An analysis of the constitutional framework, and evolution of the federal system in Canada and/or other Western countries.
3 hrs. (lects. and seminars); one term
Prerequisite: Political Science 2G06, or 6 units of Level II courses in Comparative Politics.

POL SCI 3H03 STATISTICAL APPLICATIONS

This course builds upon the concepts taught in Political Science 3G03, and examines how statistical techniques can be used to analyze political problems.
3 hrs. (lects and seminars); one term
Prerequisite: Political Science 2F06; or permission of the instructor.

POL SCI 3HH3 INTERGOVERNMENTAL RELATIONS IN CANADA

An analysis of selected policy areas focusing on governmental resources, strategies, tactics and the outcomes of bargaining between governments in Canada.
3 hrs. (lects. and seminars); one term
Prerequisite: Political Science 2G06.

POL SCI 3II3 ELECTIONS AND ELECTORAL BEHAVIOUR IN CANADA

A study of the development, nature and functioning of the electoral process in Canada and the basis of voters' decisions.
3 hrs. (lects. and seminars); one term
Prerequisite: Political Science 2G06.

POL SCI 3JJ3 PROVINCIAL POLITICS IN CANADA

A study of the development, nature and functioning of the political systems of the Canadian provinces.
3 hrs. (lects. and seminars); one term
Prerequisite: Political Science 2G06.

POL SCI 3KK6 MARX'S THOUGHT

A study of Marx through a reading of his writings from various stages in his development.
3 hrs. (lects. and seminars); two terms
Prerequisite: Political Science 2K06, or a course in Political Theory or Philosophy.

POL SCI 3LL6 THEORIES OF MASS SOCIETY

A careful study of a few books by writers who have looked at the possible tension between equality and liberty in the modern world and at the problem posed for constitutional democracy by 'mass' cultural and political phenomena.
3 hrs. (lects. and seminars); two terms
Prerequisite: One course in Political or Social Theory, and permission of the instructor.
Same as Sociology 3U06.

POL SCI 3M06 COMPARATIVE POLITICS: EASTERN EUROPEAN SYSTEMS

An analysis of the political ideologies, institutions, and practices of selected states of Eastern Europe (excluding the U.S.S.R.).
3 hrs. (lects. and seminars); two terms
Prerequisite: A course in Political Science.

POL SCI 3MM6 THE POLITICS OF MODERN AND CONTEMPORARY CHINA

An introduction to the political ideas, institutions and practices of mainland China and Taiwan in the period from 1911 to the present.
3 lects.; two terms
Prerequisite: A course in Comparative Politics; or permission of the instructor.

POL SCI 3NN6 PUBLIC LAW

A study of the nature and function of public law, with special reference to constitutional law and judicial behaviour.
3 hrs. (lects. and seminars); two terms
Prerequisite: Political Science 2G06.

POL SCI 3O06 MODERN POLITICAL THOUGHT

A critical analysis of modern political ideas, from the early nineteenth century to the present time, with special emphasis on the theories of modern conservatism, liberalism, socialism, fascism and democracy.
3 lects.; two terms
Prerequisite: Political Science 2O06 or Philosophy 1B06; or permission of the instructor.

POL SCI 3PP3 POLITICS IN GERMANY

A study of the development of the German political system, including analysis of political culture, ideological traditions, parties, elites and the policy process.
3 hrs. (lects. and seminars); one term
Prerequisite: A Political Science course beyond Level I.

POL SCI 3Q06 POLITICS IN JAPAN

An introductory survey of Japanese political institutions, ideas and practices, from ancient to modern times.
3 lects.; two terms
Prerequisite: A course in Comparative Politics; or permission of the instructor. Not open to students with credit in Political Science 2N06.
Offered in alternate years.

POL SCI 3QQ3 POLITICS IN FRANCE

A study of the development and functioning of the French political system, including analysis of political culture, ideological traditions, parties, elites and the policy process.
3 hrs. (lects. and seminars); one term
Prerequisite: A Political Science course beyond Level I.

POL SCI 3R03 DEMOCRACY AND POLITICAL CHANGE

An examination of the logical and historical connections between the idea of equality and both liberal and non-liberal forms of democracy.
2 lects.; one term
Prerequisite: A course in Political Theory.

POL SCI 3RR3 POLITICS IN ITALY

A study of the development and functioning of the Italian political system, including analysis of political culture, ideological traditions, parties, elites and the policy process.
3 hrs. (lects. and seminars); one term
Prerequisite: A Political Science course beyond Level I.

POL SCI 3S03 LOCAL GOVERNMENT AND POLITICS IN CANADA

A description of the laws and institutions of local government; examination of relationships with citizens and other levels of government; the dynamics of local politics.
3 hrs. (lects. and discussion); one term
Prerequisite: Political Science 2G06; or permission of the instructor.

POL SCI 3T03 MODERN POLAND 1863-1970

An examination of the development of Poland since the failure of the crucial rebellion of 1863-4. Emphasis will be on the struggle for national independence and on social and industrial modernization.

3 hrs. (lects. and discussion); one term

Prerequisite: History 1C06; or permission of the instructor.

Offered in alternate years.

Same as History 3FF3.

POL SCI 3U03 RESEARCH TECHNIQUES

A practical examination of topics in research design including questionnaire construction and interviewing procedures.

3 hrs. (lects.); one term

Prerequisite: Political Science 2F06. Not open to students with credit in Political Science 3U06.

POL SCI 3UU3 READING COURSE

Topics to be arranged between an individual student and instructor.

One term

Prerequisite: Registration in Level III or IV of any programme in Political Science, and the written permission of an Undergraduate Advisor on behalf of the Department. A written proposal must be submitted to the Department prior to the term in which the course is to be taken.

POL SCI 3V03 CULTURE AND POLITICS OF SOUTH ASIA

An introduction to the civilizations of the Indian sub-continent and a survey of social movements and political systems of contemporary south Asia.

3 lects.; one term

Prerequisite: A course in Political Science or Asian Studies

POL SCI 3VV3 CULTURE AND POLITICS OF THE MIDDLE EAST AND NORTHERN AFRICA

An introduction to the civilizations of the Middle East and Northern Africa, with special emphasis on Islamic culture and politics. Social movements and political systems of the more important states in the area will be surveyed.

3 lects.; one term

Prerequisite: A course in Political Science or Asian Studies.

POL SCI 3W03 POLITICS IN BRITAIN

A study of the development and functioning of the British political system, including political culture, political parties and parliamentary institutions.

3 hrs. (lects. and seminars); one term

Prerequisite: A course in Political Science or History 2N06.

Offered in alternate years.

POL SCI 3Y06 COMPARATIVE LEGISLATURES

An institutional and behavioural analysis of legislative bodies and executive-legislative relations in Canada, the United Kingdom, France, West Germany and the United States.

3 hrs. (lects. and seminars); two terms

Prerequisite: A Political Science course beyond Level I.

POL SCI 3Z06 PUBLIC ADMINISTRATION

An examination of the role of public administration in seeking collective solutions to common problems at all levels of government in Canada.

3 hrs. (lects. and seminars); two terms

Prerequisite: Political Science 2G06, and one other Political Science course beyond Level I.

POL SCI 4AA6 PROBLEMS IN AMERICAN POLITICS

An examination in depth of one of the important dimensions of the American political system.

3 hrs. (seminars); two terms

Prerequisite: Political Science 2B06; or permission of the instructor. A permission slip from the Department is required for registration in this course.

Offered in alternate years.

Enrolment is limited.

POL SCI 4BB6 THE TRIAL OF SOCRATES

Plato's understanding of the status of philosophy with respect to politics and rhetoric on the basis of the dialogues thematically connected to the trial and death of Socrates.

3 hrs. (seminars); two terms

Prerequisite: Registration in Level IV of any programme, and a course in Political Theory. A permisssion slip from the Department is required for registration in this course.

Enrolment is limited.

POL SCI 4CC3 SELECTED TOPICS ON THE STATE AND BUSINESS

This seminar will investigate topics concerning the relationship between state action and the organization and activities of the business community.

3 hrs. (seminars); one term

Prerequisite: Political Science 2G06, 2P06, 3X06, and 3Z06 are recommended. A permission slip from the Department is required for registration in this course.

Enrolment is limited.

POL SCI 4D06 COMPARATIVE STUDIES IN ETHNICITY AND POLITICS

A study of the impingement of the ethnic and racial factors upon the political process in comparative contexts, but focusing principally on South Africa.

3 hrs. (seminars); one term

Prerequisite: Previous course in Political Science. A permission slip is required from the Department for registration in this course.

Same as Sociology 4V06.

Enrolment is limited.

POL SCI 4DD6 CRITIQUES OF MARX'S THOUGHT

Specific topics in Marx's thought, such as class struggle, imperialism, crisis theory, the role of the state and others, will be evaluated in the light of contemporary criticism.

2 hrs. (seminar); two terms

Prerequisite: Political Science 3KK6; or permission of the instructor. A permission slip from the Department is required for registration in this course.

Enrolment is limited.

POL SCI 4E06 LIBERAL-DEMOCRATIC THEORY AND MARKET SOCIETY

This course seeks to trace the emergence and to assess the adequacy of the contemporary liberal-democratic theory of the welfare and regulatory state.

2-3 hrs. (seminars); two terms

Prerequisite: Registration in Level IV of any programme, and a course in Political Theory. A permission slip from the Department is required for registration in this course.

Enrolment is limited.

POL SCI 4F06 HUMAN RIGHTS: INTERNATIONAL AND NATIONAL

An examination of the concept of human rights as reflected in international and national declarations and practices. The focus will be on 'liberal' and 'Marxist-Leninist' interpretations and the specific content of human rights.

3 hrs. (seminar); two terms.

Prerequisite: Six units from International Relations courses, and six units from Comparative Politics courses. A permission slip from the Department is required for registration in this course.

Enrolment is limited.

POL SCI 4G06 COMPARATIVE PUBLIC POLICY

A critical analysis of the formation, content and impact of public policy within advanced industrial societies.

3 hrs. (seminar); two terms.

Prerequisite: A previous course in Comparative or Canadian Politics. Not open to students with credit in Political Science 3X06. A permission slip from the Department is required for registration in this course.

Enrolment is limited.

POL SCI 4J06 COMPARATIVE POLITICS: COMMUNIST POLITICAL SYSTEMS

A comparative analysis of the political ideologies, institutions and practices of communist political systems.

Seminar; two terms

Prerequisite: Six units of Level II or Level III Comparative Politics courses; or permission of the instructor. A permission slip from the Department is required for registration in this course.

Enrolment is limited.

Offered in alternate years.

POL SCI 4K06 ADVANCED TOPICS IN PUBLIC ADMINISTRATION

An examination in depth of one or more of the important topics, problems, or perspectives in the study of public administration.

3 hrs. (seminar); two terms.

Prerequisite: Political Science 3Z06; open only to Level IV students. A permission slip from the Department is required for registration in this course.

Enrolment is limited.

POL SCI 4M06 ISSUES IN INTERNATIONAL POLITICS

An examination of selected topics in international politics and foreign policy.

2 hrs. (seminars); two terms

Prerequisite: Registration in Level IV of any programme, and a course in International Relations. A permission slip from the Department is required for registration in this course.

Enrolment is limited.

POL SCI 4O06 CANADIAN PUBLIC POLICY

An examination of the patterns of public policy in Canada and a critical evaluation of several types of explanation.

Seminar (3); two terms

Prerequisite: Political Science 2G06, and another course in Political Science beyond Level I. Open only to Level IV students. A permission slip from the Department is required for registration in this course.

Enrolment is limited.

POL SCI 4P03 COMPARATIVE POLITICAL PARTIES

An examination of the role of political parties in various societies, and a critical evaluation of approaches to study them. The focus will be primarily on Western political systems.

3 hrs. (seminar); one term

Prerequisite: A course in Comparative or Canadian Politics. A permission slip from the Department is required for registration in this course.

Enrolment is limited.

POL SCI 4Q06 POLITICAL SYSTEMS OF DEVELOPING AREAS

An examination of the social movements and political systems of the non-Western less-developed areas of the world. Consideration is given to techniques of analysis and to theories of modernization and development as applied to 'Third World' countries.

3 hrs.; two terms

Prerequisite: Twelve units of Level II and III Political Science courses; or permission of the instructor. A permission slip from the Department is required for registration in this course.
Enrolment is limited.

POL SCI 4S06 CANADIAN POLITICAL THEORY
An investigation into the character of Canadian liberalism and the various critiques of liberalism found in the works of G.P. Grant, C.B. Macpherson, George Woodcock and other Canadian political theorists.
3 hrs. (seminar); two terms
Prerequisite: Two courses from Political Theory, Canadian Politics, or Philosophy; or permission of the instructor. A permission slip from the Department is required for registration in this course.
Enrolment is limited.

POL SCI 4U06 PROBLEMS OF POLITICAL PHILOSOPHY
A study in detail and in depth of writings by a limited number of political thinkers, focussing upon one of the central problems of political philosophy.
2 hrs. (seminars); two terms
Prerequisite: A course in Political Theory. A permission slip from the Department is required for registration in this course.
Enrolment is limited.

POL SCI 4W06 QUEBEC POLITICS
The political ideology of Quebec-based parties and movements, the impact of industrialization upon Quebec culture, and the economic implications of separatism.
3 hrs. (seminar); two terms
Prerequisite: Political Science 2G06, and another Political Science course beyond Level I. A permission slip from the Department is required for registration in this course.
Enrolment is limited.

POL SCI 4Z06 HONOURS ESSAY
A major piece of scholarly writing designed to cap the undergraduate Honours programme in Political Science. The subject matter is to be different from that covered in 4I06, if the student is enrolled in both courses.
Two terms
Prerequisite: Registration in Level IV of any Honours programme in Political Science. For registration in the summer, written permission of the Course Coordinator is also required.

For **Graduate Courses**, see *Calendar of School of Graduate Studies.*

Psychology

Faculty as of January 15, 1989

L. G. Allan/*Chairman*

Professor Emeritus

Bernard R.W. Heron/M.A., Ph.D. *(McGill)*

Professors

Lorraine G. Allan/B.A., M.A. *(Toronto)*, Ph.D. *(McMaster)*
Ian M. Begg/B.A., M.A., Ph.D. *(Western)*
Lee R. Brooks/A.B. *(Columbia)*, M.S., Ph.D. *(Brown)*
D. William Carment/B.A. *(Saskatchewan)*, M.A., Ph.D. *Toronto)*
Martin Daly/B.A. *(Toronto)*, M.A. *(McGill)*, Ph.D. *(Toronto)*
Bennett G. Galef/A.B. *(Princeton)*, M.A., Ph.D. *(Pennsylvania)*
Larry L. Jacoby/B.A. *(Washburn)*, M.A., Ph.D. *(Southern Illinois)*
Herbert M. Jenkins/A.B. *(Oberlin)*, Ph.D. *(Harvard)*
Alfred B. Kristofferson/B.S., M.A., Ph.D. *(Michigan)*
Betty A. Levy/B.A. *(Dalhousie)*, M.A., Ph.D. *(Toronto)*
Stephen W. Link/B.A. *(Colorado)*, Ph.D. *(Stanford)*
Daphne M. Maurer/B.A. *(Swarthmore)*, M.A. *(Pennsylvania)*, Ph.D. *(Minnesota)*
G. Rolfe Morrison/B.Sc., M.Sc. *(McGill)*, Ph.D. *(Brown)*
P. Lynn Newbigging/B.A. *(Saskatchewan)*, M.A. *(Toronto)*, Ph.D. *(London)*
John R. Platt/B.A. *(Kansas)*, Ph.D. *(Texas)*
Roy M. Pritchard/B.Sc., Ph.D. *(Reading)*
Ronald J. Racine/B.Sc. *(Oregon)*, M.Sc., Ph.D. *(McGill)*
Larry E. Roberts/B.A., Ph.D. *(Minnesota)*
Shepard Siegel/A.B. *(New York)*, M.S., Ph.D. *(Yale)*
Grant K. Smith/B.Sc., Ph.D. *(McGill)*

Associate Professors

Denys deCatanzaro/B.A., M.A. *(Carleton)*, Ph.D. *(British Columbia)*
Harvey Weingarten/B.Sc. *(McGill)*, M.S., M. Phil, Ph.D. *(Yale)*

Assistant Professors

Richard B. Day/B.A. *(Massachusetts)*, M.A. *(Iowa)*, Ph.D. *(McMaster)*
Paula J. Durlach/B.A. *(Swarthmore)*, M.S., Ph.D. *(Yale)*
Craig W. Hawryshyn/B.Sc. *(Manitoba)*, M.Sc. *(Alberta)*, Ph.D. *(Waterloo)*

Associate Members

Arthur Cott/ (Medicine), B.Sc. *(McMaster)*, Ph.D. *(Syracuse)*
Marianne W. Kristofferson/ (Psychiatry) B.A., Ph.D. *(Cincinnati)*
Christopher David Rollo/ (Biology), B.Sc., M.Sc. *(Guelph)*, Ph.D. *(British Columbia)*
Ellen B. Ryan/ (Psychiatry) B.A., M.A. *(Brown)* Ph.D. *(Michigan)*
Sandra F. Witelson/ (Psychiatry), B.Sc., M.Sc., Ph.D. *(McGill)*

Department Notes:

1. The University reserves the right to limit enrolment in any course. Where priorities have to be established, first consideration will be given to Honours B.Sc. and Honours B.A. Psychology students.
2. Registration in all courses marked ★★ listed as selected topics, independent research, individual readings and honours essays requires written permission of the Department. Registration with appropriate permission must be completed no later than the last day for registration as stated in the Calendar under *Sessional Dates.*

PSYCH 1A06 GENERAL PSYCHOLOGY
A broad survey of the subject matter of psychology. Topics covered include physiological psychology, perception, learning, animal behaviour, development, cognition, psychopathology and social psychology.
3 hrs. (lects. and tuts.); two terms
Prerequisite: Open.

PSYCH 2A03 THEORIES OF HUMAN DEVELOPMENT
A general survey of human development with an emphasis on the childhood years.
3 lects.; one term
Prerequisite: Psychology 1A06. Not open to students who have credit for, or are registered in, Psychology 3G03 or 3M06.

PSYCH 2B03 PERSONALITY
An introduction to the scientific study of personality which will consider theory, assessment and research in five approaches to personality: psychodynamic, biological, trait, behavioural and humanistic.
3 lects.; one term
Prerequisite: Psychology 1A06.

PSYCH 2C03 INTRODUCTION TO SOCIAL PSYCHOLOGY
An overview of research and theory in areas such as social perception, attitude and attitude change, social influence, interpersonal attraction, altruism, aggression, small group processes.
2 lects., 1 tut.; one term
Prerequisite: Psychology 1A06.

PSYCH 2E03 SENSORY PROCESSES
General processes mediating sensation and perception. Topics include neural principles of sensory pathways, the measurement of perception and the role of sensory processes in behaviour.
3 lects.; one term
Prerequisite: Psychology 1A06.

PSYCH 2G03 PSYCHOLOGICAL STATISTICS
An introduction to descriptive statistics and to the logic of statistical inference. This course is intended to provide an understanding of statistical procedures commonly found in the psychological literature.
3 lects.; one term
Prerequisite: Mathematics 1L03, or any other 3 units of Level I Mathematics, and registration in B.A. Psychology. Not open to students who are registered in, or have received credit for, Mathematics 1F06, or Psychology 2R06, or Statistics 2R06, or equivalent.

PSYCH 2H03 HUMAN LEARNING AND COGNITION
The psychological study of knowledge and how people use it. Topics include pattern recognition, remembering and reasoning.
3 lects., one term
Prerequisite: Psychology 1A06.

PSYCH 2R06 RESEARCH DESIGN AND STATISTICS FOR PSYCHOLOGISTS
Statistical principles in the design and analysis of experiments in psychology. Parametric and non-parametric techniques for single sample, two sample and multisample designs.
3 lects.; two terms
Prerequisite: One of Mathematics 1A06, 1F06, 1M03, 1N06 and registration in a Psychology programme. Not open to students who have completed Statistics 2D03, 2D04, 2M03, 2R06 or 3N03.
A student receiving credit for Psychology 2G03 may receive only three additional units credit for Psychology 2R06.

PSYCH 2T03 PRINCIPLES OF CONDITIONING

An experimental survey of conditioning processes based on the study of animal behaviour.

3 lects.; one term

Prerequisite: Psychology 1A06.

PSYCH 2W06 NEUROPSYCHOLOGY

Neural organization and the relationship between human brain function and behaviour.

3 lects.; two terms

Prerequisite: Psychology 1A06.

PSYCH 3A03 AUDITION

An introduction to auditory perception. The emphasis is on the application of classical and modern psychoacoustical methods to the development of theories of hearing.

3 lects.; one term

Prerequisite: Registration in Honours or B.Sc. Psychology; or permission of the instructor

PSYCH 3B03 PSYCHOPATHOLOGY

Assessment, etiology and treatment of abnormal human behaviour. Content may include a general study of childhood psychopathology or a detailed examination of a specific psychopathology.

3 lects.; one term

Prerequisite: Credit, or registration in Psychology 3N06; or permission of the instructor.

PSYCH 3C06 SOCIAL PSYCHOLOGY LABORATORY

Students collect, analyse and interpret data, and in the second term carry out a research project of their own design.

2 lects., 1 lab. (3); two terms

Prerequisite: Permission of the department which must be obtained by March 1, and Psychology 2C03, and Psychology 2R06 or Statistics 2R06; or permission of the instructor.

Enrolment is limited.

PSYCH 3D03 SELECTED TOPICS IN SOCIAL PSYCHOLOGY

Topics will include cross-cultural communication and inter-group relations.

3 lects.; one term

Prerequisite: Psychology 2C03.

Not offered in 1989-90.

PSYCH 3DD3 PSYCHOLOGICAL ASPECTS OF AGING

An examination of the cognitive and social-psychological aspects of aging: sensation, perception, attention, memory, intelligence, communication, personality, attitudes and mental health.

3 hrs. (lects. and seminar); one term

Prerequisite: Psychology 1A06 and Gerontology 1A06 or Social Science 2G06; or permission of the instructor.

Same as Gerontology 3D03.

Students in a Psychology programme (except those in Gerontology and Psychology) must register for this course as Psychology 3DD3.

PSYCH 3E03 AUDITION LABORATORY

Experimental investigation of the role of auditory processes in the perception of music. The emphasis is on all phases of experimentation including report writing.

1 lab. (3); one term

Prerequisite: Permission of the department which must be obtained by March 1, and Psychology 3A03, and Psychology 2R06 or Statistics 2R06; or permission of the instructor.

Enrolment is limited.

PSYCH 3F06 PHYSIOLOGICAL PSYCHOLOGY I

Topics include membrane physiology, neurochemistry, sensory and motor functions, and the physiology of motivation, learning, and memory. Designed particularly for students in the Faculty of Science.

3 lects.; two terms

Prerequisite: Registration in Honours or B.Sc. Psychology, or registration in Level III or IV of a Biology or Biochemistry programme; or permission of the instructor.

PSYCH 3G03 DEVELOPMENT DURING INFANCY

Social and cognitive development in the first two years of life. Topics include fetal development, development of perception, memory and concepts.

3 lects.; one term

Prerequisite: Registration in Level III or IV of a Psychology programme; or permission of the instructor. Not open to students with credit in Psychology 3M06.

PSYCH 3H03 INTELLECTUAL DEVELOPMENT AFTER INFANCY

The development of perception, memory, language and concepts after infancy.

3 lects.; 1 term

Prerequisite: Psychology 3G03, and completion of or registration in Psychology 2G03 or 2R06. Not open to students with credit in Psychology 3M06.

PSYCH 3K03 PSYCHOLOGICAL MEASUREMENT

Theory of psychological testing and measurement. Topics include the statistical bases and assumptions of measurement, test validity and reliability and the measurement of human characteristics.

3 lects.; one term

Prerequisite: Psychology 1A06, and Psychology 2G03, or 2R06 or Statistics 2R06; or permission of the instructor. Students with grades less than B− in Psychology 2G03 are advised not to enroll in this course.

PSYCH 3L03 LABORATORY IN ANIMAL CONDITIONING

Students undertake experimental exercises intended to demonstrate principles of simple learning. Experiments are conducted at times of the student's choosing within normal hours of operation.

Tuts., lab. by appointment; one term

Prerequisite: Psychology 2T03 and permission of the department which must be obtained by March 1. Not open to students with credit in Psychology 2U03.

Enrolment is limited.

PSYCH 3N06 ABNORMAL PSYCHOLOGY

Topics basic to clinical psychology, including models of behavioural disorder, classification of abnormal behaviour, evaluation of diagnostic practice, and determinants and treatment of mental illness.

3 lects.; two terms

Prerequisite: Credit or registration in one of Psychology 2T03, 2W06, or 3F06; or registration in Level III or IV of Nursing; or permission of the instructor.

PSYCH 3P03 PSYCHOLOGICAL TOPICS IN THINKING

Areas to be covered include human inference, decision making, and creative problem solving.

3 lects.; one term

Prerequisite: Psychology 2H03.

PSYCH 3Q03** INDIVIDUAL STUDY I

A library project that may extend over both terms. Students intending to register must first consult a faculty member and the course co-ordinator.

Prerequisite: Permission of the course co-ordinator. Not open to students who are registered in, or who have received credit for Psychology 3QQ3.

PSYCH 3QQ3** INDIVIDUAL LAB STUDY I

A laboratory project that may extend over both terms. Students intending to register must first consult a faculty member and the course coordinator.

Prerequisite: Permission of the course coordinator. Not open to students who are registered in, or who have received credit for, Psychology 3Q03.

PSYCH 3R03 INTRODUCTION TO ANIMAL BEHAVIOUR

The development, stimulus control, and function of behaviour as seen in evolutionary perspective. Instinctive behaviour, learned behaviour, and their interactions.

3 lects.; one term

Prerequisite: Registration in a Psychology programme, or in a four-level programme in Biochemistry or Biology; or permission of the instructor.

PSYCH 3S03 ANIMAL BEHAVIOUR LABORATORY

Experiments involving a wide variety of animal species, both vertebrate and invertebrate.

1 lab. (3); one term

Prerequisite: Permission of the department which must be obtained by March 1, and Psychology 3R03, and registration in a four-level programme in Psychology or Biology; or permission of the instructor.

Enrolment is limited.

PSYCH 3T03 SOCIOBIOLOGY

Social behaviour of people and other animals from the perspective of evolutionary theory. Topics include aggression, altruism, kinship, parent-offspring interaction, sex and reproduction.

3 lects.; one term

Prerequisite: One of Anthropology 2D03, 2E03, Biology 2C03, 3J03, Psychology 3R03.

PSYCH 3U03 HUMAN MEMORY

Cognitive processes involved in encoding, storage and retrieval will be discussed in terms of current theories of memory and information processing.

3 lects.; one term

Prerequisite: Psychology 2H03 and registration in Level III or IV of a Psychology programme; or permission of the instructor.

PSYCH 3V03 LABORATORY IN HUMAN MEMORY AND COGNITION

Experiments illustrating important issues in human memory and cognition. Problems in the design, analysis, and reporting of experiments will be emphasized. Individual projects required.

1 lab. (3 hrs.); one term

Prerequisite: Permission of the department which must be obtained by March 1, and Psychology 3U03, and credit or registration in Psychology 2R06 or Statistics 2R06.

Enrolment is limited.

PSYCH 3W06 PSYCHOPHYSICS AND PERCEPTION

Theories, methods, and data of psychophysics are presented and used in the analysis of sensation, perception, and cognition. Quantitative theories and data are

stressed, but phenomenology is considered.
3 lects.; two terms
Prerequisite: Credit or registration in Psychology 2G03 or 2R06, or Statistics 2R06; or permission of the instructor.

PSYCH 3X03 SELECTED TOPICS IN BEHAVIOUR MODIFICATION
Major issues and controversies in contemporary behaviour modification. Consideration is given to rival theoretical accounts, and to experimental bases for such techniques as systematic desensitization, aversion therapy, and punishment.
3 lects.; one term
Prerequisite: Psychology 2T03, and registration in a Psychology programme; or permission of the instructor.

PSYCH 3Y03 SELECTED TOPICS IN BEHAVIOUR THEORY
Issues of contemporary interest in animal learning and behaviour will be examined in depth.
3 lects.; one term
Prerequisite: Psychology 2T03, and registration in a Psychology programme; or permission of the instructor.
Psychology 3Y03 may be repeated, for a total of six units credit, if on a different topic and with permission of the instructor.

PSYCH 3Z03 RESEARCH METHODS IN PSYCHOLOGY
An advanced course examining the principles and techniques of research and data analysis in psychology.
3 lects.; one term
Prerequisite: Psychology 2R06, and registration in Honours Psychology. Not open to students registered in, or with credit in, Biology 3T03.

PSYCH 4A03 CONTEMPORARY TOPICS IN HISTORICAL PERSPECTIVE
Discussion of the background and current status of several issues of contemporary interest.
3 hrs. (lects. and seminar); one term
Prerequisite: Registration in Level IV Honours Psychology or Level IV Major Psychology with a CAA of at least 7.0; or permission of the instructor.

PSYCH 4B03 HISTORY OF PSYCHOLOGY
An historical account of the main lines of development of psychology.
3 lects.; one term
Prerequisite: Registration in Level IV Honours Psychology or Level IV Major Psychology with a CAA of at least 7.0; or permission of the instructor.

PSYCH 4D06 PSYCHOLOGY THESIS
Students conduct research projects with individual faculty members. Three copies of a completed thesis must be submitted by the end of classes.
Prerequisite: Registration in Level IV Honours Psychology, and permission of the course co-ordinator, which must be obtained by March 1. If Psychology 3Q03, 3QQ3, 4Q03, or 4QQ3 is taken concurrently with Psychology 4D06, a different faculty member must supervise each course.

PSYCH 4F03 NEURAL MECHANISMS I
Neurobiology at an advanced level. Topics include membrane biophysics, electrophysiology and pharmacology of excitable cells, synaptic and dendritic mechanisms and neural plasticity.
3 lects.; 1 term
Prerequisite: Psychology 3F06 or Biology 3U06, and registration in Level IV of Honours Psychology, Biology or Biology/Psychology or Level IV Major Psychology with a CAA of at least 7.0; or permission of the instructor. Not open to students who have completed Psychology 4E07.

PSYCH 4G03 NEURAL MECHANISMS II
Seminars and laboratory experience in current problems in neurobiology.
2 hrs. seminar, 3 hrs. lab.; one term
Prerequisite: Permission of the Department which must be obtained by March 1, and Psychology 4F03; or permission of the instructor. Not open to students who have completed Psychology 4E07.
Enrolment is limited.

PSYCH 4H03 PHYSIOLOGICAL PSYCHOLOGY II
A critical examination of current issues in physiological psychology.
3 hrs. (lect. or seminar); one term
Prerequsite: Psychology 3F06, and registration in Level IV Honours Psychology or Biology/Psychology or Level IV Major Psychology with a CAA of at least 7.0; or permission of the instructor.

PSYCH 4Q03** INDIVIDUAL STUDY I
A library project that may extend over both terms. Students intending to register must first consult a faculty member and the course co-ordinator.
Prerequisite: Permission of the course co-ordinator. Open only to students in Level IV of an Honours Psychology programme or Level IV Major Psychology with a CAA of at least 7.0. Not open to students who are registered in, or who have received credit for, Psychology 4QQ3.

PSYCH 4QQ3** INDIVIDUAL STUDY II
A laboratory project that may extend over both terms. Students intending to register must first consult a faculty member and the course co-ordinator.
Prerequisite: Permission of the course co-ordinator. Open only to students in Level IV of an Honours Psychology programme. Not open to students who are registered in, or who have received credit for, Psychology 4Q03.

For **Graduate Courses** see *Calendar of School of Graduate Studies.*

Religious Studies

Faculty as of January 15, 1989

J. Robertson/ *Chairman*

Professors Emeriti

John G. Arapura/B.A. *(Serampore College, and Bishop's College, Calcutta)*, S.T.M. *(Union Theological Seminary)*, M.A., Ph.D. *(Columbia)*
Johannis J. Mol/B.D. *(Union Theological Seminary)*, M.A., Ph.D. *(Columbia)*
Yun-hua Jan/M.A., Ph.D. *(Visva-Bharati)*
Krishna Sivaraman/M.A. *(Annamalai, Madras)*, Ph.D. *(Banaras)*

Professors

A. Eugene Combs/B.A. *(Trinity, San Antonio)*, M.Div. *(Union Theological Seminary)*, Ph.D. *(Columbia)*
Phyllis Granoff/B.A. *(Radcliffe College)*, Ph.D. *(Harvard)*
David R. Kinsley/B.A. *(Drew)*, B.D. *(Union Theological Seminary)*, M.A., Ph.D. *(Chicago)*
Ben F. Meyer/B.A. *(Gonzaga, Spokane)*, Ph.L. *(Mount St. Michael's, Spokane)*, M.A. *(Gonzaga)*, M.S.T. *(Santa Clara)*, S.T.L. *(Alma, Los Gatos)*, S.S.L. *(Istituto Biblico)*, S.T.D. *(Gregorian)*
John C. Robertson/B.A. *(Texas Wesleyan College)*, B.D. *(Southern Methodist)*, S.T.M., M.A., Ph.D. *(Yale)*
Gérard Vallée/B.A. *(Laval)*, M.A. *(Montreal)*, Ph.D. *(Münster)*
Paul Younger/A.B. *(LaFayette)*, M.A. *(Banaras)*, B.D. *(Serampore)*, Th.M., M.A., Ph.D. *(Princeton)*

Associate Professors

Louis I. Greenspan/M.A. *(Dalhousie)*, Ph.D. *(Brandeis)*
Alan Mendelson/A.B. *(Kenyon College)*, M.A. *(Brandeis)*, Ph.D. *(Chicago)*
Koichi Shinohara/B.L., M.L. *(Tokyo)*, Ph.D. *(Columbia)*
Wayne K. Whillier/B.A. *(Sir George Williams)*, Ph.D. *(McMaster)*

Assistant Professors

Ellen Badone/B.A., M.A. *(Toronto)*, Ph.D. *(California, Berkeley)*
Graeme MacQueen/B.A., M.A. *(McMaster)*, Ph.D. *(Harvard)*
Adele Reinhartz/B.A. *(Toronto)*, M.A., Ph.D. *(McMaster)*
S.R. Westerholm/B.A., M.A. *(Toronto)*, D.Th. *(Lund)*

Lecturers

P. Travis Kroeker/B.A. *(Winnipeg)*, B.R.S. *(Mennonite College)*, M.A. *(Toronto)*
Zdravko Planinc/B.A., M.A. *(York)*, A.M. *(Harvard)*

Department Notes:

1. Students are advised to consult the Department's Handbook, which will be available prior to registration, for a list of the courses offered in the current year.
2. Registration in all courses marked ** listed as selected topics, independent research, individual readings and honours essays requires written permission of the Department. Registration with appropriate permission must be completed no later than the last day for registration as stated in this Calendar under *Sessional Dates.*
3. The course list is divided by Level. The Advanced Study courses are at the end of the list. Level IV Honours students are normally expected to register for at least 6 units of Advanced Study (Religious Studies 4AA6, 4BB6, 4CC6, 4DD6, 4EE6, 4I06, 4W06, 4Y03). The format of these courses varies from year to year, but they are usually either seminars or reading courses. Students should plan their programme in consultation with the instructors of the Honours seminar and a Departmental Undergraduate Advisor.

