McMaster University **School of Graduate Studies**

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February 7, 2013

To : Faculty of Science Graduate Curriculum, Policy, Admissions and Study Committee

From : Medy Espiritu
Assistant Secretary and SynApps System Administrator

The next meeting of the Faculty of Science Graduate Curriculum, Policy, Admissions and Study Committee will be held on **Wednesday, February 13, 2013** at **10:00 a.m.** in **MUSC-313**.

Listed below are the agenda items for discussion.

A G E N D A

I. Minutes of the meetings of February 13, 2012 and March 22, 2012

II. Business arising

III. 2013-2014 Graduate Curriculum Changes

a) **Biology** (Dr. B. Gupta)

New course:
*799 – Genetic Basis of Common Diseases

b) **Computational Science and Engineering** (Dr. Bartosz Protas)

- Clarification of language describing course work requirements

New courses:
*745 – Parallel and High-Performance Computing
*746 – Advanced Parallel and High-Performance Computing

Course cancellations:
#704 – Parallel Programming
#706 – Shared Memory Approaches to Parallel Applications

#709 – Optimization of Numerically Intensive Codes
#713 – The Message Passing Interface for Parallel Applications
#727 – Parallel and High Performance Computing Systems

c) **Geography and Earth Sciences** (Dr. Altaf Arain)

Change in course title and description:
*718 – Watershed Hydrology

Change in course description:
*736 – Geographies of Health

d) **Kinesiology** (Dr. Jim Lyons)

Course cancellation:
*707 – Cognitive Dysfunction and Perceptual Motor Performance

e) **Mathematics and Statistics** (Dr. Manfred Kolster)

Mathematics

- Ph.D. program: Change in comprehensive examination procedure

New course:
*797 – Industrial Project

Statistics (Dr. Manfred Kolster)

Change in course number and description:
*6K03 – Statistical Modelling in Practice

f) **Medical Physics and Applied Radiation Sciences** (Dr. Tom Farrell)

Change in course title and description:
*772 – Health Physics of Non-Ionizing Radiation

g) **Physics and Astronomy** (Dr. An-Chang Shi)

Change in course title:
*6S03 - Biophysics

h) **Collaborative program**

Astrobiology – calendar copy

New Courses:
*701 – Survey of Astrobiology
*705 – Astrobiology Research Seminar and Journal Club

FACULTY OF SCIENCE GRADUATE CURRICULUM, POLICY, ADMISSIONS AND STUDY COMMITTEE
FEBRUARY 13, 2012, 1:30 P.M.
MUSC-318

PRESENT: Dr. D. Welch (Chair), Ms. S. Baschiera (Secretary), Dr. P. Bennett, Dr. A. Adronov, Dr. A. Chen, Dr. T. Farrell, Dr. M. Kolster, Dr. J.P. Xu, Mrs. M. Espiritu (Assistant Secretary)

BY INVITATION: Dr. B. Milliken, Dr. B. Protas, Dr. N. Yiannakoulis

REGRETS: Dr. A. Arain, Dr. S. Phillips

I. Minutes of meeting

The minutes of the meeting of April 15, 2011 were approved on a motion by Dr. Chen, seconded by Dr. Farrell.

II. Business arising

There was no business arising from the minutes of the previous meeting.

III. Graduate curriculum revisions

Chemistry

Dr. Adronov reviewed the proposed curriculum changes for the Department of Chemistry.

Change in the calendar description of the Ph.D. comprehensive examination
The change will clarify what is required from students as part of their comprehensive examination.

The department also proposed cancellation of courses #734 – Applications of Mass Spectrometry, and #741 – Two Dimensional NMR Spectroscopy. A change in course titles was recommended for #737 – Mass Spectrometry Theory, and #740 – Basic Theory of NMR.

Dr. Adronov moved, and Dr. Chen seconded,

"that the Faculty of Science Graduate Curriculum, Policy, Admissions and Study Committee approve the proposed curriculum changes from the Department of Chemistry, as described in the documents."

The motion was **carried**.

Geography and Earth Sciences

In the absence of Dr. Arain, Dr. Yiannakoulis presented the proposal for two new courses from the School of Geography and Earth Sciences.

*6CC3 – Environmental Reconstruction Using Stable Isotopes
*6EA3 - Environmental Assessment

Dr. Farrell moved, and Dr. Xu seconded,

"that the Faculty of Science Graduate Curriculum, Policy, Admissions and Study Committee approve the two new courses, *6CC3 and *6EA3, as described in the documents."