RELIG ST 1B06 WORLD RELIGIONS
A comparative study of religions such as Hinduism, Buddhism, Islam, Christianity, and Judaism with special reference to selected texts, traditions and thought.
2 lects., 1 tut.; two terms
Prerequisite: Open.

RELIG ST 1D06 MODERN STUDY OF THE BIBLE
An introduction to the discipline of modern biblical criticism focusing on the development of selected central themes.
2 lects., 1 tut.; two terms
Prerequisite: Open.

RELIG ST 1E06 IDEAS OF LOVE
This course will discuss the variety of accounts of love in Western civilization from the time of the ancient Greeks and the rise of Christianity to modernity.
2 lects., 1 tut.; two terms
Prerequisite: Open.

RELIG ST 1F06 WAR AND THE PROBLEM OF MEANING
This course uses lectures, films, and selected writings from religion, politics and literature to examine, in a comparative manner, the ways in which different traditions have understood the meaning and end of war.
2 lects., 1 tut.; two terms
Prerequisite: Open.

RELIG ST 1H03 RELIGIOUS REVITALIZATION AND DISSENT
A study of recent dissent from establishment religion. Feminist thought and liberation theology will be examined.
2 lects., 1 tut.; one term
Prerequisite: Open.

RELIG ST 2A06 DEATH AND DYING IN HUMAN EXPERIENCE
A reflection on death as a problem and a mystery in light of both contemporary knowledge and selected religious literature.
2 lects., 1 tut.; two terms
Prerequisite: Open.

RELIG ST 2AA3 MYSTICISM IN HINDU AND CHRISTIAN TRADITIONS
An exploration of the unique and common characteristics of mysticism in the Hindu and Christian traditions, both in its philosophical and popular expression through the study of selected texts.
2 lects., 1 tut.; one term
Prerequisite: Open.

RELIG ST 2BB3 IMAGES OF THE DIVINE FEMININE
An examination of goddesses and religious heroines from a variety of cultures: tribal, eastern and western.
2 lects., 1 tut.; one term
Prerequisite: Open.

RELIG ST 2C03 MORAL ISSUES
An introduction to moral philosophy accenting biomedical ethics. Issues such as abortion, human experimentation, euthanasia, and genetic screening will be investigated in cooperation with members of the Faculty of Health Sciences.
2 lects., 1 tut.; one term
Prerequisite: Open to students in Level II and above.
Same as Philosophy 2D03.

RELIG ST 2CC3 SPECIALISTS IN THE SACRED
A study of common religious types: shamans, mystics, priests, and saints, and an attempt to discern their distinctive characteristics.
2 lects., 1 tut.; one term
Prerequisite: Open.

RELIG ST 2D06 THE BIBLICAL WORLD: AN INTRODUCTION TO THE BACKGROUND OF THE OLD TESTAMENT
The social and political world of the Old Testament period (second millenium to 300 B.C.E.). Special attention will be given to the nature of the physical environment and to the results of archaeology.
2 lects., 1 tut.; two terms
Prerequisite: Open.

RELIG ST 2DD3 THE FIVE BOOKS OF MOSES
The central teachings of the Pentateuch (Genesis-Deuteronomy) in the religious life and history of ancient Israel and in Western thought.
2 lects., 1 tut.; one term
Prerequisite: Open. For a study of the whole Hebrew Bible, Religious Studies 2D06, 2DD3, 2EE3, 3M03 are recommended.

RELIG ST 2E06 INTRODUCTION TO THE STUDY OF THE NEW TESTAMENT
A survey of early Christian history and New Testament literature. Attention is paid to the Jewish background to Christianity and to the contemporary Jewish and Hellenistic worlds.
2 lects., 1 tut.; two terms
Prerequisite: Open. Students with credit in Religious Studies 2G06 may not take this course for credit.

RELIG ST 2EE3 THE PROPHETS
The role and teaching of biblical prophets in their ancient setting and their impact on modern religious life and thought.
2 lects., 1 tut.; one term
Prerequisite: Open.

RELIG ST 2F03 THE SPREAD OF CHRISTIANITY
A study of the historical reasons why Christianity emerged as the religion which satisfied the quest for salvation in the early centuries of the Christian era.
2 lects., 1 tut.; one term
Prerequisite: Open.

RELIG ST 2FF6 HISTORY OF ANCIENT JUDAISM
A study of Judaism from the Babylonian Exile through the Rabbinic Period, with emphasis on the growth of religious movements and the political status of Jews and Judaism.
2 lects., 1 tut.; two terms
Prerequisite: Open.

RELIG ST 2H03 ISSUES IN WAR AND PEACE
Religious thinking and practice on militarism, the restraint of war and paths to peace, including just war, nonviolence, pacifism and revolution.
2 lects., 1 tut.; one term
Prerequisite: Open.

RELIG ST 2HH3 THE GREEK GODS
This course examines the accounts of the gods given in some of the most important ancient Greek religious texts. Each year a few selected texts will be selected from the works of Homer, the Pre-Socratics, the tragedians and Plato for close study and discussion.
2 lects., 1 tut.; one term
Prerequisite: Open.

RELIG ST 2I03 RELIGION AND SOCIAL JUSTICE
An examination of conceptions of justice in modern society and their relationship to religious understandings of human nature and society, with attention to issues such as economic distribution, human rights, criminal law, and enviromental policy.
2 lects., 1 tut,; one term
Prerequisite: Open.

RELIG ST 2II3 CHRISTIANITY IN THE PATRISTIC PERIOD (100-800)
The development of Christianity in the first centuries C.E. in relation to competing alternatives such as Judaism, Graeco-Roman cults and philosophies.
2 lects., 1 tut.; one term
Prerequisite: Open. Students with credit in Religious Studies 2HH6 or Religious Studies 2II3F may not take this course for credit.
Not offered in 1989-90.

RELIG ST 2J06 INDIA: ITS CULTURE, SOCIAL HISTORY, RELIGION AND PHILOSOPHY
A systematic study of the intellectual and spiritual traditions of India. The course will include political, economic and social thought, as well as religion and philosophy.
2 lects., 1 tut.; two terms.
Prerequisite: Open. Students with credit in Religious Studies 2O06 may not take this course for credit.

RELIG ST 2JJ3 CHRISTIANITY IN THE MEDIEVAL PERIOD (800-1500)
The development of Christianity in the Middle Ages and its relation to the political and intellectual context. Primary texts will illustrate typical aspects of medieval religion, learned and popular.
2 lects., 1 tut.; one term
Prerequisite: Open. Students with credit in Religious Studies 3KK3 may not take this course for credit.
Not offered in 1989-90.

RELIG ST 2K03 MYTH
Major definitions and theories of myth are discussed in conjunction with primary readings from mythological texts.
2 lects., 1 tut.; one term
Prerequisite: Open.
Same as Anthropology 2KK3.

RELIG ST 2KK3 CHRISTIANITY IN THE 16TH CENTURY
The place of the Reformation movement in the development of Christianity, its background, context and sequels. Attention given to the life and thought of Martin Luther and his impact on Western culture.
2 lects., 1 tut.; one term
Prerequisite: Open. Students with credit in Religious Studies 3QQ3 may not take this course for credit.

RELIG ST 2L03 LIFE, WORK AND TEACHINGS OF MAHATMA GANDHI
A study of the central religious and ethical ideas of Gandhi in the context of his life; in particular: his doctrines of Non-violent Struggle and Truth-act; his place in contemporary consciousness, particularly in the struggle for human harmony and preservation of the earth and its living species; and his revolutionary view of Truth itself as God.
2 lects., 1 tut.; one term
Prerequisite: Open.

RELIG ST 2LL3 CHRISTIANITY AFTER 1600
The development of Christianity (Protestant and Catholic) from the 17th to the 20th centuries. Attention is given to the interaction between secular and religious movements, and to Christianity's reaction to world-wide challenges.
2 lects., 1 tut.; one term
Prerequisite: Open.

RELIG ST 2MM6 EAST ASIAN RELIGIONS
An introduction to Chinese religion and philosophy from early periods to the present. The course will treat Confucianism, Taoism, Buddhism, and Western influences on China.
2 lects., 1 tut.; two terms
Prerequisite: Open. Students with credit in Religious Studies 2O06 may not take this course for credit.

RELIG ST 2PP3 INDIAN PHILOSOPHY
An introduction to the basic assumptions of Indian philosophy incorporating traditional stories as illustrative of important philosophical concepts.
2 lects., 1 tut.; one term
Prequisite: Open. Students with credit in Religious Studies 3P03 or 3P06 may not take this course for credit.

RELIGIOUS STUDIES

RELIG ST 2QQ3 CULTS IN NORTH AMERICA
An examination of new religious movements that have become prominent in North America. The Hare Krishna Movement, the Unification Church, and Scientology will be covered. The brainwashing and deprogramming controversy will be studied.
2 lects., 1 tut.; one term
Prerequisite: Open.

RELIG ST 2R06 DIVINE JUSTICE
A study of the concept of the just God and the problem of evil with primary reference to the treatment of the issue in biblical, classical and modern thought.
2 lects., 1 tut.; two terms
Prerequisite: Open. Students with credit in Religious Studies 2R03 may not take this course for credit.

RELIG ST 2RR3 RELIGIOUS THOUGHT IN THE NOVELS OF TOLSTOY AND DOSTOYEVSKY
A critical examination of the treatment of religious thought in the major novels of Tolstoy and Dostoyevsky.
3 lects.; 1 term
Prerequisite: Open to students in Level II and above.
Offered in alternate years.
Same as Russian 2RR3.

RELIG ST 2S06 POST HOLOCAUST JUDAISM
Contemporary Jewish reflections on the tradition, on the holocaust, on Zionism, and the Jewish condition.
2 lects., 1 tut.; two terms
Prerequisite: Open. Students with credit in Religious Studies 3M06 may not take this course for credit.

RELIG ST 2SS3 WOMEN AND RELIGION
A study of the status and roles of women in several religions, such as Hinduism, Buddhism, Confucianism, Christianity, Judaism, and Islam. Important women religious figures and feminist theology will also be studied.
2 lects., 1 tut.; one term
Prerequisite: Open.

RELIG ST 2T03 YOGA: THEORY AND PRACTICE
A study of both the theoretical and practical sides of Yoga, beginning with the famous aphorisms of Patanjali; its importance and relevance for today.
2 lects., 1 tut.; one term
Prerequisite: Open. Students with credit in Religious Studies 3WW3 may not take this course for credit.

RELIG ST 2VV3 BIBLICAL LITERATURE
A survey introduction to biblical literature (Old Testament, New Testament, and selected Apocrypha and Pseudepigraphica) and the history of biblical interpretation to meet the particular needs of students of Western literature.
2 lects., 1 tut.; one term
Prerequisite: Open.
Same as Comparative Literature 2G03.

RELIG ST 2WW3 HEALTH, HEALING AND RELIGION
An examination of the different ways in which religion and health are related. Ideas of sickness and techniques of healing will be studied in a variety of traditional and modern religious contexts.
2 lects., 1 tut.; one term
Prerequisite: Open.

RELIG ST 2X03 GREEK AND ROMAN BACKGROUND TO EARLY CHRISTIANITY
A description and analysis of selected Greek and Roman social and political institutions which helped to form the background to the life of early Christians and the New Testament writers. The topics surveyed include: the spread of the Greek language and culture, Roman provincial government and the Roman army, travel by land and sea, the life of major cities, education and literature.
3 lects.; one term
Prerequisite: Open.
Same as Classical Civilization 2X03.

RELIG ST 2XX6 RELIGIOUS FOUNDATIONS OF HUMAN ORDER, EAST AND WEST
A close and comparative study of selected religious texts in order to discern their teachings about the proper ordering of human beings.
2 lects., 1 tut.; two terms
Prerequisite: Open. Students with credit in Religious Studies 1C06 may not take this course for credit.
Not offered in 1989-90.

RELIG ST 2Y03 PSYCHOLOGY OF RELIGION
An examination of certain psychological understandings of religion. Freud, Jung, James, Erikson and Fromm will be covered.
2 lects., 1 tut.; one term
Prerequisite: Open. Not available to students with credit in Religious Studies 2Y06.

RELIG ST 2YY6 THE JEWISH-CHRISTIAN ENCOUNTER: AN HISTORICAL SURVEY
An examination of major texts from the first century to the twentieth century relevant to the origins and development of the relationship between Judaism and Christianity. Social and political as well as theological, aspects will be considered.
2 lects., 1 tut.; two terms
Prerequisite: Open.

RELIG ST 2Z03 GREEK AND ROMAN RELIGION
A study of the role of religion in Greek and Roman public and private life.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Same as Classical Civilization 2Z03.

RELIG ST 3AA3 POPULAR RELIGION IN INDIA
The Music, Dance and Festivals of Indian Temples will be analyzed in terms of their social, psychological and political implications.
2 lects., 1 tut.; one term
Prerequisite: Religious Studies 2O03; or permission of the instructor.

RELIG ST 3B03 NATIVE AND ETHNIC RELIGIONS IN CANADA
A study of the effect of religion on native and ethnic identity, frontier religion and the new sects and cults.
2 lects., 1 tut.; one term
Prerequisite: Any course in Anthropology, Philosophy, Religious Studies, Sociology.
Same as Sociology 3Q03.

RELIG ST 3BB3 MAJOR DENOMINATIONS IN CANADA
A study of the major denominations in Canada, their history and their relation to national, regional and class identity.
2 lects., 1 tut.; one term
Prerequisite: Any Level I course in Anthropology, Philosophy, Religious Studies, Sociology.
Same as Sociology 3BB3.

RELIG ST 3C03 DIVINATION AND PHILOSOPHY OF *I-CHING* OR THE *BOOK OF CHANGES*
An exploration of *I-Ching's* divination techniques and its philosophical interpretation of man, the world, and the cosmos.
2 lects., 1 tut.; one term
Prerequisite: Open.

RELIG ST 3D03 GOD, REASON AND EVIL
An examination of religious understandings of the nature of reason and evil, and the issues these concepts raise for those holding religious beliefs.
2 lects., 1 tut.; one term
Prerequisite: Open. Students with credit in Religious Studies 3D06 may not take this course for credit.

RELIG ST 3F03 APPROACHES TO THE STUDY OF RELIGION
A study of the various ways religious phenomena can be studied, e.g. psychologically, sociologically, philosophically, theologically, comparatively, etc. Attention is also given to the history of the discipline of religious studies.
2 lects., 1 tut.; one term
Prerequisite: One of Religious Studies 2NN3, 2OO3, 2GG3; or permission of the instructor.

RELIG ST 3G03 THE DEVIL AND HIS ASSOCIATES
The course will examine Western materials dealing with Satan, the devil and devils, the appeal of devils, the meaning of the spread of devil worship, and the portrayal of devils in art.
2 lects., 1 tut.; one term
Prerequisite: Open.
Not offered in 1989-90.

RELIG ST 3I03 STORYTELLING IN INDIAN RELIGION
A survey of some of the many stories that were told by Buddhists, Jains and Hindus as a form of popular religious instruction and of the various uses made of humor and wit in religious teaching.
2 lects., 1 tut.; one term
Prerequisite: Open.
Not offered in 1989-90.

RELIG ST 3J06 RELIGION AND MODERN SOCIETY
An introduction to the thoughts and theories of scholars who have studied the relation between religion and society. In the first term, the emphasis will be on pre-World War II writings. In the second term, the empirical materials of the sociology of religion since World War II will be surveyed.
2 lects., 1 tut.; two terms
Prerequisite: Any course in Anthropology, Philosophy, Religious Studies or Sociology.
Same as Sociology 3M06.

RELIG ST 3JJ6 ANTHROPOLOGY OF RELIGION
A survey and evaluation of theoretical perspectives employed by anthropologists in the study of religion. Specific ethnographic examples will be drawn primarily, but not exclusively, from non-Western cultures.
2 lects., 1 tut.; two terms
Prerequisite: Open.
Same as Anthropology 3JJ6.

RELIG ST 3K03 INTRODUCTION TO HELLENISTIC JUDAISM
An examination of the mutual interaction of Judaism and Hellenism: the impact of Greek thought on Judaism and the contribution of Hellenistic Jewish philosophy.
2 lects., 1 tut.; one term
Prerequisite: Any of Religious Studies 2NN3, 2E06, 2FF6, 2G06, 2X03, 2Z03; or permission of the instructor.

RELIG ST 3KK3 RECENT DEVELOPMENTS IN CHRISTIAN THEOLOGY
A study of what some major Christian thinkers have been saying recently about the meaning of Christ in the modern world.
2 lects., 1 tut.; one term
Prerequisite: Open.

RELIG ST 3LL3 RELIGION AND HUMAN NATURE
What is the nature of human nature and its fulfillment? A study of recent philosophical, scientific and religious anthropology.
2 lects., 1 tut.; one term
Prerequisite: Open.

RELIG ST 3M03 SONGS OF DAVID: POETRY IN THE HEBREW BIBLE
A literary, exegetical, and theological study of poetry in the Hebrew Bible, with primary reference to the Psalms but including poems in the Pentateuch, Prophets, and Writings.
2 lects., 1 tut.; one term
Prerequisite: Open.
Not offered in 1989-90.

RELIG ST 3MM3 SCEPTICISM, ATHEISM AND RELIGIOUS FAITH
Is religious faith essential to, inimical to, or irrelevant to authentic human existence? A study of Nietzche and Kierkegaard.
2 lects., 1 tut.; one term
Prerequisite: Open.

RELIG ST 3N03 THE INDIVIDUAL AND SOCIETY IN JAPANESE TRADITION
An examination of the Japanese social order and the place of the individual within it. Examples will be drawn from Japanese religion and culture.
2 lects., 1 tut.; one term
Prerequisite: Open. Students with credit in Religious Studies 3K06 may not take this course for credit.

RELIG ST 3NN3 THE ENCOUNTER OF SCIENCE AND RELIGION
The study of the history of the encounter since the 17th century, especially issues related to Darwin's theory of evolution, and to the development of the scientific method.
2 lects., 1 tut.; one term
Prerequisite: Open. Students with credit in Religious Studies 3UU6 may not take this course for credit.
Not offered in 1989-90.

RELIG ST 3O03 THE FOURTH GOSPEL
An examination of the historical and literary backgrounds of the Gospel of John followed by a study of its context, major themes, and distinctive contribution to Christian thought.
2 lects., 1 tut.; one term
Prerequisite: One of Religious Studies 2NN3, 2E06, 2G06, 2R06; or permission of the instructor.

RELIG ST 3Q06 THE BUDDHIST TRADITION
An historical and philosophical study of Buddhism in India, China and Japan.
2 lects., 1 tut.; two terms
Prerequisite: One of Religious Studies 2O03,or 2GG3, 2O06, 2MM6, 2B06; or permission of the instructor.

RELIG ST 3SS3 BODY, MIND AND SPIRIT
An exploration of the relationship of body, mind and spirit from the standpoints of eastern and western religious thought with special reference to current perspectives. Course work includes experiential workshops.
Seminar (3 hrs.); one term
Prerequisite: Permission of the instructor.
Same as Physical Education 3SS3.
Enrolment is limited.

RELIG ST 3T03 MODERN RESEARCH IN THE LIFE AND TEACHINGS OF JESUS
An examination of the views of representative modern scholars with an analysis of the texts on which their views rest, along with a consideration of the problem of the relationship between faith and historical events.
2 lects., 1 tut.; one term
Prerequisite: One of Religious Studies 2NN3, 2E06, 2G06, 2R06; or permission of the instructor.

RELIG ST 3X03 THE LETTERS OF PAUL
An examination of the principal themes in Paul's letters, with special emphasis on his Christology, anthropology, and soteriology. Modern scholarly views will be considered.
2 lects., 1 tut.; one term
Prerequisite: One of Religious Studies 2NN3, 2E06, 2G06, 2R06; or permission of the instructor.

RELIG ST 3Y03 RELIGION IN THE CHINESE NOVEL *MONKEY (hsi-yu-chi)*
A study of the religious dimension in Wu Ch'eng-en's (c. 1500-1582) popular novel. The journey in search of the scripture will be treated as an allegory for the Buddhist and Taoist spiritual quest.
2 lects., 1 tut.; one term
Prerequisite: Open.

REQUIRED LEVEL IV COURSES FOR HONOURS STUDENTS

RELIG ST 4FF3 APPROACHES TO THE STUDY OF RELIGION
A seminar in which important works representing different methodologies for the study of religion will be examined and discussed in detail.
1 seminar (2 hr.); one term
Prerequisite: Religious Studies 3F03, and enrolment in Honours Religious Studies.

RELIG ST 4GG3 HONOURS SEMINAR
A seminar in which the substance of the advanced research conducted in Advanced Study courses by participants will be presented and discussed by all members of the seminar.
1 seminar (2 hr.); one term
Prerequisite: Religious Studies 4FF3.

ADVANCED STUDY COURSES

RELIG ST 4AA6**	Advanced Study in Hindu Religious History
RELIG ST 4BB6**	Advanced Study in Buddhist and East Asian Religious History
RELIG ST 4CC6**	Advanced Study in Early Jewish and Christian Sources
RELIG ST 4DD6**	Advanced Study in Religion and Western Thought
RELIG ST 4E06**	Advanced Study in Indian Philosophy
RELIG ST 4EE6**	Advanced Study in Religion and Western Society
RELIG ST 4I06**	Advanced Study in Hebrew Bible and Interpretation
RELIG ST 4W06**	Advanced Study of Religion
RELIG ST 4Y03**	Advanced Study of Religion

SANSKRIT

SANSKRIT 3A06 INTRODUCTION TO SANSKRIT GRAMMAR
Basic course in the elements of Sanskrit grammar. No previous knowledge of Sanskrit is required.
3 lects.; two terms
Prerequisite: Open.

SANSKRIT 4B06 READINGS IN SANSKRIT TEXTS
Intermediate course with readings in selected texts.
3 lects.; two terms
Prerequisite: Sanskrit 3A06.

HEBREW

HEBREW 2A06 HEBREW
The inductive study of the Hebrew language, leading to the mastery of the general principles of grammar and syntax. Prose work throughout the year.
3 lects.; two terms
Prerequisite: Open.

HEBREW 3A06 INTERMEDIATE HEBREW
Extensive readings in Biblical prose (selections from some or all of the following: The Pentateuch, Former Prophets, Ruth and Esther), and some readings in the second term in Rabbinic literature (Mishna and Aggada).
Two terms
Prerequisite: Hebrew 2A06.

CHINESE

CHINESE 1Z06 BEGINNER'S INTENSIVE CHINESE
An intensive beginner's course in modern Chinese designed for students with no prior knowledge of the language. Speaking, reading and grammar are equally emphasized. 550 Chinese characters will be taught.
4 hours; two terms
Prerequisite: Open. Students who either speak any Chinese dialect, or read Chinese may not register in this course

For **Graduate Courses**, see *Calendar of School of Graduate Studies.*

Russian

Courses and programmes in *Russian* are administered within the Department of Modern Languages of the Faculty of Humanities.

Faculty as of January 15, 1989

Professor Emeritus

Louis J. Shein/B.A. *(Dubuque)*, M.A., Ph.D. *(Toronto)*, D.D. *(Honoris Causa)*, Knox College *(Toronto)*

Professors

Samuel D. Cioran/B.A. *(McMaster)*, Ph.D. *(Toronto)*
Walter Smyrniw/B.A. *(McMaster)*, M.A., Ph.D. *(Toronto)*
George Thomas/B.A., Ph.D. *(London)*

Associate Professors

Nina S. Kolesnikoff/M.A. *(Moscow State)*, Ph.D. *(Alberta)*

Department Notes:

The following courses are taught in English and are open as electives to qualified students registered in any University programme.

Russian 2A06	Nineteenth-Century Russian Literature in Translation
Russian 3D03	Russian Drama Since 1800
Russian 3K06	Twentieth-Century Russian Literature in Translation

Beginner's Language Course

RUSSIAN 1Z06 BEGINNER'S INTENSIVE RUSSIAN

An intensive beginner's course designed for students with no prior knowledge of the language. This course gives the student a basic knowledge of Russian grammar, while emphasizing spoken Russian. The course is enhanced by a CALL (Computer-Aided Language Learning) module.
5 hrs; two terms
Prerequisite: Open. Students with prior knowledge of the language as determined by a placement test may be required to take an appropriate alternative.

Intermediate and Advanced Language and Literature Courses

RUSSIAN 2A06 NINETEENTH-CENTURY RUSSIAN LITERATURE IN TRANSLATION

A survey with special concentration on Gogol, Turgenev, Tolstoy, and Dostoevsky.
3 lects.; two terms
Prerequisite: Open to students in Level II and above; or permission of the Department.

RUSSIAN 2C06 INTERMEDIATE LANGUAGE STUDY

4 hrs.; two terms
Prerequisite: Grade 13 or OAC Russian, or Russian 1Z06; or permission of the Department.

RUSSIAN 3C06 ADVANCED LANGUAGE STUDY

4 hrs.; two terms
Prerequisite: Russian 2C06.

RUSSIAN 3D03 RUSSIAN DRAMA SINCE 1800

An introduction in translation to the major works of Russian theatre.
3 lects.; one term
Prerequisite: Open to students in Level II and above.
Not offered in 1989-90. Offered in alternate years.
Same as Drama 3DD3.

RUSSIAN 3K06 TWENTIETH-CENTURY RUSSIAN LITERATURE IN TRANSLATION

Prominent Soviet writers, such as Gorky, Sholokhov, Pasternak, and Solzhenitsyn, viewed against the broader cultural, historical, and social spectrum.
3 lects.; two terms
Prerequisite: Open to students in Level II and above.

RUSSIAN 4C06 CONVERSATION AND ADVANCED COMPOSITION

3 lects.; two terms
Prerequisite: Russian 3C06.

RUSSIAN 4G03 TOPICS IN RUSSIAN LITERATURE I

1 lect., 1 tut.; one term
Prerequisite: Russian 2C06.
Russian 4G03 may be repeated, if on a different topic, to a total of six units.
Not offered in 1989-90.

RUSSIAN 4H03 INDEPENDENT STUDY

A reading course under the supervision of a member of the Department. A major paper is required.
Prerequisite: Registration in Level IV of a Russian programme, and permission of the Department.

RUSSIAN 4I03 TOPICS IN RUSSIAN LITERATURE II

1989-90: Twentieth-Century Short Story
Readings in the original language of the short stories of Bunin, Babel, Zoshchenko, Kazakov and Aksenov.
1 lect., 1 tut.; one term
Prerequisite: Russian 2C06.
Russian 4I03 may be repeated, if on a different topic, to a total of six units.

RUSSIAN 4J03 TOPICS IN RUSSIAN LANGUAGE I

3 lects.; one term
Prerequisite: Russian 2C06; or permission of the Department.
Not offered in 1989-90.
Russian 4J03 may be repeated, if on a different topic, to a total of six units.

RUSSIAN 4K03 TOPICS IN RUSSIAN LANGUAGE II

3 lects.; one term
Prerequisite: Russian 2C06.
Not offered in 1989-90. Offered in alternate years.
Russian 4K03 may be repeated, if on a different topic, to a total of six units.

Sanskrit

(See *Religious Studies, Sanskrit*)

Science

These *Science* courses are primarily designed for students in the Humanities and Social Sciences, to give an appreciation of important areas of modern science. These courses do not assume any specific background in science. Enrolment in each is limited to 100 students, but most of the courses are not oversubscribed.

Other Science courses that may be of interest to students in the Humanities and Social Sciences are offered by Department. They are:

Biochemistry 2E03	Introductory Biochemistry
Biology 1G06	Introduction to Biology
Chemistry 1C03	General Chemistry
Chemistry 2D03	Introductory Organic Chemistry
Geography 1A06	Physical Geography
Geology 1A03	Surveys of Geological Sciences
Geology 1C03	Earth Processes
Mathematics 2H03	Ideas in Mathematics
Physics 2J03	Physics of Musical Sound
Physics 2M03	Mechanics

SCIENCE 2A03 THE NATURE OF MATTER

Contemporary ideas about the structure of atoms and molecules; the collective behaviour of large numbers of atoms in solids, liquids, and gases and the technological implications of such behaviour.
3 lects.; one term
Prerequisite: Registration in Level II, III, or IV of a non-science programme. No mathematics is required.

SCIENCE 2C03 CONTINENTAL DRIFT AND PLATE TECTONICS

A review of modern ideas of crustal movement, the origin of volcanoes and earthquakes and the construction of mountain belts, as portions of the crust drift and collide.
2 lects., 1 tut.; one term
Prerequisite: Registration in Level II, III, or IV of a non-science programme. Not open to students who are registered or have credit in, Geology 1A03, 1A06, or 1C03.

SCIENCE 2D03 ASTRONOMY

A survey of modern and historical concepts in astronomy. Light and the telescope; distance measurement in space; the structure and evolution of stars, galaxies, cosmology.
3 lects.; one term
Prerequisite: Registration in Level II, III, or IV of a non-science programme. Grade 12 Mathematics required.

SCIENCE 2G03 THE WORLD'S SUPPLY OF FOOD

Man's food requirements; how food is produced; alternative approaches to alleviating world hunger.
3 lects. or 2 lects., 1 tut.; one term
Prerequisite: Registration in Level II, III, or IV of any programme.

SCIENCE 2H03 THE MOLECULAR BASIS OF LIFE

A survey of the molecular basis of life; the current revolution in biology caused by recombinant DNA technolgy and its implications for the future.
3 lects.; or 2 lects., 1 tut.; one term
Prerequisite: Registration in Level II, III, or IV of a non-science programme.

SCIENCE 2K03 HEREDITY, EVOLUTION AND THE ENVIRONMENT

Introduction to the principles of human genetics and evolutionary biology, the adaptation of organisms to their environment, biological diversity and integrated ecosystems.
3 lects. or 2 lects. and 1 tut.; one term
Prerequisite: Registration in Level II, III, or IV of a non-science programme.

SCIENCE 2L03 EARTH RESOURCES AND THE ENVIRONMENT

Origin and exploration of ore deposits and fossil fuels. Water resources and their pollution; radioactive waste disposal.
2 lects., 1 tut.; one term
Prerequisite: Registration in Level II, III, or IV of a non-science programme. Not open to students who are registered or have credit in, Geology 1A03, 1A06 or 1C03.

Serbo-Croatian

Courses in *Serbo-Croatian* are administered within the Department of Modern Languages of the Faculty of Humanities.

SERBO CR 1Z06 INTRODUCTION TO SERBO-CROATIAN

An introduction to basic conversational and written Serbo-Croatian. The essential grammar of the language will be taught. Readings will be in both the Cyrillic and Latin scripts.
5 hrs. (lects. and lab. practice); two terms

Prerequisite: Open. Students with prior knowledge of the language as determined by a placement test may be required to take an appropriate alternative.
Not offered in 1989-90.

SERBO CR 2Z06 INTERMEDIATE SERBO-CROATIAN
Review of grammar, oral practice and compositions.
4 hrs.; two terms
Prerequisite: Serbo-Croatian 1Z06; or permission of the Department.

Social Science

SOC SCI 2B06 INTRODUCTION TO THE STUDY OF PEACE
The concept of peace; an analysis of contemporary war and of conditions for peace, grounded in specific case studies; the roles of values, ideologies and strategies in the attainment of peace; peace research as a discipline.
3 hrs. (lects. and discussions); two terms
Prerequisite: Open

SOC SC 2C03 GENOCIDE AND ETHNOCIDE
Genocide: extermination of a people; *ethnocide*: destruction of the culture and identity of a people, tribe, or community. The course will examine and analyze cases of genocide and ethnocide, which have for the most part resulted from the actions of Europeans and their overseas decendants, affecting non-Western peoples in recent centuries. It will also examine other results, both actual and possible, of inter-societal contact.
3 hrs; one term
Prerequisite: Open

SOC SC 2D03 PEACE AND DEVELOPMENT
Analysis of economies of less developed countries and the processes of transformation that govern their growth and development. Special emphasis will be placed on the relationship between development and peace. Topics include structural change, dependency theory, new economic order, self-reliance, the role of multinationals in the third world, militarism and development, international aid and debt, world hunger, the global environment, world distribution of resources, industry and technology and finally, the theory and practice of unequal exchange.
3 hrs; one term
Prerequisite: Open.

SOC SCI 2E03 SELECTED TOPICS IN INTERDISCIPLINARY STUDIES I
An interdisciplinary examination of selected topics of current interest to social scientists. Topics will vary from year to year.
3 hrs. (lects. and seminars); one term
Prerequisite: Open. Students interested in this course should consult the Office of the Associate Dean (Studies) of the Faculty of Social Sciences concerning the topics to be examined in any year.

SOC SCI 2F03 SELECTED TOPICS IN INTERDISCIPLINARY STUDIES II
An interdisciplinary examination of selected topics of current interest to social scientists. Topics will vary from year to year. (This course should not normally be considered as an extension of Social Science 2E03.)
3 hrs. (lects. and seminars); one term
Prerequisite: Open. Students interested in this course should consult the Office of the Associate Dean (Studies) of the Faculty of Social Sciences concerning the topics to be examined in any year.

SOC SCI 3B03 CREATIVITY AND HUMAN INTERACTION
A study of the motivations of some representative writers and of the psychological processes in literary creativity. Psychoanalytic and psychiatric contributions to understanding the subject will be considered.
3 lects.; one term
Prerequisite: Permission of the instructor. Not available to students with credit in English 3U03, or Sociology 2B03 or 2X03.
Same as English 3F03 and Sociology 3S03.

Social Work

Faculty as of January 15, 1989

M. Susan Watt/*Director*

Professors Emeriti

Cyril Greenland/M.Sc. *(North Wales)*, Ph.D. *(Birmingham)*
Harry L. Penny/Dip. Theol. *(Union College, British Columbia)*, B.A., M.S.W. *(British Columbia)*
Michael Wheeler/B.A. *(London)*, M.S.W. *(British Columbia)*, Dip Sc. Admin. *(London School of Economics)*

Professor

Remesh Mishra/B.Sc., Ph.D. *(London)*

Associate Professors

Kalervo I. Kinanen/Dip. S.W. *(Helsinki)*, B.A. *(McMaster)*, M.S.W. *(British Columbia)*
J. McEwan Macintyre/B.A., M.S.W. *(British Columbia)*, D.S.W. *(Southern California)*
Sally Palmer/B.A. *(Western)*, B.S.W., M.S.W., Ph.D. *(Toronto)*
James J. Rice/B.A. *(Sir George Williams)*, B.S.W., M.S.W. *(Calgary)*, Ph.D. *(Exeter)*
David J. Tucker/B.A. *(New Brunswick)*, M.S.W. *(McGill)*, Ph.D. *(Toronto)*
M. Susan Watt/B.A., M.S.W., Adv. Dip. S.W. *(Toronto)*, D.S.W. *(UCLA)*

Assistant Professors

Ralph A. Brown/B.A., M.S.W. *(Waterloo Lutheran)*, D.S.W. *(UCLA)*
Roy Cain/B.S.W., M.S.W., Ph.D. *(McGill)*
Lorna F. Hurl/B.A. *(Calgary)*, B.Soc.Admin *(Flinders)*, M.S.W. *(Manitoba)*, Ph.D. *(Toronto)*
L. William Lee/B.A. *(St. Thomas, Texas)*, M.S.W., Adv. Dip. S.W. *(Toronto)*, Ed.D. *(Toronto)*
Sheila Sammon/B.A. *(Nazareth College of Rochester, N.Y.)*, M.S.W. *(Toronto)*
Boris Stein/B.A., M.S.W. *(McGill)*

Lecturer

Sheree D. Meredith/B.A. *(Trent)*, M.S.W. *(Wilfrid Laurier)*

Associate Members

N.C. Agarwal/B.A., M.A. *(Delhi)*, Ph.D. *(Minneapolis)*, (Business)
J.A. Johnson, M.A., Ph.D. *(Minnesota)*, (Economics)

Department Notes:

1. Except when designated as † these courses are open **only** to students registered in the Combined B.A./B.S.W. Programme, or the B.S.W. programme for a second degree.
2. Registration in all courses marked ** listed as selected topics, independent research, individual readings and honours essays requires written permission of the Department. Registration with appropriate permission must be completed by *all* students, including those registered in the combined B.A./B.S.W. or B.S.W. Second Degree programmes, no later than the last day for registration as stated in the Calendar under *Sessional Dates*.

SOC WORK 2B06 SOCIAL WELFARE: GENERAL INTRODUCTION
Purposes and values of social welfare programmes and services. Social welfare policy and the social security system in Canada in historical perspective.
Lects. and discussion; two terms
Term 1 of this course is the same as Labour Studies 2B03 and Term 2 is the same as Labour Studies 2BB3. Students in a Social Work programme must register for this course as Social Work 2B06.

SOC WORK 2C03 THEORY FOR SOCIAL WORK PRACTICE
Knowledge base; social work values, fields of practice and types of intervention.
Lectures, films, discussions, small task-groups; one term
Prerequisite: Not available to students with credit in Social Work 2C06.

SOC WORK 2D03** INTERPERSONAL COMMUNICATION AND INTERVIEWING
Theories of interpersonal communication. Basic skills in interpersonal communication and interviewing.
Lectures, discussions, exercises; one term
Prerequisite: Permission of the School of Social Work is required. Not available to students with credit in Social Work 2C06.
Enrolment is limited.

SOC WORK 2E03 HUMAN GROWTH AND DEVELOPMENT IN THE SOCIAL ENVIRONMENT
Human development throughout the life span with emphasis on the interaction between the personal and social contexts and social work concerns at each developmental stage.
Lectures and discussion (3 hrs.); one term
Prerequisite: Completion of or registration in Psychology 2A03.

SOC WORK 3C03** SOCIAL ASPECTS OF HEALTH AND DISEASE†
Exploration of the meaning of health and sickness in our society. Organization and delivery of health care. Consideration of ethical and other issues.
Lectures, discussion and selective use of community resources; one term
Prerequisite: Permission of the School of Social Work is required by all students.
This course may be taken as an elective for B.A. credit by undergraduates not in Social Work.
Enrolment is limited.

SOC WORK 3D06 THE PRACTICE OF GENERAL SOCIAL WORK I
Social work intervention processes; interviewing; development of basic skills in formation of relationships with individuals, families, groups and communities.
Seminars, workshops; two terms

Option of equivalent summer block in combination with Social Work 3DD3 (summer). Priority for summer block given to B.S.W. (Second Degree) students.
Prerequisite: Social Work 2B06, 2C03, 2D03, 2E03, and registration in Social Work 3DD3. Not available to students with credit in Social Work 3D09.
Credit in this course is ***dependent*** *on achieving a minimum grade of C+ in Social Work 3D06* ***and*** *a 'Pass' in Social Work 3DD3. Enrolment is limited.*

SOC WORK 3DD3 FIELD PRACTICUM I
Field practicum to develop basic intervention and interviewing skills, particularly in the formation of relationships with individuals, families, groups and communities. Students participate in defining learning goals and experiences.
Field experience equivalent to 10 hours per week; two terms
Option of equivalent summer block placement in combination with Social Work 3D06 taken in the summer. Priority for summer block given to B.S.W. (Second Degree) students.
Prerequisite: Registration in Social Work 3D06. This course is evaluated on a 'Pass'/'Fail' basis.
Credit in this course is ***dependent*** *on receiving a 'Pass' in Social Work 3DD3* ***and*** *a minimum grade of C+ in Social Work 3D06.*
Enrolment is limited.

SOC WORK 3G03** SOCIAL WELFARE POLICY AND PROCESS†
Role of values and assumptions in the development of welfare policies. Analysis of key concepts in policy planning. Study of policy and programmes in selected areas.
Lectures and seminars; one term.
Prerequisite: Permission of the School of Social Work is required by all students.
This course may be taken as an elective for B.A. credit by undergraduates not in Social Work.
Enrolment is limited.

SOC WORK 3H03** JUSTICE AND SOCIAL WELFARE†
Human rights and the role of law in enhancing civil liberties in Canada. Social work, law and social change. Study of selected issues and review of administrative discretion.
Seminars; one term
Prerequisite: Permission of the School of Social Work is required by all students.
This course may be taken as an elective for B.A. or B.H.Sc. credit by undergraduates not in Social Work.
Enrolment is limited.

SOC WORK 3J03** TECHNOLOGY AND SOCIAL WELFARE†
Problems of social policy posed by the impact of technology in such areas as work and leisure, income maintenance, participation in decision-making and social planning.
Seminars; one term
Prerequisite: Permission of the School of Social Work is required by all students.
This course may be taken as an elective for B.A. credit by undergraduates not in Social Work.
Enrolment is limited.

SOC WORK 3N03 SELECTED THEORIES OF SOCIAL WORK INTERVENTION
Examination and analysis of strategies of intervention in working with individuals and groups in social work.
Seminars; one term.
Prerequisite: Enrolment in, or completion of, Social Work 2E03. Not available to students with credit in Social Work 4N03.

SOC WORK 3O03 HUMAN SEXUALITY
Basic information on anatomy, physiology, psychology and sociology of sexuality and fertility. Attitudinal self-awareness, communication skills, values regarding sexual identity and roles; analysis of policy issues.
Seminars; one term

SOC WORK 3P03** CONCENTRATED STUDIES IN SOCIAL WORK PRACTICE
Completion of a major project focusing on a selected social work problem or issue.
Tuts.; two terms
Prerequisite: Permission of the supervising instructor and course co-ordinator.

SOC WORK 3R03 SOCIAL WORK WITH GROUPS
This course will provide a theoretical knowledge of group practice models for social work within an historical and didactic social work framework.
Lectures, discussions and tutorials; one term
Enrolment is limited.

SOC WORK 4D06 THE PRACTICE OF GENERAL SOCIAL WORK II
Seminars to deepen understanding and further develop practice skills.
Two terms
Option of equivalent block placement in combination with Social Work 4DD6.
Prerequisite: Social Work 3D06, 3DD3 and registration in Social Work 4DD6. Not available to students with credit in Social Work 4D12.
Credit in this course is ***dependent*** *on achieving a minimum grade of C+ in Social Work 4D06* ***and*** *a 'Pass' in Social Work 4DD6.*
Enrolment is limited.

SOC WORK 4DD6 FIELD PRACTICUM II
Field experience to refine practice skills. Students spend the equivalent of two days per week in social agencies, or with other organizations, in supervised practice.
Option of equivalent block placement in conjunction with Social Work 4D06.
Prerequisite: Registration in Social Work 4D06. This course is evaluated on a 'Pass'/'Fail' basis.
Credit in this course is ***dependent*** *on receiving a 'Pass' in Social Work 4DD6* ***and*** *a minimum grade of C+ in Social Work 4D06.*
Enrolment is limited.

SOC WORK 4G03** SELECTED SOCIAL ISSUES AND SOCIAL WORK
Critical examination of social work practice or social welfare policy in respect to selected social issues. Topics will vary from year to year and the School should be consulted for details for any particular year.
Seminars; one term
Prerequisite: Permission of the School of Social Work is required by all students.
This course may be repeated if on a different topic.
Enrolment is limited.

SOC WORK 4H03 HUMAN SERVICE ORGANIZATIONS: STRUCTURES AND PROCESSES
Relationships of structures and processes to patterns of service delivery. Knowledge and skills necessary for organizational diagnosis; empirical study of an organization is required.
Seminars; one term

SOC WORK 4J03** SOCIAL CHANGE AND SOCIAL WELFARE†
Critical examination of the meaning of social change as a concept and event. Review of strategies of social change and of attempts to effect social change.
Seminars; one term
Prerequisite: Permission of the School of Social Work is required by all students.
This course may be taken as an elective for B.A. credit by undergraduates not in Social Work.
Enrolment is limited.

SOC WORK 4K03** CONCENTRATED STUDIES IN SOCIAL WELFARE POLICY
Independent study of a particular issue of interest in social welfare, and completion of a major essay or project.
Discussion and tutorials; two terms
Prerequisite: Permission of the supervising instructor and course co-ordinator.

SOC WORK 4M03** INTERNATIONAL AND COMPARATIVE SOCIAL WELFARE†
Comparative perspective on problems of social structures in shaping social welfare institutions. Scope and limits of international collaboration.
Seminars; one term
Prerequisite: Permission of the School of Social Work is required by all students.
This course may be taken as an elective for B.A. credit by undergraduates not in Social Work.
Enrolment is limited.

SOC WORK 4O03 COMMUNITY WORK
Analysis of major community work strategies, historical antecedents, current developments and future potential in Canada. Student participation in the analysis of a community project is expected.
Seminars; one term
Prerequisite: Registration or credit in Social Work 3D06 and 3DD3, or 3D09; or permission of the instructor.

SOC WORK 4P03 PROFESSIONAL ISSUES
A seminar focusing on the status, roles and values of the professional social worker in contemporary society.
Seminars; one term
Prerequisite: Registration or credit in Social Work 3D06 and 3DD3, or 3D09.

SOC WORK 4T03 SOCIAL WORK PRACTICE WITH WOMEN
Study of feminist and non-sexist social work practice (with individuals, groups and the community) and implications for women of selected social policies.
Seminars; one term

SOC WORK 4V03 SOCIAL WORK PRACTICE WITH THE AGED
A critical analysis of the social context in which the aged live, and an examination of social work methods as they apply to the aged.
Seminars; one term

SOC WORK 4W03 CHILD WELFARE
This course analyzes the Canadian child welfare system, its policies and programmes and teaches skills for working with children, families and substitute caregivers.
Lectures, discussions, skills development; one term.
Prerequisite: Social Work 2B06, 2C03, 2D03 and 2E03.

SOC WORK 4X03 FAMILY IN SOCIAL WORK PRACTICE
Examination of relevant aspects of family theory for social work practice; models of family intervention.
Seminars; one term
Prerequisite: Registration in, or credit in, Social Work 3D06 and 3DD3, or 3D09; or permission of the instructor. Not available to students with credit in Social Work 3M03.
Enrolment is limited.

SOC WORK 4Y03 METHODS OF APPLIED SOCIAL RESEARCH
Examination of the conceptual framework of scientific inquiry relating to social work research and practice. Survey of selected research from other disciplines relevant to social work.
Seminars; one term
Prerequisite: Not available to students with credit in Social Work 3K03.

For **Graduate Courses** see *Calendar, School of Graduate Studies.*

Sociology

Faculty as of January 15, 1989
A.A. Hunter/*Chairman*

Professors Emeriti

Howard M. Brotz/B.A., M.A. (*Chicago*), Ph.D. (*London*)
Frank E. Jones/B.A., M.A. (*McGill*), Ph.D. (*Harvard*)

Professors

Carl J. Cuneo/B.A., M.A., Ph.D. (*Waterloo*)
Rhoda E. Howard/B.A., M.A., Ph.D. (*McGill*)
Alfred Hunter/B.A. (*University of British Columbia*), M.A., Ph.D. (*Wisconsin*)
Cyril H. Levitt/B.A., M.A. (*Waterloo*), Ph.D. (*Freie Universitat, Berlin*)
D. Ralph L. Matthews/B.A. (*Memorial*), M.A., Ph.D. (*Minnesota*)
Peter C. Pineo/B.A. (*University of British Columbia*), M.A. (*McGill*), Ph.D. (*Chicago*)
William B. Shaffir/B.A., M.A., Ph.D. (*McGill*)

Associate Professors

W. Peter Archibald/B.A. (*Mt. Allison*), M.A. (*University of British Columbia*), Ph.D. (*University of Michigan*)
Robert E. Blumstock/B.A., M.A. (*City College, N.Y.*), Ph.D. (*Oregon*)
Richard A. Brymer/B.A., M.A. (*Texas*), Ph.D. (*Michigan State*)
Jack W. Haas/B.S. (*SUNY, Brockport*), Ph.D. (*Syracuse*)
Franklin W. Henry/Ph.B. (*Marquette*), M.A., Ph.D. (*Catholic University of America*)
Roy W. Hornosty/B.S.P., M.A. (*University of British Columbia*), Ph.D. (*SUNY, Buffalo*)
Graham K. Knight/B.A. (*Kent*), M.A., Ph.D. (*Carleton*)
Gerald Rosenblum/A.B. (*California, Berkeley*), M.S. (*Oregon*), A.M., Ph.D. (*Princeton*)
Jane Synge/M.A. (*Aberdeen*), Ph.D. (*London*)
Peta E. Tancred-Sheriff/B.A. (*McGill*), M.A. (*Montreal*), Ph.D. (*London*)
Vivienne Walters/B.A., M.A. (*Sheffield*), Ph.D. (*McGill*)

Assistant Professors

Charlene Miall/B.A. (*Ottawa*), M.A. (*Calgary*), Ph.D. (*York*)
Julia O'Connor/B.A., M.Soc.Sc. (*Ireland*), Ph.D. (*Toronto*)
Jack Richardson/B.A., M.A., Ph.D. (*Toronto*)
R.H. Storey/B.A. (*Toronto*), M.A. (*Dalhousie*), Ph.D. (*Toronto*)

Lecturers

Rhonda Lenton/B.A., M.A. (*Manitoba*)
Dorothy Pawluch/B.A. (*Laurentian*), M.A. (*McGill*)

Associate Members

P. Donnelly/ (Physical Education) B.A. (*N.Y.*), M.A., Ph.D. (*Massachusetts*)
L. Greenspan/ (Religious Studies) M.A. (*Dalhousie*), Ph.D. (*Brandeis*)
C. Jones/ (Sociology, Toronto) B.A. (*Cambridge*), Ph.D. (*Edinburgh*)
R. Mishra/ (Social Work) B.Sc., Ph.D. (*London*)

Department Notes:

1. Students should consult the Department's *Handbook for Undergraduates, 1989-90*, which will be available prior to registration, for fuller course descriptions and any changes in the list of courses offered in 1989-90. Students should check the *Handbook* in order to find the term in which 'one term' courses are offered.
2. Sociology 1A06 and several other courses are divided into independent sections. For more information, see the Sociology Department's *Handbook for Undergraduates, 1989-90*. This booklet gives course descriptions for the various Sociology 1A06 sections.
3. Registration in all courses marked ★★ listed as selected topics, independent research, individual readings and honours essays requires written permission of the Department. Registration with appropriate permission must be completed no later than the last day for registration as stated in the Calendar under *Sessional Dates*.

SOCIOL 1A06 AN INTRODUCTION TO SOCIOLOGY
A survey of the areas of research which interest the sociologist. Interpretation of human action from the standpoint of the group. Emphasis is given to contemporary culture and society, although there is reference to primitive cultures and societies.
2 lects., 1 tut., two terms
Prerequisite: Open.

SOCIOL 2C06 DEVIANT BEHAVIOUR
An analysis of deviant behaviour and conformity in relation to social structure and processes, and a discussion of problems of control within the social system.
3 hrs. (lects. and discussion); two terms
Prerequisite: Sociology 1A06; or permission of the instructor.
Enrolment is limited.

SOCIOL 2D06 THE HUMAN GROUP
An examination of the individual in social interaction, with emphasis upon relationships between this and social structure.
3 hrs. (lects. and discussion); two terms
Prerequisite: Sociology 1A06; or permission of the instructor.

SOCIOL 2E06 RACIAL AND ETHNIC GROUP RELATIONS
The course deals with the study of racial and ethnic group relations in Canada and the United States.
3 hrs. (lects. and discussion); two terms
Prerequisite: Sociology 1A06; or permission of the instructor.

SOCIOL 2H06 A SOCIOLOGICAL ANALYSIS OF CANADIAN SOCIETY
The application of sociological concepts to the character and social structure of Canada, with particular emphasis on its major social class, regional, and ethnic divisions.
3 hrs. (lects. and discussion); two terms
Prerequisite: Open.

SOCIOL 2I03 THE SOCIOLOGY OF ORGANIZATIONS I
A theoretical and empirical analysis of formal and informal organizational structures and processes in the major sectors of modern industrial society.
3 hrs. (lects. and discussion); one term
Prerequisite: Sociology 1A06; or permission of the instructor.
Same as Labour Studies 3I03.

SOCIOL 2J03 CURRENT PROBLEMS IN SOCIOLOGICAL ANALYSIS
Selected problems in contemporary sociology.
Topics will vary and the Department should be consulted for details for any particular year.
3 hrs. (lects. and discussion); one term
Prerequisite: Sociology 1A06; or permission of the instructor.

SOCIOL 2K03 CURRENT PROBLEMS IN SOCIOLOGICAL ANALYSIS
Same as Sociology 2J03.
3 hrs. (lects. and discussion); one term
Prerequisite: Sociology 1A06; or permission of the instructor.

SOCIOL 2M06 INDUSTRIALIZATION AND DEVELOPMENT
Introduction to theories of modernization and underdevelopment with comparative empirical content.
3 hrs. (lects. and discussion); two terms
Prerequisite: Sociology 1A06; or permission of the instructor.

SOCIOL 2O06 SOCIAL STRATIFICATION
A broad comparative study of social class and social mobility.
3 hrs. (lects. and discussion); two terms
Prerequisite: Sociology 1A06; or permission of the instructor.

SOCIOL 2P06 THE SOCIOLOGY OF EDUCATION
A comprehensive analysis of educational institutions in modern society.
3 hrs. (lects. and discussion); two terms
Prerequisite: Sociology 1A06; or permission of the instructor.
Enrolment is limited.

SOCIOL 2Q06 SOCIOLOGY OF WOMEN
An analysis of the status and objective condition of women in Canada (including theories of socialization and of stratification).
3 hrs. (lects. and discussion); two terms
Prerequisite: Sociology 1A06; or permission of the instructor.
Enrolment is limited.

SOCIOL 2S06 INTRODUCTION TO SOCIOLOGICAL THEORY
An introduction to the foundations, rise and development of sociological theory.
3 hrs. (lects. and discussion); two terms
Prerequisite: Sociology 1A06; or permission of the instructor. Not open to students with credit in Sociology 2S03 or 3A06.

SOCIOL 2U06 SOCIOLOGY OF THE FAMILY
An analysis of kinship and family units in comparative, historical, and contemporary perspective.
3 hrs. (lects. and discussion); two terms
Prerequisite: Sociology 1A06; or permission of the instructor.
Enrolment is limited.

SOCIOL 2V06 OCCUPATIONS AND PROFESSIONS
An examination of the occupational structure of industrial society, the changing nature of work, and problems associated with such change.
3 hrs. (lects. and discussion); two terms
Prerequisite: Sociology 1A06; or permission of the instructor.

SOCIOL 2X03 PSYCHOANALYTIC APPROACHES TO LITERARY TEXTS
The basic assumptions and methods of psychoanalytic criticism will be studied with reference to selected texts in drama, fiction and poetry from Shakespeare to the present.
One term

Prerequisite: Registration in Level II and above. Not open to students with credit for this topic if taken as English 3KK3.
Same as English 3B03.

SOCIOL 2Y03 INTRODUCTION TO QUANTITATIVE STUDIES
The course is designed to develop those skills necessary to understand and evaluate research studies in sociology using quantitative methods. Descriptive statistics and basic inferential techniques will be examined.
3 hrs. (lects. and discussion); one term
Prerequsite: Registration in Honours or B.A. Sociology; or Honours Anthropology; or Social Work; or permission of the instructor. Not open to students who are registered in, or have received credit for, a statistics course.
Enrolment is limited.

SOCIOL 2Z03 INTRODUCTION TO SOCIOLOGICAL RESEARCH
This course is designed to develop those skills necessary to pursue and understand research. Several general methods of sociological research will be examined.
3 hrs. (lects. and discussion); one term
Prerequisite: Registration in any programme in Sociology; or permission of the instructor.
Enrolment is limited.
Same as Anthropology 2Z03.

SOCIOL 3A03 EUROPEAN SOCIOLOGICAL THEORY
An advanced examination of classical and contemporary European sociological theory.
3 hrs. (lects. and discussion); one term
Prerequisite: Sociology 2S03 or 2S06; or permission of the instructor. Not open to students with credit in Sociology 3A06.

SOCIOL 3AA3 THE SOCIOLOGY OF MASS MEDIA
The development of the mass media (the press, magazines, radio, television), with particular attention to their social organization, how information and news are produced, and effects upon social attitudes and behaviour.
3 hrs. (lects. and discussion); one term
Prerequisite: Sociology 1A06, and registration in any Social Sciences programme; or permission of the instructor.
Enrolment is limited.

SOCIOL 3B03 SELECTED TOPICS IN THE SOCIOLOGY OF EDUCATION
An examination of selected topics in the sociology of education.
3 hrs. (lects. and discussion); one term
Prerequisite: At least 18 units of Sociology, or permission of the instructor.

SOCIOL 3BB3 MAJOR DENOMINATIONS IN CANADA
A study of the major denominations in Canada, their history and their relation to national, regional and class identity.
2 lects., 1 tut.; one term
Prerequisite: Any Level I course in Anthropology, Philosophy, Religious Studies, Sociology.
Same as Religious Studies 3BB3.

SOCIOL 3C06 SOCIO-ECONOMIC DEVELOPMENT
Selected topics in the sociology of underdeveloped countries, including social stratification, revolution, the place of women, and processes of social change.
3 hrs. (lects. and seminars); two terms
Prerequisite: At least 18 units of Sociology, or any Level II course in Political Science, or permission of the instructor.
Same as Political Science 3B06.

SOCIOL 3D03 SPECIAL TOPICS IN THE SOCIOLOGY OF THE FAMILY
An advanced course allowing detailed study of selected topics in the Sociology of the Family.
3 hrs. (lects. and discussion); one term
Prerequisite: Sociology 1A06; or permission of the instructor.
Enrolment is limited.

SOCIOL 3DD3 SPORT AND SOCIAL DEVELOPMENT
Macro-analysis of sport and culture, considering the place of sport and leisure in cultural transmission and change.
3 hrs. (lects. and discussion); one term
Same as Physical Education 3P03.
With permission of the instructor, this course may be taken as an elective for B.A. credit by undergraduates not in Physical Education.

SOCIOL 3EE3 SPORT AND SMALL GROUP DYNAMICS
Micro-analysis of sport in small social systems: investigation of the dynamics of involvement in sport encounters, the team as a small group, and sport sub-cultures.
3 hrs. (lects. and discussion); one term
Same as Physical Education 3Q03.
With permission of the instructor, this course may be taken as an elective for B.A. credit by undergraduates not in Physical Education.

SOCIOL 3F06 POLITICAL SOCIOLOGY
A survey of social and state institutions, focusing on current debates in the field.
3 hrs. (lects. and discussion); two terms
Prerequisite: Sociology 1A06; or permission of the instructor.

SOCIOL 3G03 SOCIOLOGY OF HEALTH CARE
Selected issues concerning forms of providing health care.
3 hrs. (lects. and discussion); one term
Prerequisite: Sociology 1A06; or permission of the instructor.
Enrolment is limited.

SOCIOL 3GG3 SPECIAL TOPICS IN THE SOCIOLOGY OF DEVIANCE
An advanced course allowing detailed study of selected topics in the Sociology of Deviance.
Topics will vary from year to year.
3 hrs. (lects. and discussion); one term
Prerequisite: Sociology 2C06.

SOCIOL 3H06 RESEARCH TECHNIQUES AND DATA ANALYSIS
A comprehensive introduction to the principles of research methods and data analysis in the social sciences.
3 hrs. (lects. and labs.); two terms
Prerequisite: Sociology 1A06; or permission of the instructor.

SOCIOL 3HH3 SOCIOLOGY OF HEALTH
Sociological approaches to the study of health and illness.
3 hrs. (lects. and discussion); one term
Prerequisite: Sociology 1A06; or permission of the instructor.
Enrolment is limited.

SOCIOL 3I03 SOCIOLOGICAL INQUIRY
An examination of the issues of explanation that separate positivist sociology from subjectivist-historical sociology and critical-marxist sociology. The course focuses on the issues which link social theory and methodology.
3 hrs. (lects. and discussion); one term
Prerequisite: Registration in any Honours programme in Sociology; or permission of the instructor.

SOCIOL 3J03 SPECIAL TOPICS IN SOCIOLOGICAL ANALYSIS I
An examination of selected topics of contemporary interest to sociologists. Students should consult the Department concerning the topics to be examined.
3 hrs. (lects. and discussion); one term
Prerequisite: Sociology 1A06; or permission of the instructor.

SOCIOL 3K03 SPECIAL TOPICS IN SOCIOLOGICAL ANALYSIS II
Same as Sociology 3J03.
3 hrs. (lects. and discussion); one term
Prerequisite: Sociology 1A06; or permission of the instructor.

SOCIOL 3L03 SELECTED TOPICS IN OCCUPATIONAL SOCIOLOGY
An advanced course allowing detailed study of one or more topics of special interest.
3 hrs. (lects. and discussion); one term
Prerequisite: Sociology 1A06; or permission of the instructor.

SOCIOL 3LL3 SOCIOLOGY OF WORK AND LABOUR MARKETS
A consideration of the manner in which labour markets are stuctured and how they influence the access that people have to employment.
3 hrs. (lects. and discussion); one term.
Prerequisite: Sociology 1A06; or permission of the instructor.

SOCIOL 3M06 RELIGION AND MODERN SOCIETY
An introduction to the thoughts and theories of scholars who have studied the relation between religion and society. In the first term, the emphasis will be on pre-World War II writings. In the second term, the empirical materials of the sociology of religion since World War II will be surveyed.
3 hrs. (lect. and discussion); two terms
Prerequisite: Any course in Anthropology, Philosophy, Religious Studies or Sociology.
Same as Religious Studies 3J06.

SOCIOL 3N03 THE SOCIOLOGY OF KNOWLEDGE AND CULTURE
An analysis of the origins, development and functions of ideas, images, and other cultural representations through which knowledge about society, its institutions and practices is formed, distributed and used.
3 hrs. (lects and discussion); one term
Prerequisite: Sociology 1A06; or permission of the instructor.

SOCIOL 3O03 ADVANCED SOCIOLOGICAL RESEARCH
This course will provide a detailed study of selected qualitative methods in Sociology.
3 hrs. (lects. and discussion); one term
Prerequisite: Sociology 1A06, or permission of the instructor.

SOCIOL 3P03 AMERICAN SOCIOLOGICAL THEORY
An advanced examination of classical and contemporary American sociological theory.
3 hrs. (lects. and discussion); one term
Prerequisite: Sociology 2S03 or 2S06; or permission of the instructor. Not open to students with credit in Sociology 3A06.

SOCIOL 3PP3 CANADIAN SOCIOLOGICAL THEORY
An examination of the more or less unique contributions of French and English Canadians to sociological theory. Emphasis is on the Laval and Toronto schools, and their left-nationalist progeny and critics.
3 hrs. (lects. and discussion); one term
Prerequisite: Sociology 2S03 or 2S06 or permission of the instructor.

SOCIOL 3Q03 NATIVE AND ETHNIC RELIGIONS IN CANADA
A study of the effect of religion on native and ethnic identity, frontier religion and the new sects and cults.
2 lects., 1 tut.; one term
Prerequisite: Any course in Anthropology, Philosophy, Religious Studies, Sociology.
Same as Religious Studies 3B03.

SOCIOL 3R03 RELIGION AND IDENTITY
An examination of the roles or functions of religion in the development of personal and group identities, using both empirical and theoretical materials.
2 lects. 1 tut.; one term
Prerequisite: Open.
Not open to students with credit in Religious Studies 3R03.

SOCIOL 3S03 CREATIVITY AND HUMAN INTERACTION
A study of the motivations of some representative writers, and of the psychological processes in literary creativity. Psychoanalytic and psychiatric contributions to understanding the subject will be considered.
3 lects.; one term
Prerequisite: Permission of the instructor. Not open to students with credit for this topic if taken as English 3KK3.
Same as English 3F03 and Social Science 3B03.

SOCIOL 3T03 THE SOCIOLOGY OF URBAN AREAS
Sociological analysis of urban structure and development, and the social consequences of urbanization.
3 hrs. (lects. and discussion); one term
Prerequisite: Sociology 1A06; or permission of the instructor.

SOCIOL 3U06 THEORIES OF MASS SOCIETY
A careful study of a few books by writers who have looked at the possible tension between equality and liberty in the modern world and at the problem posed for constitutional democracy by 'mass' cultural and political phenomena.
3 hrs. (lects. and discussion); two terms
Prerequisite: Sociology 1A06; or permission of the instructor.
Same as Political Science 3LL6.

SOCIOL 3V03 SELECTED TOPICS IN COMPARATIVE INDUSTRIAL SOCIETIES
The similarities and differences of various modern industrial societies will be examined through discussion of various postulated determinants of the structure and processes of such societies.
3 hrs. (lects. and discussion); two terms
Prerequisite: At least 18 units of Sociology including Sociology 1A06; or permission of the instructor. Not open to students with credit in Sociology 2F06, or 3V06.

SOCIOL 3W03 HISTORICAL METHODS IN SOCIOLOGY
An examination of methods for incorporating historical data and archival sources into sociological argument.
3 hrs. (seminar and discussions); one term
Prerequisite: Sociology 1A06; or permission of the instructor.

SOCIOL 3X03 SOCIOLOGY OF AGING
This course deals with changing population structure, economic support of the aged, family of later life, the sociology of retirement, widowhood, death, bereavement, and institutionalization.
3 hrs. (lects. and discussion); one term
Prerequisite: Sociology 1A06; or permission of the instructor.

SOCIOL 3Y03 THE SOCIOLOGY OF ORGANIZATIONS II
An advanced course which allows detailed examination of relevant theories and research, including those to which the student was introduced in Sociology 2I03.
3 hrs. (lect. and discussion); one term
Prerequisite: Sociology 2I03; or permission of the instructor.

SOCIOL 3Z03 ETHNIC RELATIONS
An analysis of political, social and economic change in selected locales.
3 hrs. (lects. and discussion); one term
Prerequisite: Sociology 1A06; or permission of the instructor.

SOCIOL 4B06 FIELD STUDY METHODOLOGY
This course provides students an opportunity to engage in first hand sociological research using field study methods, particularly participant observation.
3 hrs. (seminar); two terms
Prerequisite: Registration in Level IV Honours Sociology; or permission of the instructor.

SOCIOL 4C06 SELECTED PROBLEMS IN SOCIOLOGICAL RESEARCH
Students will undertake a class project which involves quantitative materials.
3 hrs. (seminar); two terms
Prerequisite: Sociology 3H06.

SOCIOL 4D03 CRITIQUES OF SOCIOLOGICAL THEORY
A discussion of various sociological and non-sociological critiques of sociological theory.
3 hrs. (seminar); one term
Prerequisite: Registration in Level IV Honours Sociology and Sociology 2S03 or 2S06; or permission of the instructor.

SOCIOL 4F03 SPECIAL TOPICS IN COMPARATIVE SOCIOLOGICAL RESEARCH I
A critical discussion, centering on selected books and articles, of various strategies using comparative methods for studying societies.
3 hrs. (seminar); one term
Prerequisite: Registration in Level IV Honours Sociology and Sociology 2M06; or permission of the instructor.

SOCIOL 4H03 SELECTED TOPICS IN THE SOCIOLOGY OF ORGANIZATIONS
An advanced course allowing detailed study of aspects of organizational analysis of special interest.
3 hrs. (seminar); one term
Prerequisite: Registration in Level IV Honours Sociology and Sociology 2I03; or permission of the instructor.

SOCIOL 4I03 SPECIAL TOPICS IN SOCIOLOGICAL THEORY
An advanced critical analysis of special topics/issues in sociological literature. The content of this course will vary from year to year; please consult the departmental handbook.
3 hrs. (seminar); one term
Prerequisite: Sociology 2S03 or 2S06, and registration in Level IV Honours Sociology; or permission of the instructor.

SOCIOL 4J03 SELECTED TOPICS IN SOCIOLOGY I
Topics of contemporary interest to sociologists, with emphasis upon current theory and research. Students should consult the Department concerning the topics to be examined.
3 hrs. (seminar); one term
Prerequisite: Registration in Level IV Honours Sociology; or permission of the instructor.

SOCIOL 4K03 SELECTED TOPICS IN SOCIOLOGY II
Same as Sociology 4J03.
3 hrs. (seminar); one term
Prerequisite: Registration in Level IV Honours Sociology; or permission of the instructor.

SOCIOL 4L03 SPECIAL TOPICS IN COMPARATIVE SOCIOLOGICAL RESEARCH II
Same as Sociology 4F03.
3 hrs. (seminar); one term

SOCIOL 4M03** DIRECTED RESEARCH I FOR HONOURS STUDENTS
Directed study of a research problem through published materials and/or field inquiry and/or data analysis. Students will be required to write up the results of their inquiry in scholarly form.
One term
Prerequisite: Permission of the instructor and registration in Level IV Honours Sociology; or permission of the Department.