The motion was **carried**.

Kinesiology

The Department of Kinesiology proposed to cancel courses *703 – Cardiac Rehabilitation and *710 – Exercise and Skeletal Development: A Lifespan Perspective.

Dr. Xu moved, and Dr. Bennett seconded,

"that the Faculty of Science Graduate Curriculum, Policy, Admissions and Study Committee approve the cancellation of courses *703 and *710, as described in the documents."

The motion was **carried**.

Mathematics and Statistics

Dr. Kolster discussed the following graduate curriculum changes for the Mathematics program:

New courses:

*6FM3 – Financial Markets and Derivatives
*6FT3 – Topics in Differential Equations
*6MB3 – Mathematical Biology

Course cancellations:

*6G03 – Dynamical Systems
*6K03 – Mathematics of Finance

Dr. Kolster moved, and Dr. Chen seconded,

"that the Faculty of Science Graduate Curriculum, Policy, Admissions and Study Committee approve the proposed changes for the Mathematics program, as described in the documents."

The motion was **carried**.

Statistics

Cancellation of course *6U03 – Nonparametric Methods in Statistics was proposed by the Department of Mathematics and Statistics.

Dr. Kolster moved, and Dr. Bennett seconded,

"that the Faculty of Science Graduate Curriculum, Policy, Admissions and Study Committee approve the cancellation of course *6U03 – Nonparametric Methods in Statistics, as described in the document."

The motion was **carried**.

Medical Physics and Applied Radiation Sciences

Dr. Farrell reviewed the change in course requirements for the M.Sc. Radiation Sciences (Medical Physics), M.Sc. Radiation Sciences (Radiation Biology), and M.Sc. Health and Radiation Physics. The change will require students in the three programs to take Medical Physics *773 – Basic Clinical Radiobiology. This new requirement satisfies the radiation biology component of the programs and replaces course *6U03 – Radiation Biology.

As a result of the change in course requirements, the department proposed cancellation of course *6U03 – Radiation Biology.

Dr. Farrell moved, and Dr. Xu seconded,

"that the Faculty of Science Graduate Curriculum, Policy, Admissions and Study Committee approve the curriculum changes proposed by the Department of Medical Physics and Applied Radiation Sciences, as described in the documents."

The motion was **carried**.

Physics and Astronomy

The department proposed to change the course description of #715 – Mathematical Introduction to Fluid Mechanics and #716 – Incompressible Computational Fluid Dynamics.

Dr. Adronov moved, and Dr. Farrell seconded,

"that the Faculty of Science Graduate Curriculum, Policy, Admissions and Study Committee approve the curriculum changes proposed by the Department of Physics and Astronomy, as described in the documents."

The motion was **carried**.

Psychology, Neuroscience and Behaviour

Dr. Milliken discussed the proposed change in admission requirements for the Ph.D. program in the Department of Psychology, Neuroscience and Behaviour. The change will no longer require applicants to submit the results of their Graduate Record Examination (verbal and quantitative).

Dr. Bennett moved, and Dr. Xu seconded,

"that the Faculty of Science Graduate Curriculum, Policy, Admissions and Study Committee approve the change in admission requirements for the Ph.D. program in Psychology, as described in the document."

The motion was **carried**.

IV. Additional agenda item

Computational Engineering and Science

Dr. Protas explained that the School of Computational Engineering and Science will move to the Faculty of Science effective July 1, 2012, and the Department of Mathematics and Statistics will handle administration of the School. With the transfer, Dr. Protas said the School felt the need to revise the course requirements for its Master's and Ph.D. programs to ensure that the requirements are aligned with the other graduate programs in the Faculty of Science. Dr. Protas reviewed the document and discussed the proposed changes: thesis-based Master's – four courses; course and project Master's – six courses; coursework-only Master's – eight courses; Ph.D. (with CES-equivalent Master's degree) – two 700-level courses; and Ph.D. (with only a Bachelor's degree) – six courses (five 700-level).

Dr. Kolster moved, and Dr. Bennett seconded,

“that the Faculty of Science Graduate Curriculum, Policy, Admissions and Study Committee approve the proposed change in the course requirements for the Master’s and Ph.D. programs in the School of Computational Engineering and Science, as described in the documents.”

The motion was **carried**.

Dr. Protas added that the School will submit more changes in future, such as the School’s new name and degree program names.

There was no other business. The meeting adjourned at 2:10 p.m.

FACULTY OF SCIENCE GRADUATE CURRICULUM, POLICY, ADMISSIONS AND STUDY COMMITTEE
MARCH 22, 2012, 11:00 A.M.
MUSC-311

PRESENT: Dr. D. Welch (Chair), Ms. S. Baschiera (Secretary), Dr. P. Bennett, Dr. A. Chen, Dr. T. Farrell, Dr. S. Phillips, Mrs. M. Espiritu (Assistant Secretary)

BY INVITATION: Dr. R. Pudritz

REGRETS: Dr. A. Adronov, Dr. M. Kolster, Dr. J.P. Xu

I. M.Sc. and Ph.D. collaborative programs in Astrobiology

Dr. Welch invited Dr. Pudritz to speak about the proposed M.Sc. and Ph.D. programs in Astrobiology. Dr. Pudritz explained that there is a growing interest in astrobiology programs at the graduate level in the U.S. The University of Washington (Seattle) and Penn State are the leading universities in the U.S. which offer collaborative astrobiology programs, accepting an average of five Ph.D. students per year. Other universities such as University of Arizona, Montana State University, and Arizona State University have started similar programs. Dr. Pudritz said the proposed program will attract students not only in Ontario, but across Canada because it is the first such program that will be established in the country. The program will be offered on a full-time basis. Part-time enrolment is possible in special circumstances. The following departments will be involved in the collaborative program: Biochemistry and Biomedical Sciences, Biology, Chemistry and Chemical Biology, Physics and Astronomy, and the School of Geography and Earth Sciences.

Dr. Chen moved, and Dr. Farrell seconded,

"that the Faculty of Science Graduate Curriculum, Policy, Admissions and Study Committee approve the proposed M.Sc. and Ph.D. collaborative programs in Astrobiology, as described in the document."

In response to a question, Dr. Pudritz said there are already two students in the department who are quite interested to enrol in the program once it has been established.

The motion was **carried**.

II. Change in name for the School of Computational Engineering and Science

In the absence of Dr. Protas, Dr. Welch explained that the move of the School of Computational Engineering and Science to the Faculty of Science necessitated the change in its name to "School of Computational Science and Engineering."

Dr. Farrell moved, and Dr. Phillips seconded,

"that the Faculty of Science Graduate Curriculum, Policy, Admissions and Study Committee approve the change in name of the School of Computational Engineering and Science to "School of Computational Science and Engineering."

The motion was **carried**.

The proposal to change the degree names has been withdrawn from the agenda.

There was no other business and the meeting adjourned at 11:20 a.m.

McMaster University

SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM	Biology			
COURSE TITLE	Genetic Basis of common diseases			
COURSE NUMBER	799	**COURSE CREDIT**		
		FULL COURSE ( )	**HALF COURSE (X)**	**QUARTER (MODULE) ( )**
INSTRUCTOR(S)	Suleiman Igdoura			
PREREQUISITE(S)	Undergraduate course in genetics and cell biology			

NATURE OF RECOMMENDATION ***(PLEASE CHECK APPROPRIATE BOX)***

NEW COURSE	X	**DATE TO BE OFFERED:** Sept 2013	**WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL?** No **IF YES, PROVIDE THE DATE:**

WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? No **IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.**

CHANGE IN COURSE TITLE		**PROVIDE THE NEW COURSE TITLE:**				
CHANGE IN COURSE DESCRIPTION		**600-LEVEL COURSE** ***(Undergraduate course for graduate credit) Please see #4 on page 2 of this form***				
CHANGE TO FULL COURSE		**CHANGE TO HALF COURSE**		**CHANGE TO QUARTER COURSE**		
COURSE CANCELLATION		**PROVIDE THE REASON FOR COURSE CANCELLATION:**				
OTHER CHANGES		**EXPLAIN:**				

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description *(maximum 6 lines)* to be included in the Graduate Calendar.