SOCIOL 4N03** DIRECTED RESEARCH II FOR HONOURS STUDENTS
Same as Sociology 4M03.
One term
Prerequisite: Permission of the instructor and registration in Level IV Honours Sociology; or permission of the Department.

SOCIOL 4O03 REGIONALISM AND REGIONAL DEVELOPMENT IN CANADA
An examination of regional divisions and disparities in Canada as a social, cultural and economic phenomenon. Emphasis will be placed on the causes of uneven development in Canada, and the impact of regional development policy on the society and economy of Canada's regions.
3 hrs. (seminar); one term
Prerequisite: Sociology 2H06; or permission of the instructor.

SOCIOL 4Q03 INDIVIDUAL AND SOCIETY I
An intensive examination of selected problems involving the relationship of individuals to social structures.
3 hrs. (seminar); one term
Prerequisite: Registration in Level IV Honours Sociology; or permission of the instructor.

SOCIOL 4R03 INDIVIDUAL AND SOCIETY II
An intensive examination of selected problems involving the relationship of individuals to social structures.
3 hrs. (seminar); one term
Prerequisite: Registration in Level IV Honours Sociology; or permission of the instructor.

SOCIOL 4S03 SPECIAL TOPICS IN CANADIAN SOCIETY I
An examination of questions which have sociological relevance for Canadian society. The specific questions may vary in different years.
3 hrs. (seminar); one term
Prerequisite: Registration in Level IV Honours Sociology; or permission of the instructor.

SOCIOL 4T03 SPECIAL TOPICS IN CANADIAN SOCIETY II
An examination of questions which have sociological relevance for Canadian society. The specific questions may vary in different years.
3 hrs. (seminar); one term
Prerequisite: Registration in Level IV Honours Sociology; or permission of the instructor.

SOCIOL 4V06 SPECIAL TOPICS IN RACIAL AND ETHNIC RELATIONS
A study of the impingement of ethnic and racial factors upon the political process in comparative contexts, but focusing principally on South Africa.
3 hrs. (seminar); two terms
Prerequisite: Registration in Level IV Honours Sociology; or permission of the instructor.
Same as Political Science 4D06.

SOCIOL 4X03 LABOUR AND SOCIETY

The course will focus on the emergence of labour organizations during the course of modernization and the factors determining the political outlook of labour.

3 hrs. (seminar); one term

Prerequisite: Registration in Level IV Honours Sociology; or permission of the instructor.

For **Graduate Courses** see *Calendar, School of Graduate Studies.*

Spanish

(See *Hispanic Studies*)

Statistics

(See *Mathematics and Statistics*)

Academic Services and Research Facilities

Academic Services

THE UNIVERSITY LIBRARY

G.R. Hill, B.A.(*Newcastle*), M.A.(*Lancaster*),
M.L.S.(*Western*)/*University Librarian*

The University Library System consists of Mills Memorial Library (Arts), the Innis Room in Kenneth Taylor Hall which contains a collection of Business materials, the H.G. Thode Library of Science and Engineering, the Lloyd Reeds Map Library/Urban Documentation Centre located in the Burke Science Building and the Health Sciences Library housed in the Health Sciences Centre. Union catalogues covering all libraries are available and stacks are open to all library users.

The collection in 1988 contained over 1,470,000 volumes, 1,120,000 microform items, 172,000 non-print items and 2,000 linear metres of archival material. There is a substantial collection of government publications and current periodical titles number over 14,500.

To help readers, service is maintained at key points such as Reference and Periodicals in the various libraries. Introductory library tours and subject related seminars are given and pamphlets describing the hours and services of the different areas are available.

The William Ready Division of Archives and Research Collections in Mills Library contains rare books, manuscripts and special book and archival collections which afford many opportunities for original research. Of outstanding interest are the Bertrand Russell Archives, a massive collection of correspondence and manuscripts supported by books, journal articles, secondary literature, tapes, films and personal memorabilia. The 30,000 volume collection of eighteenth-century British material is the major Canadian collection in the field, and has been complemented for over twenty years by the lectures, seminars and publications of the McMaster Association for Eighteenth-Century Studies. Library fellowships in Eighteenth-Century Studies are being offered annually. Among more modern materials are the papers of Vera Brittain, Marian Engel, Anthony Burgess, Pierre Berton, Farley Mowat, Peter Newman, Matt Cohen and many others. Business interests are reflected in such files as the General Steel Wares Archives, the Macmillan of Canada Archives, and the McClelland and Stewart Archives. Canadian social and political interests are documented in papers from the Canadian Union of Students, the Canadian Youth Congress, the SUPA/CUCND papers and other related collections. There are holdings of the records of a number of labour unions including U.S.W.A. Local 1005, U.S.W.A. District 6, United Glass and Ceramic Workers (Canada) and the Hamilton and District Labour Council.

Publications

McMaster University Library Research News
Russell, the Journal of the Bertrand Russell Archives
Monographs with the imprint of the McMaster University Library Press.

Staff

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Stewart, Charlotte A., B.A. (*Toronto*), M.L.S. (*Western*)/Director of Archives and Research Collections
Thomson, Donna K., B.A. (*York*), M.L.S. (*Toronto*)/Catalogue Standards Librarian, Processing Services
Tooke, Elaine M., B.A., M.L.S. (*Western*), M.Sc. (*Dalhousie*)/Reference Librarian, Science & Engineering
Trainor, Mary Anne, B.A. (*McMaster*), M.L.S. (*Toronto*)/Acquisitions and Serials Librarian, Health Sciences
Winch, John/Library Preservation Specialist

COMPUTING AND INFORMATION SERVICES: C.I.S.

Drake, John, M.A., M.Sc., Ph.D./*Assistant Vice-President, C.I.S.*
Gowland, Doug, C.A., C.M.C./*Director, Computing & Information Services*

Computing Services

Bryce, Jim, B.Sc./*Assistant Director, Computing Services*
Griffin, Robin, B.Sc., Ph.D./*Manager, User Services*
Hicks, Graham, M.Sc., P.Eng./*Manager, Technical Services*
Zsiros, Lloyd/*Supervisor, Micro Systems Support*
Beckberger, Brian, B.Math./*Supervisor, Systems Software Group*
Walker, David/*Computer Education Co-ordinator*

Information Services

Dietsche, Helen, B.A./*Manager of Application Maintenance*
O'Day, Pat/*Manager, Operations and Technical Support*
Matson, Rick/*Supervisor, Operations*
Masterson, John, B.Sc., M.B.A./*Manager, Information Systems Services*
Gowan, Wayne, B.Sc./*Programming Supervisor*
Grigg, Heather, *Personal Computing Support Co-ordinator*

Administration

Yacobino, Barb, B.A./*Administrative Co-ordinator, C.I.S.*

C.I.S. provides computing services in support of both academic (teaching and research) and administrative activities. The facilities available for *academic* use include a VAX 8650 with a FPS 264 array processor, two Vax 11/780, an IBM VM system, an IBM MVS system as well as several microcomputer laboratories. C.I.S. manages a campus-wide Ethernet and ROLM data service as well as a number of associated communication services such as Datapac access and off-campus networks including access to the CRAY supercomputer at University of Toronto. *Adminstrative* computing is run on an IBM MVS system, an IBM VM system and a VAX 11/785 computer. Other adminstrative systems on campus include an IBM 8130 and many standalone and networked microcomputers.

Student time-sharing terminal and microcomputer areas are located in the Burke Sciences Building, Rooms 240-245, the John Hodgins Engineering Building, Room 234A, the Arthur Bourns Building, Room 166 and in the Kenneth Taylor Hall, Rooms B110, B120 and B123. Student consultants are available to assist users in each of these terminal areas. Assistance is also available in the main C.I.S. office located in Burke Sciences Building, Room 246. Each faculty has a Service Co-ordinator to assist faculty members who is familiar with that faculty's particular requirements.

C.I.S. provides seminars and short non-credit courses. Other courses relating to computers and computing are offered by the Depatment of Computer Science and Systems, the Science Resource and Training Centre and through the Centre for Continuing Education.

C.I.S. services for the University community include a computer conference service, (VAX notes), an electronic mail system (PROFS) and access to Netnorth, a worldwide University network. C.I.S. also administers a number of University site licences for software such as SAS, SPSS, Tex, the Watcom programmes and provides access to public domain software.

In addition to the facilities operated by C.I.S., there are numerous minicomputers and micro-processors located in Departments to support academic programmes.

UNIVERSITY ART GALLERY

K.G. Ness, B.A., M.Litt., MMST/*Curator*
G. Loveys, B.A./*Curatorial Assistant*
J. Petteplace, B.A./*Gallery Technician*

Opened in 1967, the University Art Gallery is located in Togo Salmon Hall, Room 114. With two galleries of over 3,000 square feet, it has all the professional facilities for a year-round programme of exhibitions, either organized by McMaster or loaned to the University by such organizations as the National Gallery of Canada and the Art Gallery of Ontario.

The Permanent Collection consists of approximately 3,000 Canadian and European art works with a specialized collection of over 190 German Expressionist prints.

The Gallery is open daily except Mondays and Saturdays. Call Local 3081 for further information.

THE INSTRUCTIONAL DEVELOPMENT CENTRE

A.C. Blizzard, B.Sc., M.Sc., Ph.D./*Director*
D.E. Roy, B.A., M.A./*Educational Consultant*
D.J. MacLellan, B.S.W., M.S.W./*Educational Consultant*
S. Riselay, *Secretary*

The Instructional Development Centre (IDC) is a resource centre for people who teach at McMaster: individual faculty members and teaching assistants (tutors, demonstrators, markers) as well as departments and other groups.

The Centre works closely with the University Committee on Teaching and Learning. This group, which includes a representative of the M.S.U. Teaching Awards Committee, two graduate students and faculty members from all six Faculties, provides policy guidance for the Centre, makes recommendations to the University on issues affecting teaching and learning conditions and provides grants for teaching and learning development projects. The Centre's activities include:

Teaching and Learning Grants: The IDC consults with applicants on their proposals and assists them with projects. It also provides administrative services for the Grants program.

Programmes for Teaching Assistants: The Centre plans and organizes TA-Day, a campus-wide orientation programme for teaching assistants. It also offers a series of short courses on teaching for senior Ph.D. students.

Workshops, Seminars and Conferences: A wide variety of events is offered, conducted by McMaster faculty, visiting resource people and IDC staff. Generally, the topics are ones requested by instructors or departments or are reports by people who have completed Teaching and Learning Grant projects. Subjects typically include research on learning and teaching methods, lecturing, small group discussion, simulations and the use of microcomputers in education.

Consultation: A major part of the Centre's work is discussing current courses with instructors. The instructor or department provides the expertise in the course content. The Centre provides information on ways for instructors to evaluate and refine courses. It also arranges contacts with other experienced people and assistance in trying new approaches.

The Centre has a long history of collaboration with student efforts to support excellence in teaching. For example, the IDC provided consultation on refinements to the MSU Teaching Awards program and the MSU Handbook *The Disabled Student* as well as on grants the MSU has received for its own teaching and learning projects.

Resources: The IDC has a library of books on university teaching and learning, example audio-visual materials and microcomputer programmes. It also has video-tape equipment (for use in workshops and for taping classes at the request of instructors) and some microcomputer equipment for familiarization seminars and for faculty to use in evaluating educational software.

Students, especially those working as teaching assistants, are invited to visit the Centre, in General Sciences, Room 217, telephone ext. 4540.

AUDIO VISUAL SERVICES

McMaster Audio Visual Services provides a complete media service to faculty, staff and students at McMaster. These services include: television production, editing and tape duplication; audio recording, tape and cassette editing, high speed tape duplication; A/V equipment distribution (all kinds of projectors, audio and video tape recorders, etc.); film reservations; A/V equipment repair; graphic art - for design, charts and graphs for publication, display or poster presentations, computer graphics - B/W laser prints/high resolution 35 mm colour slides; photography including location and studio photography, black and white or colour copy, film processing and slide duplication.

For further information, please refer to the A/V Services located in the Health Sciences Complex, Room 1G1, telephone ext. 2301, or Burke Sciences Bldg., Room B231, telephone ext. 2761.

Research Facilities

ONTARIO CENTRES OF EXCELLENCE

In June 1987, seven *Centres of Excellence* were designated by the Ontario provincial government. Each Centre acts as a network to promote a cooperative research environment between the Ontario university community and the business/labour community. McMaster is participating in three of these Centres, based on existing research strengths.

Centre for Materials Research

The research programme of this Centre will focus on biomaterials, microstructures, polymers and composites, optoelectronics, and the microscopic study of the interface between materials surfaces.

Manufacturing Research Corporation of Ontario

The MRCO will provide a basic research centre for the development of pre-competitive generic manufacturing technology, with special emphasis on Computer Integrated Manufacturing.

Telecommunications Research Institute of Ontario

In response to the growth in demand for transmission of voice, data and pictorial information, the work of this Centre will concentrate on multi-service digital networks, radar systems, mobile and satellite systems, photonic networks and systems, and electromagnetic compatibility.

THE ACCOUNTING RESEARCH AND EDUCATION CENTRE

Haim Falk, B.Ac., M.B.A., Ph.D., C.P.A./*Director*

The Accounting Research and Education Centre was established in May 1985 and is jointly funded by the Certified General Accountants Association of Ontario and McMaster University.

It is located in Kenneth Taylor Hall, Room 109 and directed by Dr. Haim Falk, the holder of the Distinguished Professorial Chair in Accounting. The routine operation of the Centre is governed by its Operating Committee which consists of the Dean of the Faculty of Business, the Chairman of the Accounting Area, and the Director.

The Centre is extensively engaged in activities which are aimed to enhance quality research in the field of accounting. It provides direct and indirect research support to members of the Faculty of Business. The Centre sponsors scholarly seminars for members of the Faculty of Business as well as a public annual Distinguished Speaker Series, to which noted academics, and renowned professionals are invited to give public lectures.

The Centre actively supports seminars and research conferences such as the annual conference of *Contemporary Accounting Research*, the scholarly journal of the Canadian Academic Accounting Association. The Journal's editor is a member of the Accounting Area in the Faculty of Business. As a service to the professional accounting community the Centre provides summaries of published articles to members of the Certified General Accountants Association of Ontario.

McMaster University and the Accounting Research and Education Centre are deeply committed to increasing the excellence of accounting research and education.

CENTRE FOR ELECTROPHOTONIC MATERIALS AND DEVICES

Dr. D.A. Thompson, BSc., Ph.D./*Director*

The Centre for Electrophotonic Materials and Devices (CEMD) has been established in order to enhance research into new semiconductor devices and device structures associated with optical data transmission and processing. Materials research problems associated with all technologies required to develop suitable integrated optics systems are being studied. Devices, both high speed electronic and optoelectronic are being designed and characterized. The objectives are to attain improved performance of communications systems as a result of integrating semiconductor light sources, detectors and waveguides on the same substrate along with active electronic components. This so-called third phase of semiconductor development requires specialized equipment, trained manpower and an understanding of the basic sciences governing the performance of the elements involved. Within the CEMD we have in place, or are acquiring, most of the state-of-the-art equipment necessary for such research. A central focus for our programme will be a unique Molecular Beam Epitaxy (MBE) system involving in-situ ion beam modification and on-line ion beam analysis. The MBE system itself is designed for the (Ga,In) (As,P) group of materials and growth will utilize a hybrid system involving effusion cells as sources for Ga and In and gas cracking cells for the As and P. Ion beam processing during growth will allow us to study nucleation kenetics, improve stoichiometry and dope with eV dopant ions. Many other facilities are available and work is being carried out on ion implantation, ohmic and Shottky contacts, optical waveguides, device failure processes and laser processing.

Current CEMD manpower includes seven faculty and seven research professionals and technicians. This is expected to increase by at least three faculty and by two researchers and three technicians in the next two years.

CENTRE FOR FLEXIBLE MANUFACTURING RESEARCH AND DEVELOPMENT

Dr. Hoda A. ElMaraghy, B.Eng., M.Eng., Ph.D., P.Eng./*Director*

Flexible automation is a key factor in improving manufacturing productivity, competitiveness and product quality and reducing production cost. It increases the flexibility and ability of companies to respond to changing market demands and product design. The Centre for Flexible Manufacturing Research and Development was established at McMaster University in recognition of the strategic importance of flexible automation to the Canadian discrete parts manufacturing sector. A contribution of $500,000 was granted in August 1984 by the Canadian Federal Government, as part of the Centres of Specialization Fund, to launch the project.

The activities of the Centre are multi-disciplinary which combine mechanical and electrical engineering, computing, and management expertise. The mandate of the Centre is to conduct basic and applied research in flexible manufacturing, develop human resources through graduate and undergraduate education and cooperate with industry for effective technology transfer.

The Centre contains a flexible assembly cell with two robots, computer controlled material handling, computer vision system, force and tactile sensors, laser inspection system and various computing facilities. Researchers in the Centre are involved in various industry and government supported research projects for design and simulation of flexible manufacturing systems, product design for ease of assembly, computer vision applications, sensory based robotic assembly, expert systems and artificial intelligence, modelling, control and off-line programming of robots, production scheduling, automated inspection and design automation. The Centre employs four full-time researchers and a half-time secretary. Ten Masters and Doctoral students, on the average, pursue their studies in the Centre, and research funding in 1988/89 exceeded $600,000. The Director, Professor ElMaraghy, is a principal investigator in the Manufacturing Research Corporation of Ontario (MRCO)-a Centre for Research Excellence.

CENTRE FOR HEALTH ECONOMICS AND POLICY ANALYSIS

Dr. G.L. Stoddart/*Co-ordinator*
Professor J. Lomas/*Associate Co-ordinator*

CHEPA is a multidisciplinary Centre, located in the Faculty of Health Sciences, created to stimulate and conduct research in health economics and health policy analysis, to provide training opportunities in these fields and to improve the exchange between researchers and policy-makers. The Centre's research, education and service activities bring together on a project basis faculty and staff from several departments and faculties on campus including Clinical Epidemiology and Biostatistics, Economics, Political Science, Geography and Business. Specific research objectives of the Centre include the development and application of methods to evaluate the costs, risks, benefits and utility of specific health services; the design and evaluation of different systems of organization and financing for the delivery of health and health care services; and the study of the behaviours of consumers, providers and other decision-makers in the health and health care systems. The Centre organizes and sponsors a variety of academic activities including research seminars, policy seminars, continuing education workshops, a health policy commentary series and an annual health policy conference.

COMMUNICATIONS RESEARCH LABORATORY

Simon Haykin,B.Sc., P.H.D., D.Sc., F.R.S.C., F.I.E.E.E./*Director*

The Communications Research Laboratory (CRL) operates in the Faculty of Engineering. It has a membership of 14 faculty, 17 full-time research staff, 3 technical staff, 6 managerial/administrative/clerical staff and a graduate student population of over 45 students.

The research programme of the CRL is devoted to signal processing, technologies and devices applied in the areas of microwaves, antennas, optics, high-speed networks, radar, sonar, digital radio, monolithic microwave integrated circuits, very large scale integration and expert systems. The CRL has pioneered many new theoretical concepts and system designs with practical applications. Indeed, the CRL has established itself as one of the leading centres of research in signal processing and digital communications for which it is recognized both nationally and internationally. In late 1987, CRL became a founding member of the Telecommunications Research Institute of Ontario (TRIO), a provincial Centre of Excellence.

The CRL has established invaluable links with many government research laboratories and companies. It derives its funding from research grants awarded by the Natural Sciences and Engineering Research Council, and contracts with government, TRIO and industries. CRL's total revenue is in excess of 2.5 million dollars per annum. The CRL building was recently expanded to 20,000 square feet.

In the formation of its research programmes and activities, the CRL is assisted by an Advisory Committee with membership drawn from government agencies and the electronics and telecommunications industry of Canada.

GERONTOLOGICAL STUDIES

There are four components of Gerontological Studies at McMaster: the Office for Gerontological Studies; the Educational Centre for Aging and Health; the R. Samuel McLaughlin Centre for Gerontological Health Research; and the Honours B.A. and B.A. programmes in Gerontology and Another Subject.

Office of Gerontological Studies

Dr. Ellen B. Ryan, B.A, M.A., Ph.D/*Director*
Professor Karl Kinanen, Dipl.S.W., B.A., M.S.W./*Associate Director*

This office co-ordinates multi-disciplinary and multi-faculty initiatives in education and research in gerontology. The scope of the office encompasses both the University and the community, with the office acting as a forum for the exchange of information about all gerontological activities at McMaster and also about various aspects of aging.

The office's activities are supported by University funding, while specific projects are funded by public agencies and private foundations.

The Honours B.A. and B.A. programmes in *Gerontology and Another Subject* are administered by this office. The B.A. programmes are described in this Calendar in the section *Faculty of Social Sciences, Gerontological Studies*. Students may contact the Office for information on education and research in gerontology, and health and social services available for an aging population.

Educational Centre for Aging and Health

Dr. A.(Sandy) Macpherson, M.D., M.Sc./*Director*

The mission of the Centre is twofold: to increase the proportion of skilled health professionals who are committed to providing excellent care for aging individuals; and to develop effective collaborative educational approaches and models concerning aging and health. This is being accomplished by stengthening the gerontological input in educational programmes, especially continuing education of practicing health professionals. Aside from continuing education, other educational programmes include: Undergraduate Programmes for Professionals, namely the M.D., B.Sc.N., B.H.Sc. (O.T./P.T.) and B.S.W. (Social Work) programmes; Post-graduate (Residency) Education; Graduate Education (M.Sc., M.H.Sc., and Ph.D.); B.A. Programme in Gerontology (Faculty of Social Sciences); and the M.B.A. programme - Health Services Management Stream (Faculty of Business).

Students interested in further information should consult directly with the specific programme office of interest.

R. Samuel McLaughlin Centre for Gerontological Health Research

Larry W. Chambers, Ph.D./*Director*

The objectives of The R. Samuel McLaughlin Centre for Gerontological Health Research are as follows:

1. support research training of persons with expertise in caring for seniors and to recruit research faculty for the Faculty of Health Sciences;
2. initiate research activities aimed at improving health care for the elderly in Canada that include promotion of health and preventive care;
3. sponsor educational conferences with guest speakers which will integrate non-proprietary and proprietary health care providers and government health care perspectives. (University faculty, health care managers, service providers and government officials are invited to participate in such workshops);
4. publish periodical reports on the Centre's activities, and distribute these to supporters of the Centre, health care agencies, and government divisions which have a gerontological health care interest;
5. disseminate new knowledge about gerontological health care through publications, professional conferences, workshops and other forms of continuing education.

The R. Samuel McLaughlin Centre for Gerontological Health Research consists of an Executive Committee that oversees the activities of the Centre, a Fellowship Committee that selects research fellows, and a Faculty Recruitment Committee that makes recommendations for new faculty researchers to the Faculty of Health Sciences. Faculty members on these committees are from those Departments in the Faculty of Health Sciences which have begun to develop a resource pool of researchers in gerontology.

McMASTER INSTITUTE FOR ENERGY STUDIES

Dr. M.L. Kliman/*Director*

The Institute was established in 1980 by a group of engineers, scientists and social scientists at McMaster who recognized the inter-disciplinary nature of the problems involved in producing and using energy. Its purpose is to co-ordinate, promote and support energy research and energy education. The MIES office collects and disseminates information on economic, political, scientific and technological developments relating to energy; provides aid in the organization and finance of research projects; organizes seminars and conferences; and publishes the *Energy Studies Review* three times yearly.

McMASTER INSTITUTE FOR MATERIALS RESEARCH

A.J. Berlinsky, M.Sc., Ph.D./*Director*

Research in the physics, chemistry, metallurgy and engineering of solid materials is supplemented through a multidisciplinary Institute for Materials Research. Fifty-two faculty members from ten academic departments in the faculties of science and engineering, as well as graduate students and research fellows associated with them, share research space and facilities in the John Hodgins Engineering, Nuclear Research and A.N. Bourns Science Buildings. The facilities provided by the Institute include a high-temperature materials preparation laboratory, single-crystal and powder X-ray diffractometers, an extensive collection of analytical instruments (DTA, TGA, DSC, etc.), an array of modern electron microscropes (SEM, TEM, STEM, and SAM) and an eletronics instrument development facility, all operated and maintained by a highly trained team of technical staff.

McMASTER INSTITUTE FOR MOLECULAR BIOLOGY AND BIOTECHNOLOGY

Dr. J.A. Hassell, B.Sc., Ph.D./*Director*

The purpose of the Institute is to promote and strengthen research and teaching in molecular biology at the University, and to develop links with industry so that research ideas can be exploited commercially. Research in molecular biology is an active focus for faculty members in departments within the Faculties of Science, and Health Sciences and includes: regulation of gene expression, differentiation, membrane and organelle biogenesis, viral oncology and modes of viral replication, and applied topics such as development of monoclonal antibodies and recombinant DNA techniques for diagnostic purposes. The Institute brings faculty members in these research areas together to exchange ideas and techniques. It also allows the development of new areas of research and serves to foster the research of biologists not at present using the techniques of molecular biology. As a part of these roles, the Institute operates a central laboratory facility and serves as a teaching resource for graduate and senior undergraduate courses in molecular biology and biotechnology.

McMASTER INSTITUTE FOR POLYMER PRODUCTION TECHNOLOGY

Dr. A.E. Hamielec/*Director*
Dr. J.F. MacGregor/*Associate Director*

Polymers are found in products which affect every aspect of our lives: synthetic fibres; latex in paints and adhesives; specialty polymer coatings; synthetic rubbers; contact lenses; bio-medical implants; baby diapers.

The McMaster Institute for Polymer Production Technology (MIPPT) is a research institute that places a major emphasis on reaction engineering and computer process control of industrial polymer production processes. This has resulted in a current roster of industrial members which includes 15 of the world's leading polymer companies: Akzo Chemie (Netherlands); Canadian Oxy Chemicals; DSM (Netherlands); Esso Chemical Canada; GenCorp (formerly General Tire); B.F. Goodrich; Goodyear; ICI (British parent company of CIL); S.C. Johnson & Son; Nalco Chemical; Neste Oy (Finland); Polyresins; Polysar/Nova; Grupo Primex (Mexico); Rohm & Haas; Union Carbide.

Eighteen faculty members from the Departments of Chemical Engineering, Chemistry, Mechanical Engineering and the Faculty of Business are associated with the Institute as well as 21 graduate students, 5 post doctoral fellows, 4 visiting scientists, 2 research associates, and 9 support staff.

The Institute facilities include: a fully instrumented, computer controlled pilot plant with 7 stainless-steel reactor vessels; local control computers and access to a VAX for computer control and computer simulation studies; advanced analytical facilities that allow the complete characterization of polymer samples; an ampoule laboratory in which small-scale studies are performed.

There are currently 30 research projects underway in the areas of: mathematical modelling for the purpose of predicting the behaviour of industrial processes and thereby developing improved or completely new pocesses; industrial control of polymer plants; studies of water soluble polymers (for example, for fines retention in the pulp and paper industry); research on a novel high temperature process for the production of specialty copolymers used in the coatings industry; development of polymer reactor models for safety calculations; an investigation of reaction injection moulding (RIM) of thermoplastics as an alternative to the traditional methods of producing molded polymer parts (such as for the automobile industry); polymer modification in extruders; methods development for the characterization of polymers.

MCMASTER INTERNATIONAL

Dr. Gary Warner/*Director*
Ms. Iona Campagnolo/*Associate Director*

In recent years, McMaster University has become increasingly involved around the world in exchange agreements, institutional linkages and externally-funded international programmes concerned with collaborative research, with the training of professional people and with improving the delivery of services in such sectors as business, environmental protection, community health and engineering. At the same time, the university has been receiving a growing number of requests for collaboration from post-secondary institutions and governments in many countries. McMaster International was created in 1988 in response to the need for a co-ordinated approach to the international activities of the university. The vision of McMaster International is to promote global social equity and to be guided by the principles of partnership, human rights and environmental protection.

The specific functions of McMaster International are as follows:

1. Encourage and co-ordinate multidisciplinary initiatives in international education and scholarship across all academic units of the University;
2. Facilitate the involvement and support of faculty, staff and students from all parts of the University in international acitivities;
3. Foster partnerships between the University and external groups, including industry and non-governmental organizations, in undertaking international acitivities;
4. Serve as the communication centre concerning international activities at McMaster;
5. Maintain and disseminate information within the University about international programmmes and opportunities.

McMASTER MANAGEMENT OF TECHNOLOGY AND INNOVATION INSTITUTE

Walter F. Petryschuk, P.Eng., Ph.d./*Director*

The McMaster Management of Technology and Innovation Institute is a co-operative industry/university centre focusing on the management of technology. The Institute has been created as a resource centre of expertise in response to the technology challenge that Canadian industry faces in the years ahead. Funded through the federal government and industry contributors, the Institute has been designed with the close co-operation of industry. A Board of Directors, composed of senior managers from leading Canadian firms and representatives from McMaster and other institutions now guides the centre, and also provides financial support.

To meet the need for better management of technology in Canada, the Institute has been designed to have three major roles:

1. instruction in technology strategies, new products, and new process technology. Training will be given through the longer term executive seminars, and degree programmes at the graduate and undergraduate levels;
2. research into the processes which underlie successful new product and new process development, commercialization and implementation. Such research will focus on topics that are judged to be relevant to Canadian business managers;
3. collection of knowledge, skills and resources from abroad and their dissemination to Canadian business. The Institute will act as the Canadian link to similar centres in Europe, the U.S., and the Far East.

MCMASTER NUCLEAR REACTOR (MNR)

Collins, Malcolm F., M.A., Ph.D./*Acting Director, MNR, and Professor of Physics*
Butler, Michael Paul, B.Eng., M.Eng., P.Eng./*Chief Reactor Supervisor*
Ernst, Peter I.C., B.Eng., M.Sc./*Reactor Manager*
Harvey, John W., B.Sc., Ph.D./*Senior Health Physicist*
LoPresti, Christopher S., B.Eng./*Reactor Supervisor*
Pidruczny, Alice E., B.Sc./*Manager, Centre for Neutron Activation Analysis*

The McMaster Nuclear Reactor (MNR), which has been operating on the McMaster campus since 1959, is the only medium power research reactor in Canada. MNR is also the only reactor at a Canadian university with adequate power to enable scientists and engineers to explore the many types of research requiring neutron or gamma radiation: nuclear science, applications of nuclear methods, neutron scattering, neutron radiography, high flux activation analysis, isotope production, applications of radioisotopes, and many other areas.

MNR is an MTR open pool-type research reactor producing neutron fluxes up to 1×10^{14} neutrons/cm^2/second when operating at a power output of 5 megawatts (thermal). It utilizes plate-type enriched uranium fuel elements and is moderated and cooled with light water. The open pool concept provides easy access to the reactor core and its experimental facilities, making it a very flexible reasearch reactor. Special facilities are continually being developed to accommodate new research requirements.

The reactor building is strategically located relative to the Science, Engineering, and Health Science Faculties, and is available to all departments for both educational and research activities, and in the establishment of new fields of investigation. The reactor is also used in commercial, industrial and health applications and by researchers from other major universities and from industry and government laboratories.

McMASTER TANDEM ACCELERATOR LABORATORY

Dr. J.C. Waddington B.Sc.(Eng.), Ph.D./*Director*

The McMaster Accelerator Laboratory is a large facility used for research in experimental nuclear physics, materials research, molecular spectroscopy, accelerator mass spectrometry and nuclear medicine. There are two principal accelerators: an 11 million volt tandem Van de Graaff accelerator and a smaller single-ended 3 million Van de Graaff.

In the tandem accelerator, singly charged negative ions are accelerated to the positive terminal of the machine. There they are stripped in flight of two or more electrons and are then repelled from the same terminal. In this manner, energetic beams can be produced of most materials with atomic number less than 20. These beams are directed to one of many experimental target locations. The facilities consist of areas for radioisotope production for nuclear medicine, a hydrogen-profiling location, a large heavy-particle spectrograph, a rare-isotope detection apparatus, several general purpose chambers, a cryogenic target for molecular spectroscopy studies, a gamma-ray spectrometer and a molecular beam epitaxy unit.

Since the sophisticated measurements call for the extensive use of remote automatic data acquisition as well as off-line analysis, the laboratory has several computers (the largest being a VAX 11/750).

Although the facility is used primarily by research scientists and graduate students, several undergraduate students assist with some of the experiments.

PROGRAMME FOR QUANTITATIVE STUDIES IN ECONOMICS AND POPULATION

Mr. Frank T. Denton, B.A., M.A., F.R.S.C./*Director*

The Programme for Quantitative Studies in Economics and Population is an interdisciplinary programme based in the Faculty of Social Sciences. Its purpose is to encourage and facilitate faculty research in economics and other areas of the social sciences, with special emphasis on the analysis of population and the relationships between population change and changes in the economy and the society. The Programme's Research Associates number about forty faculty members from various departments of the University and interdisciplinary cooperation is encouraged. The Programme issues a series of reports known as *QSEP Research Reports* and authored by individual Research Associates; these reports, or abstracts of them, are distributed widely, both in North America and in other parts of the world. The Programme is also responsible for a continuing series of seminars with invited speakers from other universities or non-university research centres, as well as from within McMaster. The Programme has been in existence since 1981.

Student Services and Organizations

Dean of Student Affairs

R. Heinzl/*Dean*

The Dean of Student Affairs heads a variety of specialized student service offices. These offices include the Student Counselling Service, International Students' Advisor, Student Health Service, Student Financial Aid and Scholarships, Conference Services and Residence Services.

The Dean is happy to meet with individuals and representatives of student organizations with problems, concerns, questions or suggestions on any matter relating to student life and services on campus. The Dean's Office is located in Hamilton Hall, Room 312, telephone extension 4649.

RESIDENCES

Mr. Ron Coyne/*Director of Residences*
Susan Marks/*Admissions Co-ordinator*

The University owns and operates nine on-campus residences accommodating a total of 2386 students. The eight traditional-style residences consist of three women's residences (762), two men's residences (341) and three co-educational residences (780). These residences are for single undergraduate students and are provided with staple articles of furniture including desks, chairs, beds, mattresses, pillows and bedding. Students provide their own towels and are responsible for the cleanliness of their individual rooms although a linen change is made weekly.

Sixty per cent of the traditional spaces are reserved for freshmen students and admission is based on academic standing. All students in these eight residences are required to take the minimum food plan which provides for lunch and dinner (Monday to Friday) for the full academic year (Christmas holidays excluded). Optional 14 and 19 meal plans have now been added to the existing residence food plan. These plans include full weekend meal service.

In addition, an apartment-style residence (Bates Residence) accommodates five hundred (500) men and women students. The apartments are unfurnished (except for a stove, refrigerator, carpeting and drapes) and are set aside for upperclass students including a limited number of graduate and transfer students and special cases. The food plan is optional.