This course will focus on one of the most active areas of biomedical research, namely the genetics of common diseases. Topics include: etiology of disease, epidemiology, twin studies, animal models, linkage and segregation analyses.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

The course will cover the following topics for each disease:
(I) Disease definition
(II) Clinical presentation: prevalence; subtypes
(III)Genetic evidence:
1. Clinical epidemiology and ethnic differences
2. Gender
3. Family and twin studies
4. Segregation analyses
5. Environmental factors

(IV) Genetic studies of pathophysiology (i.e., animal models)
(V) Gene identification:
1. Linkage and association studies;
2. Genes involved

(VI) Gene-Environment Interactions
(VII)Therapy

List of Common Diseases to be covered

(I) Neuropsychiatric disorders

1- GM2 Gangliosidoses
2- Alzheimer's disease
3- Schizophrenia
4- Multiple sclerosis

(II) Gastrointestinal Diseases

5- Peptic ulcer
6- Lactase Deficiency
7- Inflammatory Bowel disease
8- Chronic liver disease

(III) Cardiovascular disease

9- Coronary atherosclerosis
10- Hypertension
11- Chronic obstructive pulmonary disease.
12- Stroke

(IV) Endocrine disorders

13- Obesity
14- Osteoporosis
15- Type I Diabetes Mellitus
16- Type II Diabetes Mellitus

(V) Rheumatologic diseases

17- Osteoarthritis
18- Rheumatoid arthritis

(VI) Cancer

19- Non-Hodgkin's lymphoma
20- Breast Cancer
21- Prostate Cancer

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)

It currently contains 12 X 3 hr sessions that will cover a wide range of topics relevant to the genetic basis of common diseases. The course will be an interactive forum between instructor and students that will consist of faculty presentations, student presentations and discussion sessions to highlight relevant and important aspects of each session. The course will emphasize the etiology of diseases and disease-causing genes.

2. EXPECTED ENROLMENT:

We are expecting enrolment of 10 graduate students from the Biology Program. The course will also be open to graduate students in Biochemistry, psychology and Medical Sciences. A maximum of 15 graduate students would be allowed. A minimum of 6 graduate students would be needed to run the course.

3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):

Each 3 hr session will consist of a faculty seminar (1 hr), 2 student presentations (2 X 45 min=1.5 hr) and a general discussion period (0.5 hr) that summarizes the key points raised by the guest faculty member/course co-ordinators. Course material for each session will be provided to the students one week prior to that session. Students will be required to obtain all assigned class papers/review articles as well as papers for student presentations one week prior to each session.

4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)

Methods of evaluation will consist of: submission of a CIHR style grant application (30%) and oral presentation (15%) of the grant proposal, student presentations of assigned topics (30%) and student participation (25%) which includes: class discussion/questions related to the faculty seminar, assigned papers for student presentations, round table discussions, and the summarization of key points for each session. Students will be expected to provide written feedback and critique of each student presentation for each session (evaluation forms will be provided for each session). In terms of the CIHR grant application, faculty will provide a minimum of two biological research problems that could be considered as a relevant research topic for a grant application. Students will have an opportunity of choosing one of these specific problems from the list and will be responsible for developing a grant proposal that spans both clinical and basic science aspects of the topic.

5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).

There is currently no other graduate course offered that has similar or identical content. This is a unique graduate course to be offered in the Biology Department that deals with the genetic basis of common diseases.

6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?

NA

PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Bhagwati Gupta, Associate Chair

Email: guptab@mcmaster.ca Extension: 26451 Date submitted: January 18, 2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012

McMaster University

SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING DEGREE PROGRAM REQUIREMENTS / PROCEDURES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** changes involving degree program requirements/procedures. **All** sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT	Computational Science and Engineering
NAME OF PROGRAM	

PROGRAM DEGREE	**Ph.D. ( )**	**M.A. ( )**	**M.A.Sc. (X)**	**M.B.A. ( )**	**M. Eng. (X)**	**M.Sc. (X)**	**Diploma Program ( )**	**Other *(Specify)***

NATURE OF RECOMMENDATION *(PLEASE CHECK APPROPRIATE BOX)*

CHANGE IN ADMISSION REQUIREMENTS		**CHANGE IN COMPREHENSIVE EXAMINATION PROCEDURE**		**CHANGE IN COURSE REQUIREMENTS**	

CHANGE IN THE DESCRIPTION OF A SECTION IN THE GRADUATE CALENDAR	X	**EXPLAIN:** Clarification of language describing coursework requirements
OTHER CHANGES		**EXPLAIN:**

DESCRIBE THE EXISTING REQUIREMENT/PROCEDURE:

Master's Degrees with Project

A candidate for a Master's degree with project is required to successfully complete a minimum of six half courses plus a research project. The project is to be decided jointly by the candidate and the supervisor, and approved by the Director. Of the six half courses, three must be chosen from the core courses, whereas the remaining three course may be chosen from those listed by the School, in consultation with the project supervisor. Up to two of the half courses may be at the 600-level. The School arranges a series of seminars; candidates are required to attend and participate, and may be required to present their research results as part of this series. Normally, this option will require 16 months residence. This option is not a preferred qualification for entrance to a Ph.D. program.