The University does not provide any on-campus facilities for married students at present. Students in this category may wish to use the services of the Off-Campus Housing Office, located in Room 118, Wentworth House.

The responsibility for the overall administration of the University Residence System lies with the Director of Residences. The Director determines policy and develops programmes. For each Residence, the Director appoints one Hallmaster from the University community to serve as a mentor and leadership figure within the Residence. The Director of Residences works with the residence students' government and Hallmasters to fashion a mature residence community in which self-discipline is maximized and the need for University-imposed sanctions is minimal. The Hallmasters work with the student government and students on collective projects and individual personal concerns. The office of the Director of Residences is located in the Commons Building, Room 101A, telephone ext. 4223.

The Residence Admissions Co-ordinator is responsible for admission systems, withdrawals and waiting lists. The Co-ordinator reports to the Director of Residences. Enquiries for residence information should be directed to the Admissions Co-ordinator, Residence Services Office in the Commons Building, Room 101, telephone ext. 4223.

Students applying to McMaster will receive a letter of instruction concerning application for residence. Letters of Acceptance from the Registrar's Office will be accompanied by forms concerning residence application. Offers of acceptance into residence will be confirmed upon receipt of a deposit, which will be applied to the student's residence fees. If a residence space is available and assigned, but such a space is not required, then students must cancel, in writing, the assigned space within the deadline dates. Failure to do so will result in forfeiture of part or all of the deposit.

Students interested in residing on campus any time between May 3 and August 28 should apply directly to the Conference Office, Commons Building, Room 115. Applications and advance reservations are available from March 1 each year.

OFF-CAMPUS HOUSING

The Off-Campus Housing office is a free listing service provided by the University. This office maintains updated lists of available accommodation in Hamilton and the surrounding area. Also, it provides area maps, transit maps, free telephones for local calling and personal assistance to help in the housing search. The Off-Campus Housing office is operated on a year-round basis and is located in Room 118, Wentworth House.

This office operates in conjunction with the Student Tenant Association and together they make an attempt to handle all possible problems and needs that a student renter may encounter.

The Off-Campus Housing office is a unique part of the Residence Services office and can be contacted at extension 4086.

STUDENT COUNSELLING SERVICE

Dr. W. Wilkinson/*Director*
D. Nifakis/*Counselling Psychologist/Counsellor*
D. Lawson/*Career Counsellor*
Dr. D. Palmer/*Academic Skills Counsellor*
V. Reid/*Career Counsellor*

The Student Counselling Service is a resource provided by the University to promote the personal, academic and career development of McMaster students.

The staff offers many counselling, assessment and information services and programmes designed to help students deal with personal problems, clarify and achieve education and career goals, and gain the most from their university experience.

Personal problems which students discuss with counsellors often concern family and peer relationships, or feelings such as anxiety, apathy or depression, which can interfere with their academic and personal effectiveness.

Many students seek help in defining their interests and abilities in order to make important decisions about academic programmes and career plans. Others ask for help in writing resumes and in preparing to look for employment. Some experience difficulties with their studies, or wish to maximize their efficiency in studying. Still others want to improve their interpersonal and communication skills.

In addition to individual counselling services, the staff regularly presents comprehensive group programmes in such areas as educational and career planning, communication and assertiveness skills, stress management and speaking in public. Seminars and workshops on such topics as preparing for university, effective study methods, and various aspects of career development and the employment search process are always well-attended.

The Counselling Service maintains a library of career and educational information for reference use by all members of the University community and the general public.

The department also acts as an administrative centre for such frequently required academic tests as the Graduate Record Examinations, the Law School Admission Test, the Medical College Admission Test, and the Miller Analogies Test.

All discussions between students and counsellors are voluntary, private and confidential. Whenever required, students are given assistance in locating other specialized helping sources both on and off campus.

Students who wish to talk with a counsellor are invited to visit the office in Hamilton Hall, Room 302, or telephone extension 4711.

INTERNATIONAL STUDENTS' ADVISOR

Patrick J. Fernando/*Advisor*

The office is available to all foreign students for consultation, advice and direction in numerous areas of concern, providing information regarding immigration matters, accommodation, orientation, etc. The office is located in Divinity College, Room 146, telephone ext. 4748.

STUDENT HEALTH SERVICE

Dr. M. Skinnarland/*Director*
Mrs. L.Currie/*Nurse Administrator*

Health services are available to all undergraduate and graduate students throughout the calendar year. The Student Health Service is open Monday through Thursday from 9 A.M. to 5 P.M. and from 10 A.M. to 5 P.M. on Friday.

The Student Health Service provides comprehensive primary medical care with attention to the physical, psychosocial and health educational needs of individual patients. Services include physician visits, appropriate medical referrals, diagnostic tests including pregnancy tests, allergy injections, immunization, wart treatment and counselling for birth control, personal, psychiatric and other health concerns.

The service is located in McKay Hall Residence on the ground floor, south end, telephone number 525-9140 ext. 4441, 4442.

CONFERENCE SERVICES

Mrs. J. Gowland/*Manager*

All non-academic events, meeting space, parties, receptions etc. for students, faculty and staff are handled by Conference Services.

During the summer months, accommodation, food services and meeting facilities are available on campus for conferences, conventions and touring groups in addition to residence for summer students and transient visitors.

The Front Desk, located in the Commons Building, is open 7:00 a.m. to 12:00 midnight daily, May 1 to August 31. Contact Conference Services, Commons Building, Room 115, telephone ext. 4781.

STUDENT FINANCIAL AID

Please refer to the description of services in this Calendar, in the sections *Financial Information* and *Supplementary Student Financial Aid.*

Services to Students

OFFICE OF THE OMBUDSMAN

The McMaster Students Union employs the Ombudsman. The Ombudsman provides information and advice relating to complaints, disputes and appeals between students and other members of the McMaster community including academic and admission inquiries, financial aid, academic and non-academic disciplinary matters, disputes involving the provision of services such as financial, retail, parking and security services, as well as human rights concerns. The office is in Hamilton Hall, Room 212, telephone extension 2003.

UNIVERSITY CHAPLAINS

Catholic and Protestant chaplains on campus provide a wide range of student services in worship, discussion groups, pastoral counselling, and social action. At least one of the chaplains is available during the day in the office, and students can always call the chaplain's residences for appointments at other times. The chaplains support many student activities as well as caring for personal and religious needs. Their office is in Wentworth House, Room 108; telephone extension 4207.

Chapel Services:

There is a chapel service at 10:30 a.m. in the University Chapel, on Mondays, Tuesdays, Wednesdays and Fridays during the Winter Session. These services are conducted by members of the student body, by members of the faculty or by the chaplains. There is also a weekly communion in the Chapel on Thursdays at 12:30 p.m. followed by a lunch at 1:00 p.m. The Chapel is open for private devotions each weekday from 8:15 a.m. to approximately 10 p.m. After 5 p.m. it may be necessary to enter the chapel through the Divinity College building.

STUDENT PLACEMENT SERVICE

The Student Placement Office (Canada Employment Centre) operates on a year-round basis to facilitate hiring of graduates, undergraduates, and recent alumni of all disciplines into permanent, temporary and part-time employment. Located in Hamilton Hall, Room 409, office hours are 8:30 a.m. to 4:30 p.m., Monday to Friday, telephone 525-9140, extension 4253.

Major national employers conduct on-campus interviews from October to March for career and summer employment. In co-ordinating this recruitment program, the Student Placement Office posts announcements on its own and departmental bulletin boards; provides the standarized University and College Placement Association application forms, and forwards them for pre-screening; maintains related job and employer reference material; schedules employment interviews. Students should register at the Placement Office in September to prepare for this program.

A direct referral service to more immediate part-time and career jobs also operates throughout the calendar year. Bulletin boards should be checked regularly.

In addition, Student Placement maintains a library of reference material on a large number of potential private and public sector employers.

Staff are available to meet students on an individual basis to offer job referral assistance and to disscuss career-related concerns such as resume development, preparing for interviews and conducting an effective job search.

FOOD SERVICES

The University operates a number of eating places on campus serving a variety of food items. Dining rooms for the use of students registered in meal plans are located in the Refectory and in the Commons Building. McMaster students, staff and faculty may purchase a variety of plans from the Food Services Department in the Commons Building. Coffee shops are strategically located on the campus, in A.N.Bourns Building, Togo Salmon Hall, Kenneth Taylor Hall, and the Rathskellar. Check with the Food Services Department for hours of operation. Food service is also available in a student-operated facility in Wentworth House, and in the cafeteria in McMaster University Medical Centre. Supplementing these facilities are vending machines at many locations about the campus.

PARKING

Campus parking facilities are limited and the availability of space cannot be assured. Travel to and from the University on foot, by public transportation and in car pools is encouraged.

Parking regulations are in effect at all times and University parking permits are required for all private motor vehicles. These permits are valid only when purchased at an entrance kiosk (daily permit), or from the Parking Officce in the E.T. Clarke Centre upon presentation of a current University Identification Card, vehicle registration and payment of the prevailing parking fee.

Special arrangements can be made for disabled parking privileges.

Drivers operating motor vehicles on campus are responsible for becoming familiar with the McMaster University Traffic & Parking Regulations. Violations are subject to fines and/or tow-away. Disregard of violation charges may result in suspension of parking privileges, tow-away at owner's expense, sanction of transcripts and/or prosecution under the general law, the Trespass to Property Act and the City of Hamilton Private Parking Bylaw No. 75-155.

BOOKSTORE

The University Bookstore, owned and operated by the University, is located in the lower level of Gilmour Hall. A Microcomputer Centre is located within the Bookstore. A Health Sciences Branch is located in the McMaster University Medical Centre. In addition to course books, the Bookstore maintains a wide range of supplementary reading materials, both academic and general. Stationery and computer supplies and other items are also stocked. Charge accounts may be opened after registration.

POST OFFICE

The McMaster University Sub Post Office is located in the basement of Gilmour Hall adjacent to the Bookstore. The Post Office offers full postal service, from 9 a.m. to 4 p.m., Monday to Friday. Post Office Boxes may be rented by faculty, staff, and students for the duration of their stay at McMaster.

McMaster University Alumni Association

Two of the principal purposes of the McMaster University Alumni Association are to serve its members and seek ways for its members to serve their University. Founded in 1895, just eight years after McMaster was incorporated, the association now includes more than 58,000 alumni.

The affairs of the Association are managed by the Alumni Council which is made up of elected officers, counsellors who serve as portfolio managers, and the alumni representatives to the McMaster Board of Governors and Senate. The Council meets quarterly with its Executive responsible for carrying out alumni business between Council meetings.

The direct involvement of alumni is commonly through the various alumni branches. Traditionally, the branches have been geographic, serving all alumni living in a particular area; however, academic branches whose members share a common discipline, such as nursing, social work and commerce, are becoming increasingly popular.

The link between the Alumni Association and the University is through the office of the Director of Alumni Advancement, located on the first floor of Chester New Hall. This office maintains mailing addresses for all graduates and former students. The office also provides the Association, its branches and committees with support services as well as assisting with Association functions.

Together, the Association and the Office of Alumni Advancement attempt to be responsive to the diverse interests of alumni. Events such as Grads' Day and Homecoming and services such as continuing education courses and group life insurance are but a few of the many ways the Association serves its alumni.

A very important aspect of the Association's mission is to benefit McMaster. Alumni assist with the recruiting of promising high school students, support University fundraising campaigns, elect able representatives to the McMaster Board of Governors and Senate, and promote McMaster in any way possible.

In summary, the McMaster Alumni Association provides the graduates of this fine University with a means of maintaining a life-long link with the University.

Athletics

Professor W.H. Fowler/*Director*

The School of Physical Education and Athletics offers a variety of programmes so that all students have the opportunity to keep fit, compete in active pursuits at their own level, and enjoy sports of their choosing.

For those who wish to relax and enjoy their leisure time, a wide recreational programme is offered, including everything from sauna baths and swimming to squash and weight training. Most of the traditional club activities are offered and instruction is provided to assist beginners with the skills involved.

For those with a more competitive outlook, a highly developed and very popular intramural programme is in full swing from early fall until late spring.

For those students who possess still higher skills, the intercollegiate programme provides an exciting challenge to both men and women. The fine performances of student athletes and the social involvement of student spectators are focal points of student life on campus.

Student Government and Activities

The McMaster Students Union's purpose is to represent the concerns and service the needs of over 9,800 full-time students. Every undergraduate student who is registered in 18 units or more, is a member of the McMaster Students Union (MSU), and as such is entitled to all its benefits and services.

The MSU is governed by the Student Representative Assembly (SRA), a council of up to 35 of its full-time members. All but two are elected in March by their fellow students in various faculties; each has a proportionate number of seats relating directly to the size of the faculty. The President and Treasurer are the remaining two members of the SRA. The President is elected in February by the entire student body and the Treasurer is elected by the SRA from the general student body. Students who have questions about student government, or wish to bring a matter before the SRA, should contact their representative, the President, or the Vice-President.

The duties of the SRA are: to set policy for the MSU; to approve annual budgets; and to make decisions on capital purchases.

Under the direction of the SRA, committees have been established in the areas of academics, teaching awards, student services, finances, external affairs, special events and alcohol awareness. The committees are composed of assembly members and interested MSU members-at-large. Undergraduate student involvement is encouraged at the committee level. Vacancies are announced in the student newspaper, *The Silhouette*.

The McMaster Students Union Inc. operates a variety of services for students including a grocery store, Day Care Centre, Games Room, two full-time pubs, Emergency First Response Team, Student Tenant Association and Sexual Education Centre. The MSU staffs an Ombudsman Office to help students with problems either internal or external to the University. The Programming Department organizes Orientation, Homecoming, Winter Carnival and major concerts. *The Silhouette* and the campus radio station CFMU, 93.3, are both owned and operated by the McMaster Students Union Inc. The MSU funds over 80 clubs and societies which encompass a kaleidoscope of areas/topics including academic, political, religious, cultural and general interest.

Information about the MSU and its services can be found in the student handbook (the *Mac Almanac*), the MSU Info Office (room 226, Hamilton Hall) and at the MSU General Offices (room 217, Hamilton Hall, 525-9140, ext. 2003).

Full-time undergraduates are urged to visit Hamilton Hall and to participate in the many student organizations and services.

(Through their membership in the MSU, full-time undergraduate students are also affiliated with the Canadian Federation of Students, and the Ontario Federation of Students (CFS/OFS). For information about both of these organizations, contact the MSU)

McMaster Association of Part-time Students (MAPS)

MAPS exists to look after the special interests of part-time degree or certificate students, who have a different educational experience than full-time students. University fees for these students include an assessment to support the Association.

The Association's lounge and office are open all year from 10:00 a.m. to 9:00 p.m. Monday to Thursday, 10:00 am to 2:00 pm Friday, when classes are in session. MAPS Executive Director, Ms. Judy Worsley, is available to help students. If you have a question pertaining to university procedure or a problem of any kind, Judy or the MAPS staff, can either supply the answer or put you in touch with someone who can.

The part-time student newsletter, *LINK*, is published on a regular basis, and will be sent to your professor or class representative for distribution to you. If you do not receive a copy, call or drop by the office.

MAPS provides the opportunities and methods for part-time students to communicate their needs and ideas to university officials, by ensuring representation on university governing bodies and committees, and by the Association's direct contact with university administrators on matters such as course availability, evening services and tuition fees.

COPUS, the Canadian Organization of Part-time University Students, works at the provincial and national levels to improve programme availability, financial aid, transferability of credits and equality under the tax laws for part-time students. MAPS is a member of this group of universities.

If you are a part-time student, MAPS is for you. It is a way to bridge the gap between you and the University, by helping you feel a part of McMaster's student body. We urge you to participate as often as possible in the academic and social events which will be available to you at McMaster.

The MAPS lounge and office are located in Kenneth Taylor Hall, Room 102, telephone 525-9140, ext 2021.

Undergraduate Academic Awards

The University Senate, acting on behalf of generous benefactors and donors to the University, bestows academic awards on entering, in-course and graduating students in order to encourage and recognize high levels of scholarship. In recognizing such scholastic achievement, the University requires all recipients of academic awards to fulfill a set of general conditions, in addition to meeting the particular conditions attached to individual academic awards. These general conditions are outlined below and at the beginning of each section which describes the various types of award. The general conditions have been established in order to ensure both equity in competition and an adequate overall academic standing. Any interpretation of the conditions attaching to academic awards is solely the prerogative of the Undergraduate Council.

TERMINOLOGY

(A complete explanation of the terminology used to describe Academic Awards is provided in the sections of the Calendar described below.)

The *Winter Session* is the period from September to April as defined in the *Sessional Dates* on pages 4 and 5.

Baccalaureate degrees are those listed under *Degrees and Programmes*, the abbreviations of which start with the letter 'B'.

Continuing, Occasional, and Post-degree Students are defined under *Admission Requirements* and are students not registered in degree programmes.

University Average (UA), Cumulative Area Average (CAA), Graduation Average (GA), Level, and Reviewing Period are defined under *Academic Regulations.*

The *Sessional Average* is the weighted average of the grades in all courses (excluding any designated 'Extra') taken during the Winter Session immediately prior to the May review.

A *full load* is the number of units specified in the Calendar for an individual level of a programme (e.g., Honours Biology and Psychology, Level II: 33 units) or, if the Calendar does not specify the programme work by individual levels, the average number of units per level.

1. General Conditions Relating to All Academic Award Recipients

1.1 The University Academic Awards listed below are provided exclusively for students entering, registered in, or graduating from their first baccalaureate degree programme at McMaster University. Students registered in a second undergraduate degree programme, Continuing Students, Occasional Students, and Post-degree Students are not eligible for these awards.

1.2 A student may be named the winner of an unlimited number of University Academic Awards but may retain the monetary benefits of:

a. travel scholarships and awards such as books and medals; *and*

b. awards continued from a previous year (including entrance scholarships), except as provided by the particular terms of an award; *and*

c. *either* one award greater than or equal to the value of a Senate Scholarship and one award of less than the value of a Senate Scholarship, *or* two awards of less than the value of a Senate Scholarship.

When a student is named the winner of an award but may not retain the monetary benefits because of the conditions listed above, the next student eligible to receive both the award and its monetary benefits will be named the winner of the award.

1.3 All awards for which a student is named the winner and receives the monetary benefits will be shown on the student's official record; all awards for which a student is named the winner but does not retain the monetary benefits will be shown on the student's official record *honoris causa.*

1.4 The monetary benefits of travel scholarships, awards won by part-time students and graduating students, and awards such as books and medals will be disbursed directly to the student.

1.5 The monetary benefits of other awards will be disbursed only if the recipient is then registered as a full-time student in a baccalaureate degree programme at McMaster University in the next Winter Session after the award was earned and then will be allocated in the following manner:

a. first the monetary benefits will be credited to the student's academic fees account up to the value of the academic fees prescribed for a full-load of work specified in the Calendar for the level and programme in which the student is registered;

b. then amounts in excess of the above will be disbursed directly to the student in November.

1.6 Awards credited to the student's fees account are not refundable in cash under any circumstances.

1.7 Awards credited to the student's academic fees account may be used only to defray academic fees for baccalaureate degree courses taken during the Winter Session in which the account is credited with the awards. Students wishing to defer the benefits of an award to a later session should apply to the Academic Awards Officer. Approval of applications is not automatic, and deferments are not normally granted for more than one calendar year.

1.8 Students holding four-year full-fees scholarships who choose to accelerate their programme and to complete their degree earlier than normal by completing Summer Session courses and who wish to employ the benefits of their award to defray the academic fees for such courses should apply to the Academic Awards Officer. Approval of applications is not automatic.

1.9 The University reserves the right not to grant an award in the absence of a suitable candidate, and to limit the number of awards when there are too few suitable candidates. The University also reserves the right to withdraw, or amend the terms of, any award.

1.10 The particular terms for University Academic Awards are listed below in the following sections:

SECTION 2. AWARDS FOR ENTERING STUDENTS
- The McMaster Scholars Programme
- Other Scholarships Open to Canadian Students
- Scholarships Open to Ontario Students
- Merit Awards Open to Ontario Students

SECTION 3. AWARDS FOR FULL-TIME IN-COURSE STUDENTS
- Medal
- General Scholarships and Prizes
- Senate Scholarships
- Residence Scholarships
- Travel Scholarships

SECTION 4. SINGLE ACHIEVEMENT AWARDS FOR FULL-TIME AND PART-TIME STUDENTS

SECTION 5. AWARDS FOR PART-TIME IN-COURSE STUDENTS

SECTION 6. AWARDS FOR GRADUATING STUDENTS
- Medals
- Ring
- Scholarships and Prizes

INDEX OF ACADEMIC AWARDS

In order to find a specific award, use the *Index for Academic Awards.*

2. Academic Awards for Entering Students

2.1 These awards are provided exclusively for students qualifying for admission to Level I of a baccalaureate degree programme.

2.2 In order to be considered for an entrance scholarship, students must obtain at least a first-class average in the secondary school credits required for University admission. All students who meet this requirement and who apply for early admission to the University within not more than two years of completion of their secondary school studies will automatically be considered as applicants for entrance scholarships, unless a separate application is explicitly required by the particular terms of the award.

2.3 In addition to meeting the *General Conditions* listed in Section 1, entrance scholarship recipients will begin their studies in the next Winter Session. Students wishing to defer the benefits of an award to a later session should apply to the Academic Awards Officer. Approval of applications is not automatic, and deferments are not normally granted for more than one calendar year.

2.4 Unless otherwise specified, recipients may retain an entrance scholarship which provides for awards beyond Level I while registered in a baccalaureate degree programme and until graduation or for four years (five years if registered in a five-level programme), whichever is less. In order to retain such scholarships, students must complete during each successive Winter Session at the University a full load corresponding at least to:

a. *either* the minimum number of units specified in the Calendar for their level and programme;

b. *or*, if the Calendar does not specify the programme work by individual levels, the average number of units per level;

and must maintain a University Average of at least 9.5 and obtain no F grades.

THE McMASTER SCHOLARS PROGRAMME

Each year up to five students who are Canadians or landed immigrants and entering from a secondary school may be awarded the title *McMaster Scholar*. At any time there may be no more than 16 McMaster Scholars registered in undergraduate programmes. Applications are required and must be submitted not later than March 31. Applicants will be asked to provide a resume, an essay and letters of recommendation. Details may be obtained from the Academic Awards Officer.

Value: $10,000 each ($2,500 a year for up to four years).

The McMaster Scholars programme incorporates the following awards:

THE GEORGE AND NORA ELWIN SCHOLARSHIPS

Established in 1979 by bequest of George and Nora Elwin of Hamilton.

THE LILLIAN AND LEROY PAGE SCHOLARSHIP

Established in 1982 by donation of the Lillian and Leroy Page Foundation for a student from the Hamilton area entering the Faculty of Science.

OTHER SCHOLARSHIPS OPEN TO CANADIAN STUDENTS

Open to Canadian students from any province or territory of Canada.

THE ALUMNI ASSOCIATION SCHOLARSHIPS

Established in 1961 by the McMaster University Alumni Association as a memorial to former members of the McMaster faculty in recognition of their contribution to higher learning. Two scholarships to be awarded on the basis of general proficiency in the subjects required for admission to students from any province or territory of Canada.

Value: Up to four years' academic fees each.

THE JOSEPHINE MAGEE SCHOLARSHIP

Established in 1959 by bequest of Josephine Magee of Hamilton. To be awarded on the basis of general proficiency in the subjects required for admission to students from any province or territory of Canada.

Value: Up to four years' academic fees.

SCHOLARSHIPS OPEN TO ONTARIO STUDENTS

The following scholarships are open to any student applying for admission from an Ontario secondary school within two years of completing the required Grade 13/OAC subjects. The recipients of these scholarships will be determined primarily on the basis of grades submitted for early admission in the Grade 13/OAC work.

THE ASSOCIATION OF PROFESSIONAL ENGINEERS SCHOLARSHIP

Established in 1961 by the Ontario Professional Engineers Foundation for Education. To be awarded to a student entering the Faculty of Engineering.

Value: $1000.

THE CHANCELLORS' SCHOLARSHIPS

A variable number to be awarded to students entering a full-time programme of study.

Value: One year's academic fees each.

THE HELEN M. CURREY SCHOLARSHIP

Established in 1941 by bequest of Helen Maud Currey of Drumbo, Ontario. To be awarded every four years, the twelfth award to be made in 1988.

Value: Up to four years' academic fees.

THE DOFASCO SCHOLARSHIP

Established in 1955 by the Dominion Foundries and Steel Company. To be awarded to a student who is a Canadian citizen and is entering Engineering I.

Value: $8,000 ($2,000 a year for up to four years).

THE DUNDAS SCHOLARSHIPS

Established in 1984 from funds donated anonymously. A variable number of scholarships to be awarded to students from Dundas and surrounding area entering a full-time programme of study.

Value: One year's academic fees each.

THE H.P. FRID SCHOLARSHIP

Established in 1982 by the family of H.P. Frid in his memory. To be awarded to a promising student entering a full-time programme of study.

Value: One year's academic fees.

THE MERRILL FRANCIS GAGE ENTRANCE SCHOLARSHIP

Established in 1982 from the estate of Merrill Francis Gage of Hamilton. To be awarded to a keyboard student entering Music I who, in the judgment of the Department of Music, has attained outstanding musical proficiency.

Value: $1,000.

THE GOVERNORS' SCHOLARSHIPS

A variable number to be awarded to students entering a full-time programme of study.

Value: Up to four years' academic fees.

THE HAMILTON SPECTATOR SCHOLARSHIP

Established in 1955 by the Hamilton Spectator. To be awarded to a student from Hamilton and district.

Value: $8,000 ($2,000 a year for up to four years).

THE JOHN HODGINS MEMORIAL SCHOLARSHIP

Established in 1985 by his wife, Jean, in memory of Dr. John W. Hodgins in recognition of his extraordinary contributions in founding the Faculty of Engineering which he served with distinction as the first Dean. To be awarded to an outstanding student entering the Faculty of Engineering.

Value: One year's academic fees.

THE NELLIE P. HOGG SCHOLARSHIPS

Established in 1965 by bequest of Nellie P. Hogg of Hamilton. Two scholarships to be awarded to women students entering a full-time programme of study.

Value: Up to four years' academic fees each.

THE DR. HARRY LYMAN HOOKER ENTRANCE SCHOLARSHIPS

Established in 1981, and resulting from the bequest of Dr. H.L. Hooker. Sixteen scholarships to be awarded to students with the highest standing in Grade 13/OAC subjects entering a full-time programme of study.

Value: $8,000 each ($2,000 a year for up to four years).

THE AMELIA MORDEN, PAARDEBURG CHAPTER, I.O.D.E., SCHOLARSHIP

Established in 1968 by the Paardeburg Chapter, I.O.D.E. To be awarded to a student from a secondary school in Hamilton who attains an average of at least 70.0% in Grade 13/OAC subjects and who has a satisfactory record with respect to character, personality and activities. Preference to be given to children of service or ex-service personnel.

Value: $150.

THE JURY SCHOLARSHIP

Established in 1941 by bequest of J.H. Jury of Bowmanville, Ontario. To be awarded to a student from a Bowmanville high school. Preference will be given to students entering the Faculty of Humanities or of Social Sciences.

Value: Up to four years' academic fees.

THE LLOYD MEMORIAL SCHOLARSHIP

Established in 1956 in memory of Henry Hoyes and Lizzie Lloyd by their children. Grade 13/OAC subjects to be included are: Physics, Chemistry, two credits of Mathematics, and either Biology or a third credit of Mathematics.

Value: Up to four years' academic fees.

THE ALBERT MATTHEWS SCHOLARSHIP

Established in 1920. Grade 13/OAC subjects to be included are Latin and a language other than English.

Value: Up to four years' academic fees.

THE HAROLD MATTHEWS MEMORIAL SCHOLARSHIP

Established in 1917. Grade 13/OAC subjects to be included are French and either German or Spanish.

Value: Up to four years' academic fees.

THE ISABELLA CAMPBELL McNEE SCHOLARSHIP

Established in 1915 and augmented in 1926. Grade 13/OAC subjects to be included are three credits of Mathematics and Physics.

Value: Up to four years' academic fees.

THE MOULTON COLLEGE ENTRANCE SCHOLARSHIP

Established in 1980 from funds originally subscribed by the Alumnae of Moulton College during the years 1946 to 1949. To be awarded to a woman student entering a full-time programme of study.

Value: Up to four years' academic fees.

THE ALVIN I. OGILVIE SCHOLARSHIPS
Established in 1984 by bequest of Alvin I. Ogilvie of Hamilton. Five scholarships to be awarded to students entering a full-time programme of study.
Value: One year's academic fees each.

JOHN CHARLES STRADWICK SCHOLARSHIP
Established in 1988 by the Simcoe Erie Group to honour its founder, John Charles Stradwick. To be awarded to an outstanding student from the greater Hamilton area or southwestern Ontario who is entering Business I.
Value: Up to four years' academic fees.

THE D.E. THOMSON SCHOLARSHIP
Established in 1909 and augmented in 1915. Grade 13/OAC subjects to be included are English and either Latin or French.
Value: Up to four years' academic fees.

THE FRANK THOROLFSON MEMORIAL SCHOLARSHIPS
Established in 1978 in memory of Professor Frank Thorolfson, first Chairman of the Department of Music. One or two scholarships to be awarded to students entering Music I who, in the judgment of the Department, have attained high scholastic achievement and musical proficiency.
Value: $750 each.

THE WHEELER SCHOLARSHIP
Established in 1915. Grade 13/OAC subjects to be included are: History, English and a language other than English.
Value: Up to four years' academic fees.

MERIT AWARDS OPEN TO ONTARIO STUDENTS

Merit Awards are granted on the basis of academic standing and contribution to school and community life in extracurricular activities and work. Applicants must be in Grade 13 in the current school year.

THE McMASTER MERIT AWARDS
Made available from time to time by authorization of the Board of Governors of the University.
Value: Forty awards of $800 each.

THE CATHRYN E. KAAKE MERIT AWARD
Established in 1988 in memory of Cathryn E. Kaake ('78) by family and friends.
Value: $800.

THE LESLIE A. PRINCE MERIT AWARDS
Established in 1979 in honour of Leslie A. Prince, Dean of Students, by his friends and colleagues upon the occasion of his retirement and in recognition of his outstanding contribution to the University community. Two to be awarded.
Value: $800 each.

3. Academic Awards for Full-time In-Course Students

The following awards are based on competition across the University or within a faculty or programme.

3.1 These awards, which are granted in June or November, are provided exclusively for full-time students qualifying on the basis of work included at the May review (or deferred examinations resulting therefrom) in other than their graduating session.

3.2 In addition to meeting the *General Conditions* listed in Section 1, a student must complete during the Winter Session immediately prior to the May review a full load of work corresponding at least to:

a. *either* the minimum number of units specified in the Calendar for their level and programme;

b. *or*, if the Calendar does not specify the programme work by individual levels, the average number of units per level;

and must obtain a University Average of 8.0 and no F grades.

3.3 For students who complete a full load of work in the Winter Session as described above a Sessional Average will be computed, which is the weighted average of the grades in all courses (excluding any designated *Extra*) taken during that Session. The Sessional Average will be used to determine academic standing for the awards listed below, unless otherwise stated in the terms of a particular award.

3.4 The Sessional Average will be used to break any tie in the competition for awards which are based on another academic criterion.

MEDAL

THE CHANCELLOR'S GOLD MEDAL
Established in 1938. To be awarded to the student who has completed Level I and 60-80 units of any four or five-level programme and who ranks highest in scholarship, leadership and influence.

GENERAL SCHOLARSHIPS AND PRIZES

THE AARON PRIZE
Established in 1964 by Fannie Aaron ('44). To be awarded to the student who has completed Level I and 30-45 units of the three-level English programme and who attains the highest Cumulative Area Average.
Value: $25.

THE ASM INTERNATIONAL (ONTARIO CHAPTER) SCHOLARSHIP
Established in 1971 by the local Chapter of the American Society for Metals. To be awarded to the student who has completed Level I and 30-85 units of the Ceramic Engineering, Honours Materials Science, Materials Engineering or Metallurgical Engineering programme and who attains the highest Sessional Average (at least 9.5).
Value: $1,400.

THE ASSOCIATION OF PROFESSIONAL ENGINEERS UNDERGRADUATE SCHOLARSHIPS
Established in 1961 by the Ontario Professional Engineers Foundation for Education. Two scholarships to be awarded to students with the highest Sessional Average in Engineering programmes after the completion of each of: (a) Engineering I; (b) Level I and 35-55 units; or (c) Level I and 70-90 units.
Value: $500 each.

THE A.H. ATKINSON PRIZE
Established in 1980 by Atkinson Engineering Consultants Limited. To be awarded to the student in a Civil Engineering programme who achieves the highest average in Civil Engineering 3G04 and 3J04, taken in one Session.
Value: $200.

THE J. DOUGLAS BANKIER MEMORIAL SCHOLARSHIP
Established in 1977 in memory of Professor J. Douglas Bankier by his friends, colleagues, and former students. To be awarded to the student who has completed Level I and at least 60 units of an Honours or Major programme in the Department of Mathematics and Statistics, who attains the highest Sessional Average and who in that Session achieves a grade of at least B in Statistics 3D06.
Value: $400.

THE SCOTT BARTLETT MEMORIAL PRIZE
Established in 1985 in memory of Scott N. Bartlett by his family and friends. To be awarded to a student who has completed Level I and 60-75 units of the Honours Commerce Programme and who, in the judgment of the Faculty of Business, has achieved high standing in Commerce 3FA3 and 3FB3, taken in one Session.
Value: $100.

THE M. BANKER BATES SCHOLARSHIP
Established in 1975 by Dr. M. Banker Bates and augmented in 1978 in his memory by his family, friends and colleagues. To be awarded to the student who has completed Level I and 60-75 units of a programme in Commerce and who attains the highest Sessional Average.
Value: $350.

THE BEAUTY COUNSELORS OF CANADA SCHOLARSHIP
Established in 1956 by Beauty Counselors of Canada Limited. To be awarded to the student who has completed Natural Sciences I with the highest Sessional Average and who is entering Level II of Honours Biochemistry, Honours Chemistry, Honours Biochemistry and Chemistry or Honours Applied Chemistry programme.
Value: $300.

THE LOUISE E. BETTGER SCHOLARSHIPS IN MUSIC
Established in 1982 in memory of Louise E. Bettger of New Hamburg, Ontario, by her nieces and nephews. Three scholarships to be awarded to students in an Honours programme in Music who, in the judgment of the Department of Music, are outstanding: (a) one in the area of choral or vocal music to a student who has completed Music I or an additional 30-75 units; (b) one to a keyboard student who has completed Level I and 30-75 units; and (c) one to a student who has completed Music I and who has demonstrated overall musical excellence.
Value: $400 each.