Master's Degrees by Coursework

A candidate for a Master's degree by coursework is required to successfully complete a minimum of eight half courses. Of these, four must be the core courses, whereas the remaining courses may be chosen from any of those listed by the School, in consultation with the Director. Up to two of the half courses may be at the 600-level. The School arranges a series of seminars; candidates are required to attend and participate. Normally, this option will require 12-16 months residency. This option is not a preferred qualification for entrance to a Ph.D. program.

PROVIDE A DETAILED DESCRIPTION OF THE RECOMMENDED CHANGE ***(Attach additional pages if space is not sufficient.)***

Master's Degrees with Project

A candidate for a Master's degree with project is required to successfully complete a minimum of six half courses plus a research project. The project is to be decided jointly by the candidate and the supervisor, and approved by the Director. Of the six half courses, ~~three must be chosen from the core courses~~, three must be the core courses, whereas the remaining three course may be chosen from those listed by the School, in consultation with the project supervisor. Up to two of the half courses may be at the 600-level. The School arranges a series of seminars; candidates are required to attend and participate, and may be required to present their research results as part of this series. Normally, this option will require 16 months residence. This option is not a preferred qualification for entrance to a Ph.D. program.

Master's Degrees by Coursework

A candidate for a Master's degree by coursework is required to successfully complete a minimum of eight half courses. Of these, ~~four must be the core courses~~, four must be the three core courses and the course, *Parallel and High Performance Computing* (CSE *745), whereas the remaining courses may be chosen from any of those listed by the School, in consultation with the Director. Up to two of the half courses may be at the 600-level. The School arranges a series of seminars; candidates are required to attend and participate. Normally, this option will require 12-16 months residency. This option is not a preferred qualification for entrance to a Ph.D. program.

RATIONALE FOR THE RECOMMENDED CHANGE:

Clarification of language describing coursework requirements

PROVIDE IMPLEMENTATION DATE: ***(Implementation date should be at the beginning of the academic year)***

ARE THERE ANY OTHER DETAILS OF THE RECOMMENDED CHANGE THAT THE CURRICULUM AND POLICY COMMITTEE SHOULD BE AWARE OF? IF YES, EXPLAIN.

PROVIDE A DESCRIPTION OF THE RECOMMENDED CHANGE TO BE INCLUDED IN THE CALENDAR:

See above

CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Bartosz Protas Email: bprotas Extension: 24116 Date submitted: Jan. 18, 2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012

McMaster University

SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM	Computational Science and Engineering			
COURSE TITLE	Parallel and High-Performance Computing			
COURSE NUMBER	CSE 745	**COURSE CREDIT**		
		FULL COURSE ( )	**HALF COURSE (X)**	**QUARTER (MODULE) ( )**
INSTRUCTOR(S)	TBD			
PREREQUISITE(S)				

NATURE OF RECOMMENDATION *(PLEASE CHECK APPROPRIATE BOX)*

NEW COURSE	X	**DATE TO BE OFFERED:** Fall 2013	**WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:**

WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? No **IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.**

CHANGE IN COURSE TITLE		**PROVIDE THE NEW COURSE TITLE:**				
CHANGE IN COURSE DESCRIPTION		**600-LEVEL COURSE** *(Undergraduate course for graduate credit) Please see #4 on page 2 of this form*				
CHANGE TO FULL COURSE		**CHANGE TO HALF COURSE**		**CHANGE TO QUARTER COURSE**		
COURSE CANCELLATION		**PROVIDE THE REASON FOR COURSE CANCELLATION:**				
OTHER CHANGES		**EXPLAIN:**				

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description *(maximum 6 lines)* to be included in the Graduate Calendar.

An introduction to general ideas and principles of parallel programming followed by a presentation of the shared-memory and message-passing approaches to parallel code development based on, respectively, the OpenMP and MPI standards. Students will develop simple parallel applications in C and FORTRAN. Students will acquire the skills necessary to operate, debug and modify existing parallel codes and available libraries (such as PDE solvers) using these standard approaches for various applications.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

The course offers an introduction to parallel and high-performance computing for students with no prior experience in this field, but already equipped with basic programming skills. It intends to train them in using and modifying existing parallel applications. The course will be a part of the core course offering in the CSE Program.

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)

The proposed new course is a part broader changes concerning advanced computational courses offered in the School. Previously offered 6-week modules are replaced with two half-courses, an introductory and an advanced one, which will cover similar material in an integrated manner. Such delivery of the material will ensure that students will achieve a clearly-defined competence level by taking each of the courses. In the past the required material was scattered across several modules which students had to take and which also had some overlap. This change reflects recent trends in teaching high-performance and parallel computing

2. EXPECTED ENROLMENT:

15

3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):

Weekly lectures (3 hours/week) including actual code development

4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)

The final mark will be based on assignments and/or project

5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).

No

6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?

No

PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Bartosz Protas Email: bprotas@mcmaster.ca Extension: 2416 Date submitted: January 18, 2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012

McMaster University

SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM	Computational Science and Engineering			
COURSE TITLE	Advanced Parallel and High-Performance Computing			
COURSE NUMBER	CSE 746	**COURSE CREDIT**		
		FULL COURSE ( )	**HALF COURSE (X)**	**QUARTER (MODULE) ( )**
INSTRUCTOR(S)	TBD			
PREREQUISITE(S)	CSE 744			

NATURE OF RECOMMENDATION ***(PLEASE CHECK APPROPRIATE BOX)***

NEW COURSE	X	**DATE TO BE OFFERED:** Fall 2013	**WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:**

WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? No **IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.**

CHANGE IN COURSE TITLE		**PROVIDE THE NEW COURSE TITLE:**				
CHANGE IN COURSE DESCRIPTION		**600-LEVEL COURSE** ***(Undergraduate course for graduate credit) Please see #4 on page 2 of this form***				
CHANGE TO FULL COURSE		**CHANGE TO HALF COURSE**		**CHANGE TO QUARTER COURSE**		
COURSE CANCELLATION		**PROVIDE THE REASON FOR COURSE CANCELLATION:**				
OTHER CHANGES		**EXPLAIN:**				

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description *(maximum 6 lines)* to be included in the Graduate Calendar.

The goal of this course is to equip students with theoretical knowledge and practical skills necessary to independently develop scalable parallel and high-performance codes for various applications. The course covers a selection of advanced topics concerning both software and hardware aspects of code development. Topics may include the use of parallel debuggers and profilers, optimization of numerically intensive codes for specific architectures, novel hardware (e.g. GPGPU cards) and related languages such as CUDA, mixed use of threads/OpenMP and message passing/MPI, issues with extreme parallel scaling such as I/O and fault tolerance and parallel languages such as CHARM++.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

The course is intended for students who have already taken an introductory course on parallel and high-performance computing such as CSE 744. It intends to train them in independent development parallel applications. The course will be a part of the core course offering in the CSE Program.

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)

The proposed new course is a part broader changes concerning advanced computational courses offered in the School. Previously offered 6-week modules are replaced with two half-courses, an introductory and an advanced one, which will cover similar material in an integrated manner. Such delivery of the material will ensure that students will achieve a clearly-defined competence level by taking each of the courses. In the past the required material was scattered across several modules which students had to take and which also had some overlap. This change reflects recent trends in teaching high-performance and parallel computing.

2. EXPECTED ENROLMENT:

8

3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):

Weekly lectures (3 hours/week) including actual code development

4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)

The final mark will be based on assignments and/or project

5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).

No

6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?

No

PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Bartosz Protas Email: bprotas@mcmaster.ca Extension: 2416 Date submitted: January 18, 2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012

McMaster University

SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM	Computational Science and Engineering			
COURSE TITLE	Parallel Programming			
COURSE NUMBER	CES #704	**COURSE CREDIT**		
		FULL COURSE ( )	**HALF COURSE (X)**	**QUARTER (MODULE) ( )**
INSTRUCTOR(S)				
PREREQUISITE(S)				

NATURE OF RECOMMENDATION ***(PLEASE CHECK APPROPRIATE BOX)***

NEW COURSE		**DATE TO BE OFFERED:** Fall 2013	**WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:**

WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? No **IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.**