THE J.P. BICKELL SCHOLARSHIPS
Established in 1955 by the J.P. Bickell Foundation to encourage interest in the study of geology and metallurgy. Two scholarships to be awarded, normally one to the student entering Level II of Honours Geology, Honours Geology and Physics, Honours Chemistry and Geology or Honours Materials Science, and the other to the student entering Level II of Chemical Engineering, Materials Engineering or Metallurgical Engineering, who attain the highest average in at least 12 units in any two of chemistry, geology, physics in Level I and a Sessional Average of at least 9.5. A scholarship is tenable for three years provided the recipient maintains a Cumulative Area Average or Cumulative Engineering Average of at least 10.0.
Value: $3,000 each ($1,000 each year).

THE BRIAN BLAKEY MEMORIAL SCHOLARSHIP
Established in 1979 in memory of Dr. Brian Blakey, Professor of French, by his friends, colleagues and former students, on behalf of his wife, Dorothy. To be awarded to the student who attains the highest Sessional Average on completion of Level I and 60-75 units of an Honours programme in Classics, Drama, English, French, German, Hispanic Studies, Italian, or Russian. Students in all programmes except Drama must have taken at some point Linguistics 1A06 or Anthropology 1B06 and achieved in it a grade of at least B−
Value: $600.

THE BRAMPTON BRICK LIMITED CERAMIC SCHOLARSHIP

Established in 1980. To be awarded to the student who has completed Level I and 35-90 units of the Ceramic Engineering programme with the highest Sessional Average (at least 9.5).
Value: $1,000.

THE BRIEN SCHOLARSHIP IN PHILOSOPHY

Established in 1944 by Dr. J. W. Brien of Windsor. To be awarded to the student who has completed Level I and 30-45 units of an Honours programme in Philosophy and who attains the highest Cumulative Area Average.
Value: $450.

THE JOSEPHINE STAPLES BRIEN SCHOLARSHIP

Established in 1936 by Dr. J.W. Brien of Windsor. To be awarded to a woman student who is entering her graduating Session and who qualifies on the basis of academic standing and interest in undergraduate activities.
Value: $300.

THE DR. AND MRS. F.R. BRITTON SCHOLARSHIP IN MATHEMATICS

Established in 1962 by Dr. and Mrs. F. R. Britton and augmented by Mrs. Britton's bequest in 1982. To be awarded to the student who has completed Level I and 30-45 units of an Honours programme in Mathematical Sciences who attains the highest Cumulative Area Average and is not the holder of an award of greater monetary value than this scholarship. Tenable in Levels III and IV provided that the recipient maintains satisfactory standing in an Honours programme in which mathematics, pure or applied, is the major subject of study.
Value: $1,500 ($750 each year).

THE CRISPIN CALVO PRIZE

Established in 1978 in memory of Professor C. Calvo by his family and friends. To be awarded to a student who has completed Level I and at least 60 units of an Honours programme in Chemistry and who, in the judgment of the Department of Chemistry, shows particular promise in thermodynamics.
Value: $200.

THE ELLA HALSTEAD CAMPBELL PRIZE

Established in 1978 by Mrs. Verna Caskey and Miss June Caskey in memory of Ella Halstead Campbell and augmented by Mrs. Edna M. Miller in 1987. To be awarded to a keyboard student registered in Music 1E04, 2E04, 3E04 or 4E04 who is outstanding in the judgment of the Department of Music.
Value: $200.

THE CANADA BRICK SCHOLARSHIPS

Established in 1988. Two scholarships to be awarded to students in the Ceramic Engineering and Management programme who, in the judgement of the Department of Materials Science and Engineering, have achieved high academic standing and have demonstrated interest in heavy clay technology: (a) one to a student entering Level III and (b) one to a student entering Level IV.
Value: $500 each.

THE CANADIAN CERAMIC SOCIETY (WESTERN SECTION) PRIZE

Established in 1987. To be awarded to a student entering Level IV of the Ceramic Engineering programme who, in the judgment of the Department of Materials Science and Engineering, exhibits most promise in the area of structural clay products.
Value: $200.

THE CANADIAN SOCIETY FOR CHEMICAL ENGINEERING PRIZE

Established in 1947 by the Chemical Institute of Canada. To be awarded to the student who has completed Level I and 70-85 units of a programme in Chemical Engineering and who attains the highest Cumulative Engineering Average.
Value: $50, medal and certificate.

THE CANADIAN SOCIETY FOR CHEMISTRY PRIZES

Established in 1947 by the Chemical Institute of Canada. Two awards to be made to students who have completed Level I and 60-80 units: (a) one to a student in an Honours programme in Chemistry, Honours Applied Chemistry, or Chemistry Major who attains high standing in chemistry; (b) one to a student in the Honours Biochemistry or Honours Biochemistry and Chemistry programmes who attains high standing in biochemistry and organic chemistry.
Value: Medal and certificate.

THE CANADIAN SOCIETY OF CIVIL ENGINEERS (HAMILTON SECTION) PRIZE

Established in 1987. To be awarded to a student entering the final level of a programme in Civil Engineering who, in the judgment of the Department of Civil Engineering and Engineering Mechanics, has demonstrated participation in extracurricular activities and has attained high academic standing.
Value: Plaque.

THE NORMAN N. CASKEY MEMORIAL PRIZE

Established in 1983 by Mrs. Verna Caskey and Miss June Caskey in memory of husband and father. To be awarded to a student who has completed Music I or Level I and 30-75 units of an Honours programme in Music and who, in the judgment of the Department of Music, has demonstrated musical excellence.
Value: $100.

THE CERTIFIED GENERAL ACCOUNTANTS ASSOCIATION PRIZE

Established in 1983 by the Hamilton Chapter of the Certified General Accountants Association of Ontario. To be awarded to a student who has completed Level I and 30-45 units of a programme in Commerce and who, in the judgment of the Faculty of Business, has attained an outstanding Sessional Average and a high standing (a grade of at least A−) in Commerce 2AA3.
Value: $150.

THE CHEMICAL INSTITUTE OF CANADA (HAMILTON SECTION) PRIZES

Established in 1984 by the Hamilton Section. Two prizes to be awarded to students who have completed Level I and 30-50 units: (a) one to a student in an Honours programme in Chemistry who, in the judgment of the Department, shows particular promise in Chemistry; and (b) one to a student in a programme in Chemical Engineering who, in the judgment of the Department, shows particular promise in Chemical Engineering.
Value: $50 each.

THE CIVITAN-BELL SCHOLARSHIP

Established in 1986 by the Civitan Club of Burlington. To be awarded to a student who has completed Level I and 36-90 units of a Social Work programme with high standing and who, in the judgment of the School of Social Work, has demonstrated an interest in a career in working with the mentally handicapped.
Value: $500.

THE CLARKSON GORDON SCHOLARSHIP

Established in 1952 by Clarkson Gordon. To be awarded to the student who has completed Level I and 30-45 units of a programme in Commerce and who attains the highest Sessional Average and in that Session attains a grade of at least A− in Commerce 2AA3.
Value: $350.

THE CLASS OF '37 SCHOLARSHIP

Established in 1987 by the Graduating Class of 1937. To be awarded alternately to the student who has completed Level I and 30-45 units of an Honours programme in Humanities and of an Honours programme in Science, and who has attained an outstanding Sessional Average.
Value: $750.

THE CLASS OF '50 SCHOLARSHIP IN HONOURS ECONOMICS

Established in 1982 by the Graduating Class of 1950 in Honours Economics. To be awarded to the student who has completed Level I and 30-45 units of an Honours programme in Economics, and who, in the judgment of the Department of Economics, has attained a high Sessional Average and has demonstrated leadership in undergraduate extracurricular activities.
Value: $450 and book.

THE CLASSICAL STUDIES PRIZE

Established in 1978 by Professor D.M. Shepherd. To be awarded to the student who has completed Level I and 30-45 units of an Honours programme in Classical Studies and who, in the judgment of the Department of Classics, shows most promise.
Value: $100.

THE CONSUMERS GLASS SCHOLARSHIP

Established in 1988. To be awarded to a student entering Level V of the Ceramic Engineering and Management programme who, in the judgment of the Department of Materials Science and Engineering, has attained notable academic standing.
Value: $1,000.

THE COOPERS AND LYBRAND SCHOLARSHIP

Established in 1986. To be awarded to a student who has completed Level I and 60-75 units of a programme in Commerce, with an average of at least 10.0 in the Level III accounting courses in that Session, and who, in the judgment of the Faculty of Business, has demonstrated high academic achievement and leadership.
Value: $850.

THE DANTE ALIGHIERI CENTRE OF HAMILTON SCHOLARSHIP

Established in 1987 by the Directors of the Dante Alighieri Centre of Hamilton on behalf of the Italian community. To be awarded to a student who has completed Level I and 30-45 units of an Honours programme in Italian and who, in the judgment of the Department of Modern Languages, attains notable academic achievement and an average of at least 10.0 in at least 12 units of required courses in Italian, taken in one Session.
Value: $500.

THE DATA GENERAL (CANADA) INC. SCHOLARSHIP

Established in 1987. To be awarded to a student who has completed Level I and 30-45 units of an Honours programme in Computer Science and who, in the judgment of the Department of Computer Science and Systems, has achieved notable standing (Sessional Average of at least 9.5) and demonstrated leadership ability and involvement in extracurricular activities.
Value: $1,000.

THE D. M. DAVIES PRIZE

Established in 1984 by friends, colleagues and former students in recognition of Professor Douglas Davies for his outstanding contribution to the Department of Biology during 34 years of service. To be awarded to a student who has completed Level I and at least 60 units of an Honours programme in Biology and who attains the highest average in at least 12 units of senior level courses in whole-animal biology, taken in one Session.
Value: $250.

THE DIGITAL EQUIPMENT OF CANADA LIMITED AWARD OF MERIT

Established in 1984. To be awarded to a student who has completed Level I and 35-50 units of a programme in Computer Engineering with a high Cumulative Engineering Average.
Value: $250 and certificate.

THE DOW CHEMICAL CANADA INC. SCHOLARSHIP

Established in 1976. To be awarded to the student who has completed Level I and 70-85 units of the Chemical Engineering programme who attains notable academic standing, and who has demonstrated leadership in extracurricular activities. The recipient may not be a holder of another scholarship.
Value: $900.

THE HORACE A. DULMAGE PRIZE IN PHILOSOPHY

Established in 1976 in honour of Professor Horace A. Dulmage by his colleagues and friends upon the occasion of his retirement from McMaster University. To be awarded to the student who has completed Level I and 60-75 units of an Honours programme in Philosophy and who, in the judgment of the Department of Philosophy, has attained the most notable standing.
Value: $200.

THE L.F. EULL PRIZE

Established in 1980 by Group Eight Engineering Limited. To be awarded to the student in a programme in Electrical Engineering who attains the highest average in Electrical Engineering 3NA3 and 3SA3, taken in one Session.
Value: $200.

THE BARBARA FRANCIS SCHOLARSHIP

Established in 1985 by Laura Dodson ('56) in memory of her sister. To be awarded to the student who has completed Level I and at least 30 units of an Arts and Science Programme and who has demonstrated outstanding achievement in both arts and science.
Value: $350.

THE HAROLD AND GERTRUDE FREEMAN SCHOLARSHIP IN FRENCH

Established in 1981 by members of the Class of '43 as a grateful tribute to Professor Harold A. Freeman, long-time teacher of French at the University and honorary president of the Class in its junior year, and his wife, Gertrude. To be awarded to the student returned from completing Level III abroad as part of the Third Year Elsewhere Programme and entering the final Session of an Honours programme in French who, in the judgment of the Department of French, has attained the highest level of accomplishment in knowledge of French language, literature and culture. The recipient must obtain a University Average of at least 8.0 and no F grades in the review at the end of the Winter Session immediately prior to entering the Third Year Elsewhere Programme.
Value: $800.

THE KLAUS FRITZE MEMORIAL PRIZE

Established in 1980 by friends of Professor K. Fritze. To be awarded to the student who has completed Level I and 30-45 units of the three-level Chemistry programme with the highest Cumulative Area Average.
Value: $150.

THE MERRILL FRANCIS GAGE SCHOLARSHIP

Established in 1982 from the estate of Merrill Francis Gage of Hamilton. To be awarded to a student who has completed Level I and 30-75 units of an Honours programme in Music and who, in the judgment of the Department of Music, has demonstrated excellence in performance on a keyboard or orchestral instrument.
Value: $500.

THE GENERAL REFRACTORIES OF CANADA CERAMIC SCHOLARSHIP

Established in 1980. To be awarded to the student entering Level II of Ceramic Engineering with the highest Sessional Average attained at the completion of Engineering I.
Value: $500.

THE GEOLOGY BOOK PRIZE

Established in 1955 by an anonymous graduate of Year '47 in memory of Dean C.E. Burke. To be awarded to a student who has completed Level I and 30-45 units of an Honours programme in Geology and who, in the judgment of the Department of Geology, attains high standing in geology.
Value: $50, for books.

THE J.L.W. GILL PRIZES

Established in 1944 by bequest of J.L.W. Gill, B.A., Principal of Hamilton Technical School. Nine scholarships to be awarded on the basis of Cumulative Area Averages to students who have completed Level I and 60-75 units of Honours B.Sc. programmes. Ordinarily, not more than one scholarship will be awarded in any one discipline.
Value: $250 each.

THE GEORGE P. GILMOUR MEMORIAL SCHOLARSHIP

Established in 1987 by the Graduating Class of 1962 in honour of Dr. G.P. Gilmour ('21), Chancellor of McMaster University from 1941 to 1950 and President and Vice-Chancellor from 1950 to 1961. To be awarded to a student who has completed Level I and 60-75 units of an Honours programme in the Arts and Science Programme and who, in the judgment of the Arts and Science Programme Admissions, Awards, and Review Committee, has demonstrated outstanding academic achievement and has made notable contribution to the campus or community by participation in extracurricular activities.
Value: $300.

THE H.B. GREENING BOOK PRIZE

Established in 1969 by bequest of Gladys Powis Greening in memory of her husband, Herald Benjamin Greening. To be awarded to the student who has completed Level I and 30-45 units of an Honours programme in Music and who, in the judgment of the Department of Music, has demonstrated excellence in music.
Value: $150, for books.

THE RUTH AND JACK HALL PRIZE

Established in 1983 by Jackie MacDonald in memory of her parents. To be awarded to a student who has completed Level I and 60-75 units of an Honours or Major programme in Computer Science, or Level I and 70-90 units of a programme in Computer Engineering, and who attains the highest Cumulative Area Average or Cumulative Engineering Average.
Value: $200.

THE RONALD K. HAM MEMORIAL PRIZE

Established in 1971 in memory of Professor R.K. Ham by his friends and former colleagues. Awarded to the student who has completed Level I and at least 60 units and who, in the judgment of the Department of Materials Science and Engineering, shows most promise as a materials scientist or engineer.
Value: $100.

THE HAMILTON CHEMICAL ASSOCIATION PRIZE

Established in 1953 by the Trustees of the Hamilton Chemical Association in memory of Dean C.E. Burke. To be awarded to the student who has completed Level I and 30-45 units of an Honours programme in Chemistry and who attains the highest Cumulative Area Average.
Value: $200.

THE HAMILTON ECONOMIC DEVELOPMENT COMMISSION SCHOLARSHIPS

Established in 1976. (a) Two scholarships to be awarded on the basis of Sessional Average to students entering Level II of a Commerce programme; (b) Four scholarships to be awarded on the basis of the Cumulative Commerce Average: two to students who have completed Level I and 30-45 units, and two to students who have completed Level I and 60-75 units of a programme in Commerce. Recipients must have obtained all their secondary school education in the Hamilton-Wentworth Region.
Value: $750 each (six awards).

THE DONALD HART SCHOLARSHIP

Established in 1985 by Mrs. Pamela Hart and Joel Jordan in honour of Donald Neil Hart ('70). To be awarded to a student who has completed Level I and 30-45 units of a programme in Commerce and who, in the judgment of the Faculty of Business, has achieved high standing in the required Level II Commerce courses, taken in one Session.
Value: $400.

THE ROSE HILL SCHOLARSHIP

Established in 1985 by the alumni, faculty and staff of the School of Physical Education and Athletics as a tribute to Professor Rose Hill, long-time teacher, coach and administrator in the School. To be awarded to a student who has completed Level I and 32-45 units of the Physical Education programme and who, in the judgment of the School, best demonstrates the philosophy of physical education espoused by Professor Hill throughout her career, namely, excellence in scholarship and leadership and participation in sport, dance or fitness.
Value: $600.

THE DR. THOMAS HOBLEY PRIZE

Established in 1936 by bequest of Mrs. A. McNee of Windsor. To be awarded to a woman student on the basis of the Sessional Average obtained in the penultimate level of a programme in economics or political science.
Value: $200.

THE DR. HARRY LYMAN HOOKER SCHOLARSHIPS

Established in 1981, and resulting from the bequest of Dr. H.L. Hooker. Awarded for overall academic excellence (Sessional Average of at least 9.5) to students in undergraduate programmes, with the exception of those in their graduating Session and those retaining scholarships of $1,000 or greater. Each year quotas are established for each Faculty and other academic units in proportion to the number of full-time undergraduate students who obtain a Sessional Average of 9.5 or greater. One hundred awards were made in 1988.
Value: $1,300 each.

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (HAMILTON SECTION) PRIZES

Established in 1961. Two prizes to be awarded to the students who have completed Level I and 70-90 units of a programme in Electrical Engineering who attain the highest and second highest Cumulative Engineering Averages.
Value: $150 and plaque; and $100.

THE INTERMETCO LIMITED SCHOLARSHIP

Established in 1977. To be awarded to the student who has completed Level I and 70-90 units of a programme in Mechanical Engineering and who, in the judgment of the Department of Mechanical Engineering, has attained notable standing.
Value: $600.

THE ITALIAN MINISTER OF EDUCATION SCHOLARSHIP

Established in 1987 by the Italian Minister of Education through the office of the Director of the Italian Cultural Institute in Toronto. To be awarded to the student who has completed Level I and 60-75 units of an Honours programme in Italian

and who has attained the highest Cumulative Area Average in the Italian component of the programme.
Value: $500.

THE ITCA COMMUNITY INVOLVEMENT PRIZE

Established in 1982 by Italian Canadian Community Involvement Incorporated. To be awarded to the student who has attained the highest Sessional Average on completion of Level I and 60-75 units of an Honours programme in Italian. The recipient must have graduated from a secondary school in the Hamilton area.
Value: $150.

THE IVEY SCHOLARSHIP

Established in 1971 by Professor and Mrs. G.S. French in memory of Mr. and Mrs. I.E. Ivey, the parents of Mrs. French. To be awarded to the student who has completed Level I and 60-75 units of an Honours programme in Music and who, in the judgment of the Department of Music, has attained notable standing.
Value: $125.

THE A.I. JOHNSON SCHOLARSHIP

Established in 1977 in memory of Dr. A.I. Johnson by his friends and former colleagues. To be awarded to a student who has completed Level I and 110-130 units of a programme in Engineering and Management. Award to be based on distinguished academic performance during the student's undergraduate career. Consideration will also be given to noteworthy contribution in extracurricular activities.
Value: $650 and certificate.

THE KATHLEEN MARY JOHNSTON MEMORIAL PRIZE

Established in 1963 by Lawrence D. Johnston in memory of his wife. To be awarded to the student who has completed Level I and 30-45 units of an Honours programme in Religious Studies and who attains the highest Cumulative Area Average.
Value: $125.

THE JURY PRIZE

Established in 1941 by bequest of J.H. Jury of Bowmanville. To be awarded to the student who has completed Level I and 30-45 units of the Honours History programme and who attains the highest Cumulative Area Average.
Value: $150.

THE STANFORD N. KATAMBALA GEOLOGY PRIZE

Established in 1965 by contributions from friends and associates of Stanford N. Katambala, a Year III Honours Geology student from Tanzania, killed in a mine accident in northern Ontario in September, 1964. To be awarded to a student who has completed Level I and 60-75 units of the Honours Geology programme and who attains high standing in geology.
Value: $50.

THE GEORGE P. AND LEATHA M. KEYS SCHOLARSHIPS

Established in 1982 by Mrs. Leatha Keys. Three scholarships to be awarded to students who, in the judgment of the Departments of Computer Science and Systems, and of Mathematics and Statistics, have demonstrated outstanding achievement in Honours and Major programmes in those Departments: (a) one to a student who has completed Level I and 30-75 units of the Computer Science programme; (b) one to a student who has completed Level I and 60-75 units of a programme in Mathematics; and (c) one to a student who has completed Level I and 60-75 units of a programme in Statistics.
Value: $400 each.

THE KIT MEMORIAL SCHOLARSHIP

Established in 1936 by the Hamilton Branch of the Canadian Women's Press Club (now the Media Club of Canada, Hamilton Branch) in memory of the brilliant journalist and writer, the first president of the Canadian Women's Press Club, Kathleen Blake Coleman, widely known on this continent as *Kit*. To be awarded to a woman student either on completion of Level I and at least 30 units on the basis of journalistic ability or on completion of Level I and 60-75 units of an Honours programme in English on the basis of Cumulative Area Average.
Value: $200.

THE HOWARD O. LAWRENCE SCHOLARSHIP

Established in 1988 by Industrial Ceramics Limited. To be awarded to a student entering Level IV of the Ceramic Engineering and Management programme and who, in the judgment of the Department of Materials Science and Engineering, has achieved high standing in Level III of the programme.
Value: $500.

THE MEGAN LAWRENCE SCHOLARSHIP

Established in 1988 by the Zonta Club of Hamilton II in memory of Megan Lawrence, Zontian and educator in the City of Hamilton. To be awarded to a student who has completed Level I and 68-85 units of the Physical Education programme and who, in the judgment of the School of Physical Education and Athletics, demonstrates excellence in scholarship, leadership and participation in sport, dance and fitness.
Value: $700.

THE RAY LAWSON SCHOLARSHIPS

Established in 1975 by the Honourable Ray Lawson, O.B.E., D.C.L, D.Cn.L., LL.D., K.G.St.J., Lieutenant-Governor of Ontario from 1946 to 1952. Two scholarships to be awarded for the highest Cumulative Engineering Averages in an Engineering and Management programme: (a) one to a student who has completed Level I and 70-90 units, and (b) one to a student who has completed Level I and at least 110 units beyond Level I.
Value: $400 each.

THE BETTY MacMILLAN PRIZE

Established in 1960 by her classmates in memory of Elizabeth Johnstone MacMillan ('50). To be awarded to the student who has completed Level I and 60-75 units in an Honours programme in Sociology and who, in the judgment of the Department of Sociology, is the most promising student.
Value: $100.

THE LIANNE MARKS SCHOLARSHIP

Established by her family, in 1980 as a bursary and in 1985 as a scholarship, in honour of Lianne Marks, a student at McMaster University (1977-80). To be awarded to a student who has completed Level I and 60-75 units of an Honours programme in Sociology and who, in the judgment of the Department of Sociology, has demonstrated outstanding academic achievement and has made notable contribution to the campus or community by participation in activities other than sports.
Value: $600.

THE A.V. MASON SCHOLARSHIP

Established in 1988 by Hamilton Porcelains Limited in honour of its former President. To be awarded to a student entering Level II of the Ceramic Engineering and Management programme who, in the judgment of the Department of Materials Science and Engineering, has achieved notable academic standing.
Value: $500.

THE RONALD E. MATERICK SCHOLARSHIP

Established in 1987 by Ronald E. Materick ('70). To be awarded to a student who has completed Level I and 70-85 units of a programme in Civil Engineering and who, in the judgment of the Department of Civil Engineering and Engineering Mechanics, has attained notable academic standing.
Value: $500.

THE McGREGOR-SMITH-BURR MEMORIAL SCHOLARSHIP

Established in 1910 by the Class of 1912 in Arts, in memory of their classmates, Percy Neil McGregor, Lee Wilson Smith and George William Burr, and supplemented in 1944 by bequest from Professor R. Wilson Smith, father of Lee Wilson Smith. To be awarded to the student who has completed Level I and 60-75 units of the Honours English and History programme and who has the highest Sessional Average.
Value: $450.

THE BOYD McLAY SCHOLARSHIP IN PHYSICS

Established in 1977 to commemorate the contributions of Dr. A. Boyd McLay ('22) to teaching and research in optics and spectroscopy at McMaster University from 1930 to 1967. To be awarded to a student who has completed Level I and 60-75 units of an Honours or Major programme in Physics with a high Sessional Average.
Value: $300.

THE McMASTER NURSING ALUMNI PRIZE

Established in 1984 by the Nursing Chapter of the McMaster University Alumni Association. To be awarded to a student who has completed Level I and 70-85 units of the Nursing programme and who, in the judgment of the School of Nursing, has demonstrated leadership while participating in undergraduate activities.
Value: $100 and book.

THE SIMON McNALLY SCHOLARSHIPS

Established in 1972 by S. McNally and Sons, Limited, in honour of Simon McNally. One or two scholarships to be awarded to Canadian citizens who have completed Level I and 35-50 units of a programme in Civil Engineering. Awards are based on scholarship and evidence of practical engineering experience and background.
Value: $650 each.

THE PETER McPHATER MEMORIAL SCHOLARSHIP

Established in 1988 by Peter McPhater's friends in recognition of his art, craftsmanship and humanitarianism. To be awarded to a student who has completed Level I and 60-75 units of a programme in Honours Art or Honours Art History and who, in the judgment of the Department of Art and Art History, is outstanding.
Value: $500.

THE J. J. MILLER PRIZE

Established in 1984 by friends, colleagues and former students in recognition of Professor J.J. Miller for his outstanding contribution to the Department of Biology during 37 years of service. To be awarded to a student entering Level IV of the Honours Biology programme with an outstanding Cumulative Area Average and a grade of at least A− in Biology 3E03 in Level III.
Value: $250.

THE MICHAEL J. MORTON MEMORIAL BOOK PRIZE

Established in 1979 in memory of Dr. M.J. Morton. To be awarded to a student who has completed Level I and 60-75 units in an Honours or Major programme in Chemistry and who, in the judgment of the Department of Chemistry, is outstanding in the field of inorganic chemistry.
Value: $150, for books.

THE ELIZABETH MOSGROVE SCHOLARSHIP

Established in 1959 by bequest of John W. Mosgrove in memory of his mother. To be awarded to sons of members of Her Majesty's Canadian Armed Forces on the basis of Sessional Average.
Value: $350.

THE MOULTON COLLEGE SCHOLARSHIPS

Established in 1957 from funds originally subscribed by the Alumnae of Moulton College during the years 1946 to 1949 for the expansion of Moulton College. Two scholarships to be awarded to the women students of Moulton Hall with the highest Sessional Averages: (a) one after completion of Level I and 30-45 units, and (b) one after completion of Level I and 60-75 units.
Value: $800 each.

THE MURATA ERIE NORTH AMERICA, LTD. SCHOLARSHIPS IN CERAMICS AND ELECTRONICS

Established in 1982. Two scholarships to be awarded on the basis of scholarship, general technical awareness and participation in university and community activities: (a) one to a student who attains the highest Sessional Average on completion of Level I and 70-85 units of the Ceramic Engineering programme and who in that Session attains a grade of at least A− in Materials 3B04, and (b) one to a student who attains the highest Sessional Average on completion of Level I and 70-85 units of the Electrical Engineering programme and who in that Session attains an average of at least 10.0 in Electrical Engineering 3DB3 and 3FB3.
Value: $600 each.

THE ANNE MURRAY SCHOLARSHIP

Established in 1985 in memory of Anne M. Murray ('82) by her family. To be awarded to the student who has completed Level I and 60-75 units of an Honours programme in German with the highest Sessional Average.
Value: $300.

THE THOMAS NEILSON SCHOLARSHIP

Established in 1986 in memory of Professor T. Neilson by his family, friends, colleagues and students. To be awarded to a student entering Level IV of a programme in Honours Biochemistry who, in the judgment of the Department of Biochemistry, shows particular promise as an experimental scientist.
Value: $750.

THE NIEMEIER SCHOLARSHIP

Established in 1938 and augmented in 1952 by Dr. O.W. Niemeier. To be awarded to the student who attains the highest Cumulative Area Average at the completion of Level I and 38-55 units of the Nursing programme.
Value: $300.

THE FREDRIC P. OLSEN BOOK PRIZE

Established in 1974 in memory of Professor F.P. Olsen by his family, friends and former colleagues. To be awarded to a student who has completed Level I and 60-75 units of an Honours or Major programme in Chemistry and who, in the judgment of the Department of Chemistry, shows particular promise as an experimental scientist.
Value: $100, for books.

THE ONTARIO HYDRO SCHOLARSHIP IN ELECTRICAL ENGINEERING

Established in 1986. To be awarded to the student who has completed Level I and 35-55 units of a programme in Electrical Engineering and who, in the judgment of the Department of Electrical and Computer Engineering, has achieved notable standing (Sessional Average of at least 9.5), displayed strong communication skills, and demonstrated leadership ability and involvement in extracurricular activities.
Value: $1,700.

THE PAIKIN SCHOLARSHIP

Established in 1957 in memory of Barney David Paikin ('33), by Mrs. Barney David Paikin and Morris Paikin. To be awarded to the student who has completed Level I and 60-75 units of the Honours History programme and who attains the highest Cumulative Area Average.
Value: $200.

THE GLADYS BALLANTYNE PARKER PRIZE

Established in 1953 in memory of Gladys Ballantyne Parker by her father, Harry Ballantyne. To be awarded to the student who has completed Level I and 30-45 units of a programme in Classics, Greek or Latin and who, in the judgment of the Department of Classics, is most promising.
Value: $50.

THE F.W. PAULIN SCHOLARSHIP

Established in 1981 by the Canadian Engineering and Contracting Co. Limited in honour of its founder. To be awarded to a student who has completed Level I and 70-85 units of the Civil Engineering programme, or Level I and 110-130 units of the Civil Engineering and Management programme. Award is based on scholarship (Sessional Average of at least 9.5) and evidence of leadership, self-motivation, and practical aptitude appropriate for a future in the construction industry.
Value: $1,100.

THE PEVENSING SCHOLARSHIP

Established in 1987 by David C. Hannaford ('64). To be awarded to a student who has completed Level I and 60-75 units of an Honours programme in Economics and who, in the judgment of the Department of Economics, has attained notable academic standing.
Value: $500.

THE PIONEER GROUP LIMITED SCHOLARSHIP

Established in 1988. To be awarded to a student who has completed Level I and at least 30 units of a programme in Gerontolgy and who, in the judgment of the Gerontology Committee on Instruction, achieves high standing in 12 units of Gerontology courses (excluding Gerontology 1A06) and who, demonstrates leadership in the field of Gerontology.
Value: $300.

THE PRICE WATERHOUSE AND CO. SCHOLARSHIP

Established in 1959 by Price Waterhouse and Co. To be awarded to the outstanding student on the basis of qualifications and academic record after completion of Level I and 60-75 units of a programme in Commerce. Preference will be given to students who plan to continue their studies after graduation with a practicing firm of chartered accountants.
Value: $350.

THE PSYCHOLOGY SOCIETY PRIZES

Established in 1985 by the Psychology Society and the Faculty and Alumni of the Department of Psychology. Three prizes to be awarded to students who have completed Level I and 60-75 units with the highest Cumulative Area Average: (a) one in the Honours Psychology B.A. programme; (b) one in the Honours Psychology B.Sc. programme; and (c) one in a combined Honours programme in Psychology.
Value: $50 each.

THE DR. JOHN A. PYLYPIUK SCHOLARSHIP

Established in 1967 in memory of Dr. John A. Pylypiuk and in recognition of Canada's Centennial Year. To be awarded to the student who has completed Level I and 30-45 units of an Honours programme in History with the highest Sessional Average and who in that Session achieves a grade of at least A− in History 2J06 (Canadian history).
Value: $600.

THE SHARON REEVES SCHOLARSHIP

Established in 1987 by Kevin W. Reeves ('80) in memory of his wife, Sharon ('79). To be awarded to a student entering Level III or IV of an Honours programme in Music (Education) and who, in the judgment of the Department of Music, has attained notable standing.
Value: $300.

THE ELLA JULIA REYNOLDS SCHOLARSHIPS

Established in 1984 by bequest of Ella Julia Reynolds of Hamilton. Two scholarships to be awarded on the basis of scholarship and character to students who have completed Level I and 30-75 units of the Honours English or the Honours English and History programmes with a Sessional Average of at least 9.5. The recipients must not be holders of another scholarship.
Value: $1,250 each.

THE HERBERT A. RICKER SCHOLARSHIPS

Established in 1982 by bequest of Mrs. Edna Elizabeth Ross Reeves of Hamilton in memory of her husband, Herbert A. Ricker. Four scholarships to be awarded on the basis of scholarship (Sessional Average of at least 9.5) and character to: (a) two to students who have completed Engineering I, or Level I and 35-90 units of a programme in Engineering, and (b) two to students who have completed Natural Sciences I, or Level I and 30-75 units of a programme in Science. The recipients must not be holders of another scholarship.
Value: $1,250 each.

THE ROSART PROPERTIES INC. SCHOLARSHIP

Established in 1988 by John D. and Dominic J. Rosart of Burlington. To be awarded to a student who has completed Level I and 60-75 units of an Honours programme in Geography and who, in the judgment of the Department of Geography, has attained high academic standing.
Value: $350.

THE E. TOGO SALMON PRIZE IN HISTORY

Established in 1973 by friends and colleagues of Professor E.T. Salmon on his retirement, in recognition of his outstanding contribution to the Department of History. To be awarded to the student who has completed Level I and 60-75 units and who, in the judgment of the Department of History, attains notable standing in an Honours programme in History.
Value: $75, for books.

THE BEN SAUDER SCHOLARSHIP

Established in 1984 by Mr. Ben Sauder. To be awarded to a student entering Level II of a programme in Commerce on completion of Business I with an outstanding Sessional Average. The recipient must not be a holder of another scholarship.
Value: $700.

THE SHEILA SCOTT SCHOLARSHIP IN ENGLISH

Established in 1983 by graduates of McMaster University and friends in honour of Sheila Scott, Dean of Women from 1965 to 1982, in recognition of her outstanding contribution to the University community during 25 years of service. To be awarded to the student who has completed Level I and 60-75 units of the Honours English programme, and who attains the highest Cumulative Area Average.
Value: $350.

THE LARRY SEFTON SCHOLARSHIPS

Established in 1985 by the Hamilton Steelworkers Area Council in memory of Larry Sefton, area supervisor (1946-53) and director of District 6 (1953-73) of the United Steelworkers of America, to recognize his commitment to education, to working people, to unions and to the City of Hamilton. Three scholarships to be awarded: (a) one to a student entering Level II of a programme in Labour Studies who, in the judgment of the Committee of Instruction for Labour Studies, achieves notable standing in Level I; (b) one to a student entering Level III of a programme in Labour Studies with the highest Cumulative Area Average in Level II of a programme in Labour Studies; and (c) one to a full-time or part-time student entering Level IV of an Honours programme in Labour Studies.
Value: $300 each.

THE SHELL CANADA SCHOLARSHIPS IN ENGINEERING AND MANAGEMENT

Established in 1983. Three scholarships to be awarded to students who have completed Level I and at least 110 units of a programme in Engineering and Management. Awards will be based on scholarship and on the quality of and creativity shown in written and oral reports.
Value: $700 each.

THE SHENSTONE PRIZE

Established in 1903 by J.N. Shenstone of Toronto, and continued by members of his family. To be awarded to the student who has completed Natural Sciences I and who attains the highest average in any two of the Level I courses in chemistry, physics and biology.
Value: $125.

THE GERALD AND VERNA SIMPSON MEMORIAL SCHOLARSHIP

Established in 1957 by the children in memory of their parents. To be awarded to the student who has completed Level I and 30-45 units of the Honours Physics or the Honours Chemistry and Physics programme with a high Cumulative Area Average.
Value: $300.

THE PATRICIA L. SMYE MEMORIAL PRIZES

Established in 1972 by the Patricia Smye Memorial Fund Committee. Two scholarships to be awarded to students who have completed Level I and 30-45 units and who attain the highest Sessional Average: (a) one in the three-level English programme and (b) one in the three-level Psychology B.A. programme.
Value: $250 each.

THE SOCIETY OF MANAGEMENT ACCOUNTANTS OF ONTARIO SCHOLARSHIP

Established in 1983. To be awarded to the student who has completed Level I and 60-75 units of a programme in Commerce and who obtains the highest Sessional Average and in that Session attains a grade of at least A– in Commerce 3AA3.
Value: $500.

THE SONS OF ITALY OF ONTARIO SCHOLARSHIP

Established in 1971 by the Order Sons of Italy of Ontario. To be awarded to the student who has completed Level I and 30-45 units and who, in the judgment of the Department of Modern Languages, has attained notable standing in an Honours programme in Italian.
Value: $500.

THE SOUTH ONTARIO ECONOMIC DEVELOPMENT COUNCIL SCHOLARSHIPS

Established in 1973 by the South Ontario (formerly Niagara) Economic Development Council. Two scholarships to be awarded, normally one in each of the B.A. and B.Sc. programmes, to the students who have completed Level I and 60-75 units of the Honours Geography programme and who elect Geography 4C06 in their graduating Session. Awards are based on scholarship and interest in undertaking studies relating to regional development and regional planning in the Niagara Peninsula.
Value: $900 each.

THE SALVATORE SPITALE MEMORIAL PRIZE

Established in 1984 by the Spitale family. To be awarded to the student who has completed Level I and 30-75 units of an Honours programme in Italian and who, in the judgment of the Department of Modern Languages, has demonstrated academic excellence and an active involvement in community life.
Value: $100.

THE S.L. SQUIRE SCHOLARSHIPS

Established in 1938 by bequest of S.L. Squire of Toronto. Four awards to be made to students in any Level I programme who attain the highest standing in any two of Mathematics 1A06, 1B03, 1H05, 1N06, and in other tests provided for this scholarship by the Department of Mathematics and Statistics.
Value: $400 each.

THE CLARENCE L. STARR PRIZE

Established in 1946 in memory of Dr. C.L. Starr, M.D., LL.D., F.A.S.S., Professor of Surgery in the University of Toronto, and an honorary alumnus of McMaster University (LL.D. 1922). To be awarded to the student who has completed Nursing I and who attains the highest Sessional Average.
Value: $150.

THE MABEL STOAKLEY SCHOLARSHIP

Established in 1956 by the Young Women's Canadian Club of Toronto (now the Career Women's Canadian Club of Toronto). To be awarded to a woman student who has completed Level I and 30-45 units of any programme and who gives evidence of outstanding academic achievement and leadership.
Value: $400.

THE MARIE L. STOCK SCHOLARSHIP

Established in 1987 by the French Section of the Department of Romance Languages in honour of Marie L. Stock, Professor Emeritus of French, and Chairman of the Department of Romance Languages from 1962 to 1965. To be awarded to the student who has completed Level I and 60-75 units of an Honours programme in French and who, in the judgment of the Department of French, has achieved notable academic standing.
Value: $350.

THE TOBENA SWEET MEMORIAL PRIZE

Established in 1988 by the National Council of Jewish Women of Canada, Hamilton Section, from the bequest of Tobena Sweet of Hamilton. To be awarded to the student who has completed Level I and 70-85 units of a Nursing programme with the highest Sessional Average.
Value: $100.

THE JUANITA LeBARRE SYMINGTON SCHOLARSHIP

Established in 1981 by The Women's Art Association of Hamilton in memory of Juanita LeBarre Symington. To be awarded to the student entering the graduating Session of the Honours Art programme with the highest Cumulative Area Average. The recipient must be from the Hamilton-Wentworth Region.
Value: $300.

THE T.H.B. SYMONS SCHOLARSHIP IN CANADIAN STUDIES

Established in 1978. To be awarded to the student who attains the highest Cumulative Area Average in Canadian Studies after completion of Level I and 60-75 units of a programme in Canadian Studies.
Value: $250.

THE HUGH R. THOMPSON MEMORIAL PRIZE

Established in 1960 in memory of Dr. Hugh R. Thompson. To be awarded to the student who has completed Level I and 30-45 units of the Honours Geography or the Honours Geography and Geology programme with the highest Sessional Average.
Value: $200.

THE DR. R.A. THOMPSON PRIZE IN MATHEMATICS

Established in 1954 by bequest of Dr. Willliam Bethune, in memory of R.A. Thompson, B.A., LL.D., Principal of Central Collegiate Institute, Hamilton, from 1897-1919, in recognition of his contribution to education in Hamilton. To be awarded to the student who has completed Level I and 60-75 units of the Honours Computer Science, Honours Computer Science and Mathematics, Honours Computer Science and Statistics, Honours Mathematics or Honours Statistics programme, and who attains high Cumulative Area Average.
Value: $200.

THE THORNE, ERNST AND WHINNEY SCHOLARSHIP

Established in 1956 by Pettit, Hill and Bertram, Toronto, and continued after amalgamation of firms. To be awarded to an outstanding student on the basis of qualifications and academic record after the completion of Level I and 60-75 units of a programme in Commerce. Preference will be given to students who plan to continue their studies after graduation with a practicing firm of chartered accountants.
Value: $350.

THE TOUCHE ROSS AND CO. SCHOLARSHIP

Established in 1962. To be awarded to the student who has completed Level I and 60-75 units of a programme in Commerce and who attains a high Sessional Average and in that Session attains an average of at least 10.0 in Commerce 3AA3 and 3AB3.
Value: $300.

TRAC SCHOLARSHIPS

Established in 1984 by The Refractories Association of Canada. Two scholarships to be awarded to students who have completed Level I and 35-50 units and who attain a high Sessional Average: (a) one in the Ceramic Engineering programme and (b) one in the Chemical Engineering programme.
Value: $500 each.

THE UNIVERSITY WOMEN'S CLUB OF HAMILTON SCHOLARSHIP

Established in 1945 by the University Women's Club of Hamilton. To be awarded to the woman student who attains the highest Sessional Average in the penultimate level of any programme.
Value: $750.

THE UWC PAST PRESIDENTS' PRIZE

Established in 1976 by the Past Presidents of the University Women's Club of Hamilton on the occasion of the Club's 50th anniversary. To be awarded to the woman student who has completed Level I and 70-90 units of a programme in Engineering with the highest Cumulative Engineering Average.
Value: $100.

THE VAREY SCHOLARSHIP

Established in 1978 by J.C. Varey, Dundas, in memory of Albert E. Varey. To be awarded to the student who attains high standing in an Honours programme in Biology and who, in the judgment of the Department of Biology, shows an innovative approach to the study of ecology.
Value: $250.

THE WEISZ FAMILY FOUNDATION SCHOLARSHIP

Established in 1982. To be awarded to the student who has completed Level I and 60-75 units of the Honours Commerce programme and who attains the highest Sessional Average (at least 9.5).
Value: $1,500.

THE EMANUEL WILLIAMS SCHOLARSHIP IN PHYSICS

Established in 1948 by Arabel M. Williams of Port Colborne as a memorial to her brother. To be awarded to the student who has completed Level I and 30-45 units of an Honours programme in Physics with the highest Cumulative Area Average.
Value: $800.

THE JANICE WILSON MEMORIAL PRIZE
Established in 1961 in memory of Janice Mary Wilson of Stoney Creek. To be awarded to the woman student who has completed Level I and 30-45 units of the Honours History programme and who attains the highest Cumulative Area Average.
Value: $50.

THE WOMEN'S ART ASSOCIATION SCHOLARSHIPS
Established in 1969. Two scholarships to be awarded: (a) one to a student entering Level II and (b) one to a student who has completed Level I and 30-45 units of a programme in Honours Art or Honours Art History with the highest Sessional Average. The recipients must be from the Hamilton-Wentworth Region.
Value: $200 each.

THE WOMEN'S CANADIAN CLUB OF HAMILTON SCHOLARSHIP
Established in 1982 by the Women's Canadian Club of Hamilton. To be awarded to the student in Canadian Studies 1A06 who has attained the highest Sessional Average provided the grade in Canadian Studies 1A06 is at least A–
Value: $500.

THE IVOR WYNNE MEMORIAL PRIZE
Established in 1971 in memory of Ivor Wynne, Dean of Students. To be awarded to a student who has completed Level I and 60-75 units of the Physical Education programme and has demonstrated outstanding achievement in the programme.
Value: $200.

THE LILLIAN AND MANUEL ZACK SCHOLARSHIP
Established in 1984 by Lillian and Manuel Zack ('40) of Hamilton. To be awarded to a student who has completed Level I and 70-85 units of a programme in Nursing and who, in the judgment of the School of Nursing, has demonstrated achievement, initiative, and commitment to gerontological nursing through clinical practice, term papers, research interest, or community activities and who pursues these interests in Level IV.
Value: $600.

SENATE SCHOLARSHIPS

The following scholarships are awarded for general academic proficiency at the discretion of the Undergraduate Council.

Every full-time student who is eligible for review in May but is not graduating in any programme in any Faculty or other academic unit will be eligible for consideration for a Senate Scholarship, provided that he or she attains a Sessional Average of 9.5 in addition to meeting the conditions noted in Section 3, above.

In 1989, the value of a Senate Scholarship is $650.

Each year, quotas of Senate Scholarships are established for each Faculty and other academic units in proportion to the number of full-time undergraduate students enrolled. In 1988, 250 Senate Scholarships were awarded, all of which were funded by the donors listed below.

THE EDGAR R. ASHALL SCHOLARSHIP
Established in 1965 by bequest of his wife, Edith M. Ashall.

THE EDWIN MARWIN DALLEY MEMORIAL SCHOLARSHIPS
Established in 1965 by bequest of Edwin Marwin Dalley of Hamilton.

THE EDUCATION FOUNDATION OF THE FEDERATION OF CHINESE CANADIAN PROFESSIONALS OF ONTARIO SCHOLARSHIPS
Established in 1988 by the Foundation. Two scholarships to be awarded: (a) one to a student in a programme in Arts and Science, and (b) one, on a rotating basis, to a student in a programme in Chemistry, Mechanical Engineering, and Physics.

THE HAMILTON INDUSTRIAL SCHOLARSHIPS
Established in 1958.

THE BERTRAM OSMER HOOPER SCHOLARSHIP
Established in 1957 by bequest of Isobel F. Hooper. To be awarded in Arts.

THE NINA LOUISE HOOPER SCHOLARSHIP
Established in 1959 by bequest of Bertram O. Hooper.

THE TONY PICKARD MEMORIAL SCHOLARSHIP
Established in 1973 by his wife and family, in honour of Captain Antony F. Pickard, O.B.E., C.D., R.C.N. (Ret'd).

THE HILDA SAVAGE MEMORIAL SCHOLARSHIP
Established in 1960 by bequest of Bertha Savage.

THE SOMERVILLE SCHOLARSHIPS
Established in 1966 by bequest of William L. Somerville, architect of the McMaster University buildings of 1930.

THE STOBO SCHOLARSHIP
Established in 1957 by bequest of William Q. Stobo.

THE UNIVERSITY SCHOLARSHIPS
Made available from time to time by authorization of the Board of Governors of the University.

THE MARGUERITE Z. YATES SCHOLARSHIP
Established in 1960 by bequest of Mrs. W.H. Yates of Hamilton.

THE YATES SCHOLARSHIPS
Established in 1963 by bequest of William Henry Yates of Hamilton.

RESIDENCE SCHOLARSHIPS

Nine scholarships were established in 1982 by the University for students in residence at the University. Three were named in honour of Sheila Scott, Dean of Women from 1965 to 1982, in recognition of her outstanding contribution to the University community during 25 years of service.

In addition to meeting the conditions noted in Section 3 (above), the recipients must express intent to live in residence in the following academic year. The monetary benefits will be credited to residence fees in January.

The following scholarships are awarded to the student in each residence with the highest Sessional Average (at least 9.5) in an undergraduate programme, with the exception of those in their graduating Session:

Sheila Scott Scholarships for Brandon Hall (2 awards)
Sheila Scott Scholarship for Wallingford Hall
Bates Residence Scholarship
Edwards Hall Residence Scholarship
Matthews Hall Residence Scholarship
McKay Hall Residence Scholarship
Whidden Hall Residence Scholarship
Woodstock Hall Residence Scholarship

In 1989, the value of each scholarship is $300.

TRAVEL SCHOLARSHIPS

Students who wish to be considered for these awards should consult the Academic Awards Officer before December 1.

THE A.G. ALEXANDER SCHOLARSHIPS
Established in 1938 and augmented in 1946 by Sir Douglas Alexander, and members of his family, in memory of Archibald Grieg Alexander. Two scholarships to be awarded to students who have completed Level I and 60-75 units on the basis of excellence in a modern language or languages, English, and History (with emphasis on French). The purpose of the scholarships is to enable the winners to study abroad during the vacation before the final Winter Session.
Value: $4,000 each.

THE JOAN JACKSON DUNBAR TRAVEL SCHOLARSHIP
Established in 1960 by Mayor Lloyd D. Jackson ('09), LL.D ('55) and Mrs. Jackson of Hamilton in memory of their daughter, Joan ('40). To be awarded to a woman student who has completed Level I and 60-75 units of an Honours programme in English for excellence in the work of the programme (with emphasis on English). The winner must have secured all her secondary school education in Canada. The award is to be used for study and travel in the United Kingdom and Continental Europe during the vacation before the final Winter Session.
Value: $4,000.

THE HOWARD P. WHIDDEN SCHOLARSHIP
Established in 1941 by the Honourable Jacob Nicol ('00) of Sherbrooke, Quebec, in honour of Chancellor Howard P. Whidden, with a view to fostering relations of friendship and understanding between French-speaking and English-speaking Canadians. To be awarded to a student in his/her penultimate Level who shows ability and promise in the use of the French language. The recipient will spend some weeks of residence and study in a French-Canadian home during the summer vacation.
Value: $550.

THE T. RUSSELL WILKINS MEMORIAL SCHOLARSHIP
Established in 1963 by bequest of Mrs. T. Russell Wilkins (B.A. '18 Brandon, M.A. '32), daughter of former Chancellor Howard P. Whidden, in memory of her husband, Dr. T. Russell Wilkins ('11). To be awarded to a student who has completed Level I and 60-75 units of an Honours or Major programme in any one of the following subject fields (singly or in combination): Biochemistry, Biology, Chemistry, Geology, Materials Science, Physics. Candidates for this scholarship must have attained high standing in the subjects of their programme and must, in addition, have demonstrated a lively interest in the humanities and in the human and social implications of scientific developments. The purpose of the scholarship is to enable the winner to spend the summer before the final Winter Session in travel and study outside Canada.
Value $4,000.

4. Single Achievement Awards for Full-time and Part-time Students

The following awards are based on competition across the University or within a faculty or programme for a single achievement.

4.1 These awards, which are granted in June or November, are provided for either full-time or part-time students qualifying on the basis of achievement during the Summer or Winter Sessions immediately preceding the May review (or deferred examinations resulting therefrom).

4.2 In addition to meeting the General Conditions listed in Section 1, a student must obtain at the most recent review a University Average of at least 8.0 and no F grades.

4.3 The University Average will be used to break any tie in the competition for these awards.

THE ALUMNI CANADIAN GEOGRAPHY PRIZE
Established in 1985 by the Geography Branch of the McMaster University Alumni Association in recognition of Dr. Lloyd G. Reeds for his contribution to teaching during more than 35 years of service. To be awarded to the student who attains the highest grade in Geography 2E03 (geography of Canada).
Value: $100.

THE AMBASSADOR OF SPAIN BOOK PRIZES
Established in 1982. To be awarded to in-course students for excellence in Hispanic studies.

THE AMERICAN-STANDARD PRIZE
Established in 1978. To be awarded to the student in the Ceramic Engineering programme who attains the highest grade in Geology 2B04.
Value: $100.

THE SIDNEY L. BLUM SCHOLARSHIP
Established in 1969 by friends and associates in memory of Sidney L. Blum. To be awarded to a student in the Social Work programme who submits the most significant research paper, essay or report of a major project in the field of social justice.
Value: $300.

THE RUBY BROWN BOOK PRIZE IN ENGLISH
Established in 1970 by bequest of Mrs. Edgar Brown. To be awarded to a student in any Level I programme for the most creative essay in a Level I English course.
Value: $50.

THE CANADIAN CLUB OF HAMILTON SCHOLARSHIP
Established in 1956 by the Canadian Club of Hamilton. To be awarded to the student who, in the judgment of the Department of History, attains notable standing in a Level III course in Canadian history.
Value: $150.

THE JAMES ROBERTSON CARRUTHERS MEMORIAL PRIZE
Established in 1984 in memory of James Robertson Carruthers ('74) by his family and friends. To be awarded to the student who, in the judgment of the Department of History, attains notable standing in History 2H06 (United States history).
Value: $200.

THE CITIZEN ACTION GROUP PRIZE
Established in 1984 by the Citizen Action Group, Hamilton, to honour Professor Harry L. Penny, founding Director of the School of Social Work and Board Member of Citizen Action Group. To be awarded to the student in a programme in Social Work who submits an essay or report based on the student's field work experience that best addresses the need for innovative or non-traditional social work practice.
Value: $250.

THE CLASSICS BOOK PRIZES
Established by Professor A.G. McKay in 1963. Two prizes to be awarded to: (a) the student who attains the highest average in Classical Civilization 2B03 and 2C03 or Art History 2B03 and 2C03, taken in one Session; and (b) the student with the highest standing in Latin 2G03.

THE COMPARATIVE LITERATURE PRIZE
Established in 1988. To be awarded to a student in an Honours programme in Comparative Literature who, in the judgment of the Department of Modern Languages, has achieved notable standing in the Level II courses in Comparative Literature.
Value: $100.

THE CONSUL GENERAL OF ITALY BOOK PRIZE
Established in 1982. To be awarded to in-course students for excellence in Italian studies.

THE BEATRICE CORRIGAN MEMORIAL BOOK PRIZE
Established in 1980 in memory of Professor Beatrice Corrigan by her friends and colleagues. To be awarded alternately to the student who achieves the highest standing in Italian 3P03 and to the student who achieves the highest standing in Italian 3O03.
Value: $75.

THE CRANSTON PRIZES
Established in 1958 by William H. Cranston of Midland in honour of his parents, J. Herbert Cranston ('05) and Eva Wilkins Cranston ('07). Two prizes to be awarded for excellence in the study of Canadian literature: (a) one for the highest grade in English 2G06, and (b) one for the highest grade in English 2C03.
Value: (a) $150; (b) $100.

THE DRAMATIC ARTS BOOK PRIZE
Established in 1974 by Professor Ronald W. Vince. To be awarded to the student who attains the highest standing in Drama 1A06.

THE FRENCH GOVERNMENT BOOK PRIZES
To be awarded from time to time to in-course students for proficiency in Level I and in Level II French.

THE GERMAN EMBASSY BOOK PRIZE
To be awarded from time to time for in-course students for proficiency in Level III German.

THE GILMOUR MEMORIAL PRIZE
Established in 1927 by Year '27, in memory of Dr. Joseph Leeming Gilmour, Honorary President of their first year in 1923, and subsequently enlarged by his children. To be awarded to the student who attains the highest standing in Religious Studies 2E06.
Value: $100.

THE GREEK COMMUNITY OF BURLINGTON AND DISTRICT SCHOLARSHIP
Established in 1983. To be awarded to the student who obtains the highest standing in Greek 1Z06.
Value: $250.

THE HAMILTON ENGINEERING INSTITUTE PRIZE
Established in 1962 by the Hamilton Section of the Engineering Institute of Canada and continued by the Hamilton Engineering Institute. To be awarded to the student in Engineering I who attains the highest grade in Engineering 1C04.
Value: $50.

THE PAUL HYPHER PRIZE
Established in 1988 in memory of Paul F. Hypher by his friends and classmates. To be awarded to the student in a programme in Commerce who attains the highest standing in Commerce 2MA3.
Value: $50. for books.

THE MUNICIPAL CHAPTER OF HAMILTON, I.O.D.E., PRIZE
Established in 1944 by the Municipal Chapter of Hamilton, Imperial Order Daughters of the Empire. To be awarded to the student who attains the highest standing in a Level I History course.
Value: $150.

THE INTER NATIONES (BONN) BOOK PRIZE
To be awarded from time to time to in-course students for proficiency in German studies.

THE DR. S.P. KLIMASKO PRIZE
Established in 1973. To be awarded to the student who attains the highest standing in Ukrainian 2A06.
Value: $50.

THE LATIN PRIZE
Established in 1987 by Dr. John B. Clinard. To be awarded to a student who, in the judgment of the Department of Classics, has demonstrated notable achievement in Latin 1Z06.
Value: $100.

THE SAM LAWRENCE PRIZE
Established in 1957 by the East Hamilton Independent Labour Party C.C.F. Club in honour of Sam Lawrence. To be awarded to the student who, in the judgment of the Department of Economics, has demonstrated outstanding academic achievement in courses in labour economics.
Value: $175.

THE LINGUISTICS PRIZE
Established in 1988. To be awarded to a student in an Honours programme in Modern Languages and Linguistics who, in the judgment of the Department of Modern Languages, has achieved notable standing in Level II courses in Linguistics.
Value: $100.

THE MacGIBBON SCHOLARSHIP
Established in 1970 by bequest of Professor Duncan A. MacGibbon ('08). To be awarded to the student in an Honours programme in Economics who, in the judgment of the Department of Economics, stands highest in courses in economic history.
Value: $300.

THE WILLIAM MACKENZIE MEMORIAL PRIZE
Established in 1977 in memory of Professor William Mackenzie by his friends and colleagues. To be awarded to the student who, in the judgment of the Department of Economics, has demonstrated outstanding academic achievement in Economics 3J06 (Economic Development) or, in exceptional circumstances, for work in a related area.
Value: $200.

THE ELEANOR DORNBUSH MARPLES PRIZE IN ART HISTORY
Established in 1985 by Mrs. Barbara Niedermeier and her family in memory of her sister. To be awarded to a student who, in the judgment of the Department of Art and Art History, has demonstrated outstanding achievement in Art History 3V03.
Value: $100.

THE ELEANOR DORNBUSH MARPLES PRIZE IN DRAMATIC ARTS
Established in 1987 by Vaughan W. Marples in memory of his wife. To be awarded to the student who attains the highest grade in Drama 2C03.
Value: $100.

THE H.W. McCREADY PRIZE IN BRITISH HISTORY
Established in 1981 in memory of Professor H.W. McCready, a member of the Department of History from 1943 to 1975, by former students, colleagues, and friends. To be awarded to the student who, in the judgment of the Department of History, attains notable standing in History 2N06.
Value: $100.

THE JOHN McDIARMID PRIZE
Established in 1966. To be awarded to the student in Engineering I who obtains the highest standing in Physics 1D03.
Value: $100.

THE McMASTER MARKETING ASSOCIATION PRIZE
Established in 1986. To be awarded to the student who attains the highest standing in Commerce 3MA3 (Marketing Research).
Value: $100.

THE NEOSID CERAMIC ENGINEERING PRIZE
Established in 1978 by Neosid (Canada) Limited. To be awarded to the student who has completed Level I and at least 75 units of the Ceramic Engineering programme and who attains the highest standing in Ceramics 3A04.
Value: $50.

THE NEUROPSYCHOLOGY PRIZE
Established in 1987 by Stephen J. Siblock ('83). To be awarded to a student in a programme in Psychology who, in the judgment of the Department of Psychology, shows promise and who attains notable standing in Psychology 2W06.
Value: $150.

THE DERRY NOVAK SCHOLARSHIP
Established in 1984 by the Political Science alumni and colleagues in honour of Professor Derry Novak. To be awarded to the student in a programme in Political Science who, in the judgment of the Department of Political Science, has achieved high standing in Level III courses in political theory or political philosophy.
Value: $300.

THE PHYSICAL ANTHROPOLOGY PRIZES
Established in 1987 by Stephen J. Siblock ('83). Two prizes to be awarded to students in a programme in Anthropology who, in the judgment of the Department of Anthropology, show promise and who attain notable standing: (a) one for Anthropology 2E03, and (b) one in alternate years for Anthropology 3N06 and Anthropology 3O06.
Value: (a) $100; (b) $150.

THE PHYSICAL EDUCATION PRIZES
Established in 1982. Two prizes to be awarded to students who have completed the courses in Level III of the Physical Education programme: (a) one to a student who, in the judgment of the School of Physical Education and Athletics, has submitted an outstanding paper or project, and (b) one to the student who, in the judgment of the School of Physical Education and Athletics, has demonstrated outstanding improvement in academic standing throughout the programme.
Value: $50 each.

THE PROCOR LIMITED SCHOLARSHIP
Established in 1962. To be awarded to the student in a programme with a concentration in Russian studies who attains the highest standing in Russian 2A06.
Value: $150.

THE PSYCHOLOGICAL STATISTICS PRIZE
Established in 1987 by Stephen J. Siblock ('83). To be awarded to a student in a programme in Psychology who, in the judgment of the Department of Psychology, shows promise and who attains notable standing in Psychology 2G03.
Value: $100.

THE RAND MEMORIAL PRIZE OF CLASS '98
Established by the Class of '98 in Arts, on the occasion of the 25th anniversary of graduation, 1923, in memory of Chancellor Theodore Harding Rand, to encourage original literary work. To be awarded to the student who has completed Level I and 60-75 units and who, in the judgment of the Department of English, has made the most notable original contribution to student publications.
Value: $250.

THE ABRAHAM ROSENBERG MEMORIAL PRIZE
Established in 1986 by bequest of Abraham I. Rosenberg ('34) of Hamilton and Kitchener. To be awarded to the student who attains the highest standing in English 3B03 or Sociology 2X03.
Value: $150.

THE MORRIS AND SARAH ROSENHEAD MEMORIAL PRIZE
Established in 1988 by bequest of Sarah Rosenhead of Hamilton. To be awarded to the student who attains the highest standing in English 1D06.
Value: $125.

THE LARRY SAYERS PRIZE IN CHINESE HISTORY
Established in 1983 in memory of Larry P. Sayers ('82) by his friends. To be awarded to the student who, in the judgment of the Department of History, has demonstrated outstanding achievement in at least six units of courses work in Chinese history.
Value: $200.

THE SERBO-CROATIAN BOOK PRIZES
Established in 1982. Three prizes to be awarded to the in-course students who achieve the highest standing in Serbo-Croatian 1Z06.

THE SOCIAL WORK PRIZES
Established in 1982. Two prizes to be awarded to: (a) one to the student who attains the highest grade in Social Work 2B06 and (b) one to the student who attains the highest grade in Social Work 2D03.
Value: $50 each.

THE ANNE STEIN MEMORIAL PRIZE
Established in 1971 by friends and colleagues of Anne Stein. To be awarded to the student who attains the highest average in Social Work 3D06 and Social Work 3DD3.
Value: $100.

THE STO PRIZE IN GERONTOLOGY
Established in 1987 by the Superannuated Teachers of Ontario, District 13. To be awarded to the student who attains the highest standing in Gerontology 1A06.
Value: $75.

THE SWISS MINISTER TO CANADA BOOK PRIZES
Established in 1950. To be awarded from time to time to in-course students for proficiency in French, German, or Italian.

THE KENNETH W. TAYLOR BOOK PRIZE
Established in 1976 by his children in memory of Dr. Kenneth W. Taylor ('21), LL.D. ('50). To be awarded to the student who, in the judgment of the Department of Economics, has demonstrated outstanding academic achievement in courses within the area(s) of monetary economics and financial institutions and of public finance.
Value: $100.

THE MICHAEL THOMSON MEMORIAL BOOK PRIZES
Established in 1975 by the members of the Departments of German and Russian in memory of Michael Thomson, Supervisor of the McMaster University language laboratories from 1961 to 1975. Two prizes to be awarded: (a) one to the student who attains the highest standing in German 1Z06 and (b) one to the student who attains the highest standing in Russian 2C06.
Value: $50 each.

THE JOHN TOTH MEMORIAL PRIZE
Established in 1983 in memory of John Toth by his friends. To be awarded to the student who attains the highest average in any six units of Level III or IV Latin courses.
Value: $50.

THE UNIVERSITY PRIZES FOR SPECIAL ACHIEVEMENT
Established in 1973. Two prizes to be awarded in each Faculty and other academic units to students who exhibit exceptional skill and originality in a creative project (such as an essay, poem, sculpture, mathematical or scientific problem, engineering design) or a related series of such projects.
Value: $150 each.

THE R.M. WILES MEMORIAL BOOK PRIZE
Established in 1975 in memory of Professor Roy McKeen Wiles by his friends and colleagues. To be awarded to the student who, in the judgment of the Department of English, has written the best essay on a topic relating to English literature of the period 1660-1800.
Value: $200, for books.

5. Academic Awards for Part-time In-Course Students

The following awards are based on competition across the University or within a faculty or programme.

5.1 These awards, which are granted in November, are provided exclusively for part-time students regularly registered in fewer than 24 units in any session and qualifying on the basis of work included at the most recent review in other than their graduating session.

5.2 In addition to meeting the *General Conditions* listed in Section 1, a student must obtain at the most recent review a University Average of at least 8.0 and no F grades.

5.3 The University Average will be used to break any tie in the competition for these awards.

THE TED ALLEN BOOK PRIZE
Established in 1984 in memory of Frederick J. Allen, an employee and part-time student at McMaster University. To be awarded to the part-time student who attains the highest standing in English 2H06 (American literature).
Value: $50, for books.

THE ALUMNI ASSOCIATION SCHOLARSHIPS
Established in 1974 by the McMaster University Alumni Association and later augmented by bequest of Harold E. Amy. Two scholarships to be awarded to part-time students who have attained the highest University Average at the most recent review.
Value: $350 each.

THE SIDNEY L. BLUM SCHOLARSHIP
Established in 1981 in memory of Sidney L. Blum. To be awarded to a part-time student in the Social Work programme who submits the most significant research paper, essay or report of a major project in the field of social justice.
Value: $300.

THE WILLIAM J. McCALLION SCHOLARSHIPS
Five scholarships named in 1984 in honour of Professor McCallion (B.A. '43, M.A. '46), first Dean of the School of Adult Education from 1970 to 1978, in recognition of his outstanding contribution to adult education and to the Department of Mathematical Sciences during 41 years of service. To be awarded to part-time students who have attained the highest University Average at the most recent review.
Value: $250 each.

THE LARRY SEFTON SCHOLARSHIPS
Established in 1985 by the Hamilton Steelworkers Area Council in memory of Larry Sefton, area supervisor (1946-53) and director of District 6 (1953-73) of the United Steelworkers of America, to recognize his commitment to education, to working people, to unions and to the City of Hamilton. Two scholarships to be awarded to part-time students: one to a student in Level II and one to a student in Level III of a Labour Studies programme who, in the judgment of the Committee of Instruction for Labour Studies, achieve notable standing in Level I and Level II, respectively. In the absence of a qualified candidate, the award will be made to a full-time student.
Value: $300 each.

THE ANNE STEIN MEMORIAL PRIZE
Established in 1981. To be awarded to the part-time student who attains the highest standing in Social Work 3D09.
Value: $100.

THE UNIVERSITY SCHOLARSHIPS
Established in 1978. Fifteen scholarships to be awarded to part-time students who have attained the highest University Average at the most recent review.
Value: $250 each.

6. Academic Awards for Graduating Students

The following awards are based on competition across the University or within a faculty or programme.

6.1 These awards, which are granted in May, are provided exclusively for graduating students qualifying on the basis of achievement in their baccalaureate degree programme.

6.2 In addition to meeting the *General Conditions* listed in Section 1, a student must obtain:

a. a Graduation Average of at least 8.0;
b. at the most recent review a University Average of at least 8.0;
c. no F grades in the courses last taken equal to:
   i. *either* the number of units specified in the Calendar for the final level of their programme;
   ii. *or*, if the Calendar does not specify the programme work by individual levels, the final 30 units of work.

MEDALS

THE GOVERNOR GENERAL'S ACADEMIC MEDAL
Given by Her Excellency the Governor General of Canada. To be awarded to the student graduating from a first baccalaureate degree programme who had achieved the highest standing throughout the programme.

THE E.H. AMBROSE GOLD MEDAL
Established in 1971 by Clarkson Gordon in memory of their former Hamilton partner, E.H. Ambrose, member of the University's Board of Governors from 1957 to 1967 and its Chairman, 1965 to 1967, and augmented by Mrs. E. H. Ambrose in 1987. To be awarded to the student in the graduating class of a programme in Commerce who, on the basis of scholarship and leadership, is judged to be the outstanding member of the class.

THE ASSOCIATION OF PROFESSIONAL ENGINEERS GOLD MEDAL
Established in 1961 by the Ontario Professional Engineers Foundation for Education. To be awarded to the graduand of a programme in Engineering who attains the highest Graduation Average.

THE BASU MEDAL
Established in 1984 in memory of Professor Sanjoy Basu by friends, colleagues and accounting organizations. To be awarded to the graduating student who, in the judgment of the Faculty of Business, has displayed outstanding achievement in accounting and has attained an average of at least 10.0 in any four of Commerce 4AA3, 4AB3, 4AC3, 4AD3, 4AE3, 4AF3.