CHANGE IN COURSE TITLE		**PROVIDE THE NEW COURSE TITLE:**				
CHANGE IN COURSE DESCRIPTION		**600-LEVEL COURSE** ***(Undergraduate course for graduate credit) Please see #4 on page 2 of this form***				
CHANGE TO FULL COURSE		**CHANGE TO HALF COURSE**		**CHANGE TO QUARTER COURSE**		
COURSE CANCELLATION	X	**PROVIDE THE REASON FOR COURSE CANCELLATION:** Replaced by a different course covering similar material in an integrated manner				
OTHER CHANGES		**EXPLAIN:**				

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description *(maximum 6 lines)* to be included in the Graduate Calendar.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)

The proposed course cancellation is a part broader changes concerning advanced computational courses offered in the School. Previously offered 6-week modules are replaced with two half-courses, an introductory and an advanced one, which will cover similar material in an integrated manner. Such delivery of the material will ensure that students will achieve a clearly-defined competence level by taking each of the courses. In the past the required material was scattered across several modules which students had to take and which also had some overlap. This change reflects recent trends in teaching high-performance and parallel computing

2. EXPECTED ENROLMENT:

3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):

4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)

5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).

6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?

PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Bartosz Protas Email: bprotas@mcmaster.ca Extension: 2416 Date submitted: January 18, 2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

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SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM	Computational Science and Engineering			
COURSE TITLE	Shared Memory Approaches to Parallel Applications			
COURSE NUMBER	CES #706	**COURSE CREDIT**		
		FULL COURSE ( )	**HALF COURSE (X)**	**QUARTER (MODULE) ( )**
INSTRUCTOR(S)				
PREREQUISITE(S)				

NATURE OF RECOMMENDATION ***(PLEASE CHECK APPROPRIATE BOX)***

NEW COURSE		**DATE TO BE OFFERED:** Fall 2013	**WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:**

WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? No **IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.**

CHANGE IN COURSE TITLE		**PROVIDE THE NEW COURSE TITLE:**				
CHANGE IN COURSE DESCRIPTION		**600-LEVEL COURSE** ***(Undergraduate course for graduate credit) Please see #4 on page 2 of this form***				
CHANGE TO FULL COURSE		**CHANGE TO HALF COURSE**		**CHANGE TO QUARTER COURSE**		
COURSE CANCELLATION	X	**PROVIDE THE REASON FOR COURSE CANCELLATION:** Replaced by a different course covering similar material in an integrated manner				
OTHER CHANGES		**EXPLAIN:**				

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description *(maximum 6 lines)* to be included in the Graduate Calendar.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)

The proposed course cancellation is a part broader changes concerning advanced computational courses offered in the School. Previously offered 6-week modules are replaced with two half-courses, an introductory and an advanced one, which will cover similar material in an integrated manner. Such delivery of the material will ensure that students will achieve a clearly-defined competence level by taking each of the courses. In the past the required material was scattered across several modules which students had to take and which also had some overlap. This change reflects recent trends in teaching high-performance and parallel computing

2. EXPECTED ENROLMENT:

3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):

4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)

5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).

6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?

PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Bartosz Protas Email: bprotas@mcmaster.ca Extension: 2416 Date submitted: January 18, 2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

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McMaster University

SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

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3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM	Computational Science and Engineering			
COURSE TITLE	Optimization of Numerically Intensive Codes			
COURSE NUMBER	CES #709	**COURSE CREDIT**		
		FULL COURSE ( )	**HALF COURSE (X)**	**QUARTER (MODULE) ( )**
INSTRUCTOR(S)				
PREREQUISITE(S)				

NATURE OF RECOMMENDATION ***(PLEASE CHECK APPROPRIATE BOX)***

NEW COURSE		**DATE TO BE OFFERED:** Fall 2013	**WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:**

WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? No **IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.**

CHANGE IN COURSE TITLE		**PROVIDE THE NEW COURSE TITLE:**				
CHANGE IN COURSE DESCRIPTION		**600-LEVEL COURSE** ***(Undergraduate course for graduate credit) Please see #4 on page 2 of this form***				
CHANGE TO FULL COURSE		**CHANGE TO HALF COURSE**		**CHANGE TO QUARTER COURSE**		
COURSE CANCELLATION	X	**PROVIDE THE REASON FOR COURSE CANCELLATION:** Replaced by a different course covering similar material in an integrated manner				
OTHER CHANGES		**EXPLAIN:**				

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description *(maximum 6 lines)* to be included in the Graduate Calendar.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)

The proposed course cancellation is a part broader changes concerning advanced computational courses offered in the School. Previously offered 6-week modules are replaced with two half-courses, an introductory and an advanced one, which will cover similar material in an integrated manner. Such delivery of the material will ensure that students will achieve a clearly-defined competence level by taking each of the courses. In the past the required material was scattered across several modules which students had to take and which also had some overlap. This change reflects recent trends in teaching high-performance and parallel computing

2. EXPECTED ENROLMENT:

3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):

4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)

5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).