THE EZIO CAPPADOCIA MEDAL
Established in 1986 by Professor E. Cappadocia on the occasion of his retirement from the Department of History. To be awarded to a student graduating from an Honours programme in History who, in the judgment of the Department of History, has displayed outstanding achievement and has contributed to the Department's activities.

THE J.E.L. GRAHAM MEDAL
Established by the Faculty of Social Sciences in 1982 in recognition of Professor J.E.L. Graham for his outstanding contributions to the Faculty and the University during 32 years of service. To be awarded on the recommendation of the Faculty of Social Sciences to a student in the graduating class who, on the basis of scholarship, is judged to be an outstanding member of the class of Social Sciences graduands, and who has completed the programme primarily on a part-time basis.

THE AMELIA HALL GOLD MEDAL
Established in 1985 by members of the Class of '38 in recognition of Amelia Hall ('38), D. Litt. ('75), one of the great pioneers of Canadian theatre and a consummate actress, who performed on Canadian stage, screen, radio and television for 35 years. To be awarded to a graduating student who, in the judgment of the Committee of Instruction for Drama, has made a significant contribution to drama during the student's University career.

THE HUMANITIES MEDALS FOR SPECIAL ACHIEVEMENT
Established by the University in 1982. Up to five medals to be awarded to graduating students in the Faculty of Humanities in recognition of outstanding achievement in scholarship and contributions to the cultural and intellectual life of the University including such areas as the creative and performing arts and faculty government.

THE HURD MEDAL
Established in 1955 by Donald W. Hurd ('49) in memory of his father, Dean William Burton Hurd. To be awarded to a student at graduation for distinguished achievement in an Honours programme in which economics is a major field of study.

THE R.C. MCIVOR MEDAL
Established by the Faculty of Social Sciences in 1982 in recognition of Professor R.C. McIvor, former Dean of the Faculty, for his outstanding contributions to the Faculty and the University during 35 years of service. To be awarded on the recommendation of the Faculty of Social Sciences to the full-time student in the graduating class who, on the basis of scholarship, is judged to be the outstanding member of the class of Social Sciences graduands.

RING

THE BURKE MEMORIAL RING
Presented by science graduates of the University in memory of Dean C.E. Burke. To be awarded to a graduate of a B.Sc. programme who is named to the Deans' Honour List and who has made the most oustanding contribution to undergraduate activities.

SCHOLARSHIPS AND PRIZES

THE CAMERON D. ALLEN BOOK PRIZE
Established in 1978 in memory of Cameron D. Allen. To be awarded to a student graduating from an Honours programme in Geography who, in the judgment of the Department of Geography, shows outstanding achievement in studies in climatology.
Value: $50, for books.

THE ANTHROPOLOGY PRIZE
Established in 1982. To be awarded to the graduating student who has completed a programme in Anthropology primarily on a part-time basis and who, in the judgment of the Department of Anthropology, has demonstrated outstanding academic achievement.
Value: $50.

THE WILLIAM AND LIDA BARNS MEMORIAL PRIZE IN HISTORY
Established in 1969 by their son, William D. Barns, of Morgantown, West Virginia. To be awarded to the graduand who, in the judgment of the Department of History, has attained notable standing in the Honours History programme.
Value: $200.

THE MARION BATES BOOK PRIZE
Established in 1967, Centennial Year, by the Alumnae members of the McMaster Alumni Association in honour of Marion Bates, Dean of Women from 1947 to 1965. To be awarded to a student graduating from an Honours programme in History who, in the judgment of the Department of History, has displayed outstanding achievement in Canadian history courses consistently throughout the degree programme.
Value: $100, for books.

THE ABE BLACK MEMORIAL PRIZES
Established in 1982 by friends and colleagues of Dr. A.H. Black in memory of a distinguished member of the Department of Psychology from 1958 to 1978. Four prizes to be awarded: (a) one to the student who attains the highest Graduation Average in an Honours B.A. programme in Psychology; (b) one to the student who attains the highest Graduation Average in the Honours B.Sc. programme in Psychology; (c) one to the student who attains the highest Graduation Average in the Honours Biology and Psychology (Life Sciences) programme; (d) one to the student who, in the judgment of the Department of Psychology, has demonstrated outstanding achievement in Psychology 4D06 (Honours thesis).
Value: (a) $50; (b) $50; (c) $50; (d) $75.

THE RUTH BURKE MEMORIAL PRIZE

Established in 1963 by Dr. and Mrs. Herbert S. Armstrong in memory of Mrs. Charles E. Burke. To be awarded to the student in the Nursing programme who attains the highest Graduation Average. The Prize is a set of engraved sterling silver coffee spoons.

THE CANADIAN ASSOCIATION OF OCCUPATIONAL THERAPISTS BOOK PRIZE

Established in 1985. To be awarded to the student who has attained the highest Graduation Average in the Occupational Therapy programme.
Value: $75, for books.

THE CERTIFIED GENERAL ACCOUNTANTS ASSOCIATION PRIZE

Established in 1982 by the Certified General Accountants Association of Ontario. To be awarded to the graduating student who, in the judgment of the Faculty of Business, has displayed outstanding achievement in accounting and has attained an average of at least 10.0 in Commerce 3AA3, 3AB3, 4AA3 and 4AB3.
Value: $150.

THE DENTON COATES MEMORIAL SCHOLARSHIP

Established in 1982 in memory of Denton E. Coates ('70) by his friends. To be awarded to the graduand who, in the judgment of the Department of Materials Science and Engineering, has demonstrated outstanding achievement in independent research as exemplified by the senior thesis in Materials 4K04.
Value: $300.

THE LAURA DODSON PRIZE

Established in 1985 by Laura Dodson ('56). To be awarded to the student graduating from the Honours Arts and Science Programme who has displayed outstanding achievement in both arts and science.
Value: $150.

THE EUROPEAN HISTORY PRIZE

Established in 1986 by Professor Ezio Cappadocia, on the occasion of his retirement from the Department of History, in memory of his mentor, Professor Frank H. Underhill. To be awarded to a student graduating from an Honours programme in History who, in the judgment of the Department of History, has displayed outstanding achievement in European history courses consistently throughout the degree programme.
Value: $100.

THE FINANCIAL EXECUTIVES INSTITUTE PRIZE

Established in 1983 by the Hamilton Chapter of the Financial Executives Institute. To be awarded to the graduating student who, in the judgment of the Faculty of Business, has demonstrated outstanding achievement in courses in finance.
Value: $200.

THE GERONTOLOGY PRIZE

Established in 1988 by the Pioneer Group Limited. To be awarded to a student graduating from a programme in Gerontology who, in the judgment of the Gerontology Committee of Instruction, has demonstrated high academic achievement and leadership in extracurricular activities.
Value: $100.

THE HERITAGE HAMILTON FOUNDATION SCHOLARSHIP

Established in 1987 by the Heritage Hamilton Foundation. To be awarded to a graduand who, in the judgment of a selection committee, submits the outstanding thesis or major project on a subject related to conservation of heritage aspects of the built environment.
Value: $400.

THE IROQUOIS TROPHY

Established in 1970 by the Department of Mechanical Engineering. To be presented to a graduating mechanical engineer on the basis of academic excellence, participation in campus societies, clubs, or other activities, and general leadership. A replica of the Trophy is permanently held by each winner.

THE BURTON R. JAMES MEMORIAL PRIZE

Established in 1974 by his friends and colleagues in honour of Burton R. James ('39), Controller, 1963-71, Assistant Vice-President — Administration, 1971-73, McMaster University. To be awarded to the student who, in the judgment of the Faculty of Business, has attained an outstanding Graduation Average in a programme in Commerce.
Value: $150.

THE W. NORMAN JEEVES SCHOLARSHIP

Established in 1987 by the French Section, Department of Romance Languages, in honour of W. Norman Jeeves, Professor of French from 1965 to 1987. To be awarded to a graduand of an Honours programme in French who, in the judgment of the Department of French, has demonstrated outstanding academic achievement in the French component of the programme.
Value: $300.

THE FRANK E. JONES PRIZE

Established in 1982 in honour of Professor F.E. Jones for his outstanding contributions to the Department of Sociology. To be awarded to the full-time student with the highest Graduation Average in an Honours programme in Sociology.
Value: $50.

THE RUTH LANDES PRIZE

Established in 1982 in honour of Professor Ruth Landes for her outstanding contributions to the Department of Anthropology. To be awarded to the graduating full-time student in a three-Level programme in Anthropology who, in the judgment of the Department of Anthropology, has demonstrated outstanding academic achievement.
Value: $50.

THE FELIKS LITKOWSKI PRIZE IN POLITICAL SCIENCE

Established in 1987 by Albert Litkowski ('78) and Richard Litkowski ('86) in honour of their father. To be awarded to a full-time student graduating from an Honours programme in Political Science who, in the judgment of the Department of Political Science, has demonstrated outstanding academic achievement.
Value: $250.

THE AGNES AND JOHN MacNEILL MEMORIAL PRIZE

Established in 1946 by bequest of Annie May MacNeill ('03). To be awarded to the student graduating from an Honours programme in English who has attained the most notable standing in English throughout the degree programme.
Value: $150.

THE CATHERINE MacNEILL PRIZE

Established in 1946 by bequest of Annie May MacNeill ('03). To be awarded to a woman student in her graduating year who has attained notable standing in scholarship and has shown qualities of leadership.
Value: $150.

THE PILAR MARTÍNEZ PRIZE

Established in 1983 by Dr. Pilar Martínez. To be awarded to the student who has attained the highest Graduation Average in a programme in Hispanic Studies. The Prize is a handicraft object.

THE ESTHER McCANDLESS MEMORIAL PRIZE

Established in 1984 by friends and colleagues in memory of Professor E. L. McCandless, a humanitarian and distinguished member of the Department of Biology from 1964 to 1983. To be awarded to a student who achieves an outstanding Graduation Average in an Honours programme in Biology.
Value: $200.

THE JOHN R. McCARTHY SCHOLARSHIP

Established in 1987 by John R. McCarthy LL.D. ('65), former Deputy Minister of University Affairs and Deputy Minister of Education for the Province of Ontario. To be awarded to a student graduating from a programme in Arts & Science, Humanities, Science, or Social Sciences who enrols in the Faculty of Education of an Ontario university in the academic session immediately following graduation. The student selected will have made a contribution to the life of the University by displaying leadership in student government or student affairs and leadership and sportsmanship in athletic endeavours.

Applications and the name of two referees should be submitted to the Director of Student Financial Aid and Scholarships by May 1.
Value: $800.

THE WALTER SCOTT McLAY PRIZE

Established in 1938 in honour of Dean McLay, by his daughter, Mrs. R.R. McLaughlin (Marjorie McLay '25) and further enlarged in 1950 by A.H. Wilson of Woodstock. To be awarded to the student who attains the highest Graduation Average in an Honours programme in English.
Value: $250.

THE E.S. MOORE PRIZE IN GEOLOGY

Established in 1956 by Elwood S. Moore, LL.D. ('55). To be awarded to the student graduating in an Honours programme in Geology who, in the judgment of the Department of Geology, has attained the most notable standing in geology.
Value: $150.

THE P.L. NEWBIGGING PRIZES

Established in 1982 in recognition of Dr. Lynn Newbigging for his outstanding contributions to the Department of Psychology. Four prizes to be awarded to students with the highest Graduation Average: (a) one to a full-time student in the three-Level B.A. programme in Psychology; (b) one to a student in a B.A. programme in Psychology who has completed the programme primarily on a part-time basis; (c) one to a full-time student in the three-Level B.Sc. programme in Psychology; and (d) one to a student in a B.Sc. programme in Psychology who has completed the programme primarily on a part-time basis.
Value: $50 each.

THE ONTARIO ASSOCIATION OF PROFESSIONAL SOCIAL WORKERS PRIZE

Established in 1986 by the Hamilton Branch. To be awarded to the graduating student who attains the highest average in Social Work 4D06 and 4DD6.
Value: $125.

THE ONTARIO PHYSIOTHERAPY ASSOCIATION BOOK PRIZE

Established in 1985 by the Ontario Physiotherapy Association (Hamilton Branch). To be awarded to the student who has attained the highest Graduation Average in the Physiotherapy programme.
Value: $100, for books.

THE ONTARIO SOCIETY OF OCCUPATIONAL THERAPISTS PRIZE

Established in 1987. To be awarded to the graduand of the Occupational Therapy programme who attains the highest grade in Health Sciences 4D03.
Value: Plaque.

THE HARRY L. PENNY PRIZE

Established in 1984 in recognition of Professor Harry L. Penny, founding Director of the School of Social Work, for his outstanding contribution to the School. To be awarded to the student with the highest Graduation Average in the Social Work programme.
Value: $50.

THE PHYSICAL EDUCATION PRIZE
Established in 1982. To be awarded to the graduating student who, in the judgment of the School of Physical Education and Athletics, has submitted an outstanding paper or project.
Value: $50.

THE POLITICAL SCIENCE PRIZE
Established in 1982. To be awarded to a graduating student who has completed a programme in Political Science primarily on a part-time basis and who, in the judgment of the Department of Policital Science, has demonstrated outstanding academic achievement.
Value: $50.

THE POLITICAL SCIENCE HONOURS ESSAY PRIZE
Established in 1982. To be awarded to the student who, in the judgment of the Department of Political Science, has demonstrated outstanding achievement in Political Science 4Z06.
Value: $50.

THE LLOYD REEDS PRIZES
Established in 1983 in recognition of Dr. Lloyd G. Reeds for his outstanding contributions to the Department of Geography during 35 years of service. Four prizes to be awarded: (a) one to the student who attains the highest Graduation Average in an Honours B.A. programme in Geography; (b) one to the student who attains the highest Graduation Average in an Honours B.Sc. programme in Geography; (c) one to the student who attains the highest Graduation Average in a three-level B.A. or B.Sc. programme in Geography; and (d) one to the student who, in the judgment of the Department of Geography, has demonstrated outstanding achievement in Geography 4C06.
Value: $50 each.

THE RELIGIOUS STUDIES PRIZES
Established in 1982. Two prizes to be awarded to students who attain the highest Graduation Average in a three or four-level programme in Religious Studies: (a) one to a student who has completed the programme on a full-time basis, and (b) one to a student who has completed the programme primarily on a part-time basis.
Value: $50 each.

THE RELIGIOUS STUDIES HONOURS ESSAY PRIZE
Established in 1982. To be awarded to the student who, in the judgment of the Department of Religious Studies, has demonstrated outstanding achievement in Religious Studies 4GG3.
Value: $50.

THE SHELL CANADA PRIZES IN ENGINEERING AND MANAGEMENT
Established in 1983. Three prizes to be awarded to students graduating from an Engineering and Management programme. Awards will be based on scholarship and on the quality of and creativity shown in written communication.
Value: $225 each.

THE RICHARD SLOBODIN PRIZE
Established in 1982 in honour of Professor Richard Slobodin for his outstanding contributions to the Department of Anthropology. To be awarded to the graduating full-time student in an Honours Anthropology programme who, in the judgment of the Department, has demonstrated outstanding academic achievement.
Value: $50.

THE SOCIOLOGY PRIZES
Established in 1982. Two prizes to be awarded to students with the highest Graduation Average: (a) one to a student who has completed the three-level programme in Sociology on a full-time basis; and (b) one to a student who has completed a programme in Sociology primarily on a part-time basis.
Value: $50 each.

THE SOCIETY OF CHEMICAL INDUSTRY MERIT AWARDS
Established in 1961. Three plaques to be awarded: (a) one to a Chemical Engineering graduand, (b) one to an Honours Biochemistry or Honours Biochemistry and Chemistry graduand, and (c) one to an Honours Applied Chemistry, Honours Chemistry, Honours Chemistry and Geology, or Honours Chemistry and Physics graduand, who have attained the highest Graduation Average (at least 9.5) and have completed the programme in the normal number of years.

THE HARRY WAISGLASS BOOK PRIZE
Established in 1988 in honour of Harry Waisglass, the first Director of the Labour Studies Education Programme at McMaster. To be awarded to a student graduating from a programme in Labour Studies who, in the judgment of the Committee of Instruction for Labour Studies, has demonstrated outstanding achievement.

THE MARK WATSON MEMORIAL PRIZE IN HISTORY
Established in 1987 by friends in the Department of History in memory of Mark A. Watson ('86). To be awarded to a student graduating from a three-level programme in History who, in the judgment of the Department of History, has displayed outstanding achievement consistently throughout the degree programme.
Value: $100.

Supplementary Student Financial Aid

Bursaries

Most bursaries are awarded by the University Bursary Selection Committee on the basis of a general bursary application. Application forms are available from the Student Financial Aid and Scholarships Office, Hamilton Hall, Room 401, in October and January of each academic year. A covering letter describing his or her financial situation is required from each student. Any person who is registered and in good standing as a student of McMaster University is eligible to apply.

THE GARY ALLEN MEMORIAL BURSARY
Established in 1987 by friends and family of the late Gary Allen ('84) to assist a needy Commerce student in Year III or IV whose major area of study is accounting. Preference will be given to a mature student.

TOM ANDERSON MEMORIAL BURSARY
Established in 1988, a bursary to be awarded to a student attending his or her first year at McMaster in Business I. The student must have graduated from a secondary school in the Regional Municipality of Hamilton-Wentworth or the City of Burlington.

THE ATKINSON CHARITABLE FOUNDATION BURSARIES
A fund has been made available for the assistance of students who are residents in the Province of Ontario. A number of awards will be made on the basis of financial need and other considerations, according to regulations suggested by the Foundation.

THE J.P. BICKELL BURSARIES
The J.P. Bickell Foundation provides a sum of money to assist students specializing in geology. Recommendations are made by the Department of Geology.

THE DORIS PARTRIDGE COLE BURSARY
Established in 1981, this bursary is to be awarded to a worthy student in memory of Doris Partridge Cole ('45).

THE AUBREY DALGLEISH BURSARY
Established in 1985. To be awarded to a student in any programme with special preference given to handicapped students and/or students in the Faculty of Business.

PARTICIA ANNE DICICCIO MEMORIAL BURSARY
Established in 1988 this bursary is to be awarded to a student or students enrolled in a programme which includes Gerontology as a major, who is a Canadian citizen or permanent resident and who exhibits financial need.

THE EDITH E. FERRIE BURSARIES
Established in 1965 by the late Edith E. Ferrie. To be awarded to students in any programme.

THE EMMA FOX BURSARIES
Established in 1961 by the Wallingford Hall Committee of which Emma Fox was treasurer from 1918 to 1958. To assist female students in any programme.

THE JAMES EDWARD GRADER MEMORIAL BURSARY
Established in 1964 by his sister. To be awarded to a student specializing in Geology. Application should be made to the Department of Geology.

THE CITY OF HAMILTON BURSARIES
Established in 1959 by the City of Hamilton to commemorate the visit of Her Majesty Queen Elizabeth II and His Royal Highness Prince Philip to Hamilton in July, 1959. To assist Hamilton students.

THE HAMILTON CITIZENS' MEMORIAL BURSARIES
Established in 1947 by the Hamilton Citizens' Committee for War Services. Proceeds to be used to assist undergraduate students who are residents of the Hamilton-Wentworth Region.

THE M.A.(JACK) HASSAL BURSARY
Established by the Hamilton and District Chartered Accountants' Discussion Group in 1982 in memory of M.A. (Jack) Hassal. To assist a student in Commerce who is a Canadian citizen or permanent resident of Canada. It is hoped that recipients, after graduation, will reimburse the fund to the extent of their award so that the fund may assist increasing numbers of students.

THE JACK AND THELMA HEATH MEMORIAL BURSARIES
Established in 1985 by Norton Canada Inc. in memory of Jack and Thelma Heath, former employees of the Company, who were tragically killed in a boating accident. The fund provides up to four awards to assist students, with demonstrated financial need, in Level III or IV of the B.Sc.N. Programme (basic and/or post-diploma stream).

THE EDWIN W. HILBORN BURSARY
Established in 1965 by bequest of Edwin W. Hilborn. To be awarded to a student in any programme.

THE MARY A. HILL BURSARY
Established in 1976 by bequest of Mary A. Hill. To be awarded to a female student in any programme, preference to be given to one who has graduated from a secondary school in Hamilton.

THE JULIA HURTIG BURSARY
Established by family and friends of the late Julia Hurtig in 1985. This bursary will be awarded to a student entering Level II of the Faculty of Humanities, in good standing, who has made a special contribution to the McMaster community through involvement in university affairs. Preference will be given to a female student.

THE KHAKI UNIVERSITY AND YOUNG MEN'S CHRISTIAN ASSOCIATION MEMORIAL BURSARIES
Established in 1921 by the Khaki University of Canada and the Young Men's Christian Association. To assist students in any programme, preference to be given to children of war veterans.

THE RAYMOND C. LABARGE MEMORIAL BURSARIES
Established in 1973 by friends and associates in memory of Raymond C. Labarge ('36) of Ottawa. Four bursaries are available for senior undergraduate students. Applicants should have a record of academic performance that has normally been at the upper second-class level or higher. They should also have demonstrated a sense of social awareness, shown interest in and concern for others and been an active participant in University or general community affairs. Students should describe their qualifications for this bursary in the covering letter.

3M CANADA INC. BURSARY
Established in 1980, two bursaries to be awarded annually to an MBA student and to a student in Business or Science.

THE MCMASTER 1980 BURSARIES
Established in 1980 by the University to assist undergraduate students in any programme.

THE McMASTER ALUMNAE CENTENNIAL BURSARY
Established in 1988 by the McMaster Women's Alumni, Hamilton Branch, to be awarded to a mature student in his or her graduating year, who is a Canadian citizen or permanent resident and who exhibits financial need. Preference will be given to a single parent.

THE McMASTER STUDENTS' UNION BURSARIES
Established in 1982 by the McMaster Students' Union. To assist those undergraduate MSU members who demonstrate financial need.

THE MCMASTER WOMEN'S CLUB BURSARY
Established in 1983 by the McMaster Women's Club to assist a student beyond Level I in the University's B.Sc.N. programme.

THE A.J. MELLONI MEMORIAL FUND
To be awarded to a student in any programme.

MOUNT HAMILTON ROTARY CLUB BURSARY
Established in 1987, this busary is to be awarded to a student or students who demonstrate financial need.

THE JOHN DOUGLAS MOYER BURSARY
Established in 1986 by bequest of John Douglas Moyer to assist needy students.

THE O'SHAUGHNESSY BURSARY
Established in 1986 by the family and friends of the late Margaret O'Shaughnessy, R.N., this bursary is to be used to alleviate financial need for students pursuing an education in Nursing (basic or post-diploma stream) in Level II, III, or IV.

THE PROFESSIONAL ENGINEERS' WIVES ASSOCIATION BURSARY
Originally established in 1983 by the Professional Engineers' Wives Association to be awarded to a needy female Engineering undergraduate student who, because of extenuating circumstances, would be unable to continue her studies without such assistance.

THE JAMES AND ELIZABETH ROBERTS BURSARIES
Established in 1957 by R.H. Roberts in memory of his parents to assist any male student of good academic standing.

THE ERIC SCHLICHTING MEMORIAL BURSARY
Established in 1966 by his family, classmates and friends. To assist a student in a programme in Geochemistry, Geology, or other field of Science, in that order of preference. Application should be made to the Department of Geology.

THE SAM SMURLICK BURSARY
Established in 1978 by the Smurlick family in memory of Sam Smurlick ('35). To be awarded to a student in any programme.

SUNCOR INC. 1988 BURSARIES
Established in 1988, this bursary is awarded to a student who is a member of the federally designated groups for employment equity (women, native students, handicapped and the visible minorities) who is registered in a Chemical, Mechanical, Manufacturing or Materials Engineering programme.

UNIVERSITY WOMEN'S CLUB OF BURLINGTON MATURE WOMEN'S BURSARY
Established in 1988, a bursary to be awarded to a mature female student who demonstrates financial need, and who is a resident of Hamilton-Wentworth or Halton Region, preferably from the Burlington area.

THE UNIVERSITY WOMEN'S CLUB OF HAMILTON BURSARIES
Established in 1960 by the University Women's Club of Hamilton. To be awarded to female students in any programme.

BURSARIES FOR IN-COURSE VISA STUDENTS
Established in 1982 by the University to assist visa students in any programme.

THE WALLINGFORD HALL BURSARIES
Established through anonymous donations to assist needy students in any programme.

THE YATES BURSARIES
Established in 1963 by bequest of William Henry Yates of Hamilton. To assist students in any programme.

THE ZONTA CLUB OF HAMILTON I BURSARIES
Established in 1988 by the Zonta Club of Hamilton I to financially assist female students. Two bursaries to be awarded to students in good academic standing: a) one to a student specializing in Commerce; and b) one to a student specializing in Gerontology.

Short-Term Emergency Loans

Unless otherwise specified, application should be made to the Director of Student Financial Aid and Scholarships, Hamilton Hall, Room 401.

THE A.H. ATKINSON LOAN FUND
Established in 1967 by A.H. Atkinson to assist engineering students.

THE DEAN OF WOMEN'S EMERGENCY FUND
Established and continued by the McMaster alumnae and individual benefactors to assist female students. This fund is now administered by the Director of Student Financial Aid.

THE ENGINEERING INSTITUTE OF CANADA (HAMILTON SECTION) LOAN FUND
Established by the Hamilton Section of the Engineering Insitute of Canada to assist engineering students.

THE HAMILTON AUTOMOBILE CLUB PAST PRESIDENTS MEMORIAL LOAN FUND
Established in 1963 by the Hamilton Automobile Club as a tribute to its deceased past presidents. To be used to assist engineering students.

THE LOUISE HOLMES MEMORIAL LOAN FUND
Established in 1958 by her parents in memory of Louise Holmes, B.A. ('48). To assist female students in any programme.

THE I.O.D.E. LOAN FUNDS
Through the generosity of a number of the local Chapters, Imperial Order Daughters of the Empire, funds are provided to assist female students in any programme or as specified.

a. Edith M. Griffen Loan Fund.
Established in 1957 by Paardeburg Chapter, I.O.D.E., in honour of Mrs. H.S. Griffen.

b. Princess Marina Chapter, I.O.D.E., Loan Fund.
Established in 1975.

c. Emma Frances Pratt Chapter, I.O.D.E., Loan Fund.
Established in 1958. To assist female students in Levels III or IV of any programme.

d. Muriel Clark Riddell Loan Fund.
Established in 1964 by the Right Honourable Stanley Baldwin Chapter, I.O.D.E.

e. Sovereign Chapter, I.O.D.E., Loan Fund.
Established in 1960. To assist female students in the final level of any programme.

f. Margaret B. Sutterby Memorial Fund.
Established in 1955 by the 67th University Battery Chapter, I.O.D.E.

g. Wentworth Chapter, I.O.D.E., Loan Fund.
Established in 1953.

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS LOAN FUND
Established in 1968 by the Hamilton Section of the Institute of Electrical and Electronics Engineers. To assist students in a programme in Engineering.

THE RUSSELL E. LOVE MEMORIAL LOAN FUND
Established in 1951 by bequest through the Optimist Club of Hamilton. To assist male students in the penultimate or final level of an Arts programme.

THE McILROY LOAN FUND
Established in 1956 by the University Women's Club of Hamilton. To assist female students in the final level of any programme.

THE McMASTER ENGINEERING SOCIETY LOAN FUND
Established in 1971 by the McMaster Engineering Society for the provision of loans to engineering students.

THE PI BETA PHI FRATERNITY LOAN FUND
Established in 1958 by the local alumnae of Pi Beta Phi. To assist female students in any Level IV Honours Arts or Science programme.

THE PROFESSIONAL ENGINEERS' WIVES' ASSOCIATION LOAN FUND
Established in 1972 by the Professional Engineers' Wives' Association to provide loans for engineering students.

THE SOCIETY OF AUTOMOTIVE ENGINEERS (ONTARIO SECTION) LOAN FUND
Established in 1962 by the Ontario Section of the Society of Automotive Engineers. To assist students in a programme in Engineering.

THE IVOR WYNNE MEMORIAL LOAN FUND
Established in 1971 in memory of Ivor Wynne, Dean of Students. To assist students in any programme.

THE UNIVERSITY LOAN FUNDS
Small short-term emergency loans from the University funds are available to assist students in any programme.

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S. Maybee
B.A. Eddy
R. Nagy
S. Nesathurai
One vacancy to be filled

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R.J. Csicsai, B.A., M.A.
A.M. Ndlovu, B.Sc., M.A.Sc.
Three vacancies to be filled

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I.C. Morgan ('38), B.A., B.D., Th.M., D.D.

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The Reverend Melvyn R. Hillmer, B.A., B.D., Th.D., *Principal of the Divinity College*

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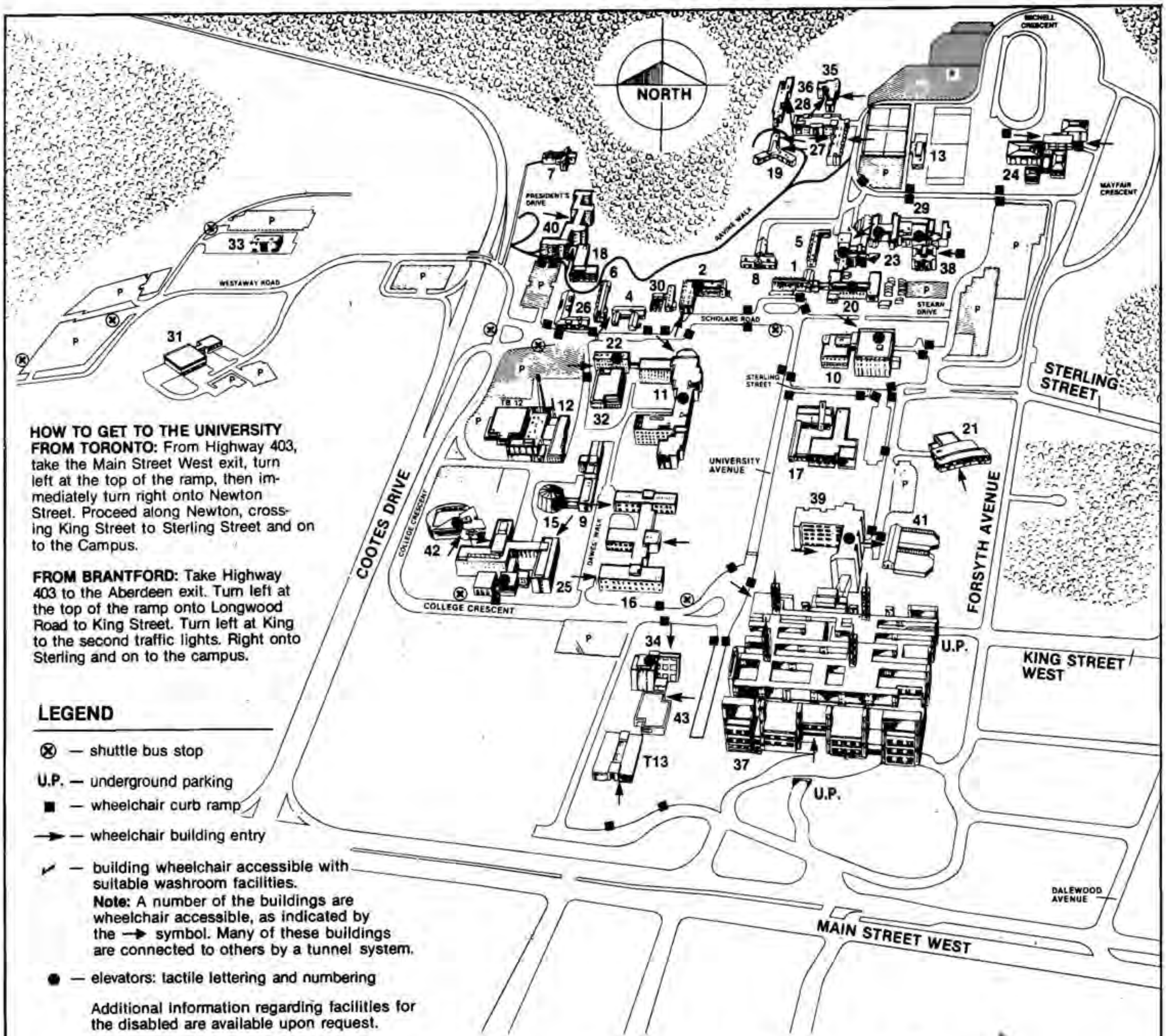
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WESTAWAY ROAD
SCHOLARS ROAD
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UNIVERSITY AVENUE
COOTES DRIVE
COLLEGE CRESCENT
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HOW TO GET TO THE UNIVERSITY FROM TORONTO: From Highway 403, take the Main Street West exit, turn left at the top of the ramp, then immediately turn right onto Newton Street. Proceed along Newton, crossing King Street to Sterling Street and on to the Campus.

FROM BRANTFORD: Take Highway 403 to the Aberdeen exit. Turn left at the top of the ramp onto Longwood Road to King Street. Turn left at King to the second traffic lights. Right onto Sterling and on to the campus.

LEGEND

⊗ — shuttle bus stop

U.P. — underground parking

■ — wheelchair curb ramp

→ — wheelchair building entry

✓ — building wheelchair accessible with suitable washroom facilities.
Note: A number of the buildings are wheelchair accessible, as indicated by the → symbol. Many of these buildings are connected to others by a tunnel system.

● — elevators: tactile lettering and numbering

Additional information regarding facilities for the disabled are available upon request.

McMaster University

The Campus

✓	A.N. Bourns Science Bldg.	25
	Alumni Memorial Hall	8
	Applied Dynamics Bldg.	33
	Bates Residence	40
	Biology Greenhouse	30
	Brandon Hall	36
✓	Burke Science Bldg.	11
	Campus Serv. Bldg.	31
✓	Chester New Hall	23
✓	Commons Bldg.	28
✓	Communications Research Lab	43
	Divinity College	17
	Edwards Hall	5
	E.T. Clarke Centre	12
	Faculty Club	8
✓	General Sciences Bldg.	22
	Gilmour Hall	20
✓	Hamilton Hall	2
✓	Health Sciences Centre	37
✓	Ivor Wynne Centre	24
✓	John Hodgins Engineering Bldg.	16
✓	Kenneth Taylor Hall	38
	Lewis Field House	13
✓	Life Sciences Bldg.	39
	Matthews Hall	26
	McKay Hall	27
✓	Mills Memorial Library	10
	Moulton Hall	18
	Nuclear Reactor	15
	Nuclear Research Bldg.	9
	Prelim. Lab Bldg.	T13
	President's Residence	7
✓	Psychology Bldg.	34
	Refectory	4
	Tandem Accelerator	32
✓	Thode Library of Science and Engineering	42
✓	Togo Salmon Hall	29
	University Hall	1
	Wallingford Hall	6
	Wentworth House	21
	Whidden Hall	19
	Woodstock Hall	35
	Parking Lots	P