6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?

PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Bartosz Protas Email: bprotas@mcmaster.ca Extension: 2416 Date submitted: January 18, 2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012

McMaster University

SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

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DEPARTMENT/PROGRAM	Computational Science and Engineering			
COURSE TITLE	The Message Passing Interface for Parallel Applications			
COURSE NUMBER	CES #713	**COURSE CREDIT**		
		FULL COURSE ( )	**HALF COURSE (X)**	**QUARTER (MODULE) ( )**
INSTRUCTOR(S)				
PREREQUISITE(S)				

NATURE OF RECOMMENDATION ***(PLEASE CHECK APPROPRIATE BOX)***

NEW COURSE		**DATE TO BE OFFERED:** Fall 2013	**WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:**

WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? No **IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.**

CHANGE IN COURSE TITLE		**PROVIDE THE NEW COURSE TITLE:**				
CHANGE IN COURSE DESCRIPTION		**600-LEVEL COURSE** ***(Undergraduate course for graduate credit) Please see #4 on page 2 of this form***				
CHANGE TO FULL COURSE		**CHANGE TO HALF COURSE**		**CHANGE TO QUARTER COURSE**		
COURSE CANCELLATION	X	**PROVIDE THE REASON FOR COURSE CANCELLATION:** Replaced by a different course covering similar material in an integrated manner				
OTHER CHANGES		**EXPLAIN:**				

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description *(maximum 6 lines)* to be included in the Graduate Calendar.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)

The proposed course cancellation is a part broader changes concerning advanced computational courses offered in the School. Previously offered 6-week modules are replaced with two half-courses, an introductory and an advanced one, which will cover similar material in an integrated manner. Such delivery of the material will ensure that students will achieve a clearly-defined competence level by taking each of the courses. In the past the required material was scattered across several modules which students had to take and which also had some overlap. This change reflects recent trends in teaching high-performance and parallel computing

2. EXPECTED ENROLMENT:

3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):

4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)

5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).

6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?

PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Bartosz Protas Email: bprotas@mcmaster.ca Extension: 2416 Date submitted: January 18, 2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012

McMaster University

SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

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1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
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3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM	Computational Science and Engineering			
COURSE TITLE	Parallel and High Performance Computing Systems			
COURSE NUMBER	CES #727	**COURSE CREDIT**		
		FULL COURSE ( )	**HALF COURSE (X)**	**QUARTER (MODULE) ( )**
INSTRUCTOR(S)				
PREREQUISITE(S)				

NATURE OF RECOMMENDATION ***(PLEASE CHECK APPROPRIATE BOX)***

NEW COURSE		**DATE TO BE OFFERED:** Fall 2013	**WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:**

WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? No **IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.**

CHANGE IN COURSE TITLE		**PROVIDE THE NEW COURSE TITLE:**				
CHANGE IN COURSE DESCRIPTION		**600-LEVEL COURSE** ***(Undergraduate course for graduate credit) Please see #4 on page 2 of this form***				
CHANGE TO FULL COURSE		**CHANGE TO HALF COURSE**		**CHANGE TO QUARTER COURSE**		
COURSE CANCELLATION	X	**PROVIDE THE REASON FOR COURSE CANCELLATION:** Replaced by a different course covering similar material in an integrated manner				
OTHER CHANGES		**EXPLAIN:**				

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description *(maximum 6 lines)* to be included in the Graduate Calendar.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)

The proposed course cancellation is a part broader changes concerning advanced computational courses offered in the School. Previously offered 6-week modules are replaced with two half-courses, an introductory and an advanced one, which will cover similar material in an integrated manner. Such delivery of the material will ensure that students will achieve a clearly-defined competence level by taking each of the courses. In the past the required material was scattered across several modules which students had to take and which also had some overlap. This change reflects recent trends in teaching high-performance and parallel computing

2. EXPECTED ENROLMENT:

3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):

4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)

5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).

6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?

PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Bartosz Protas Email: bprotas@mcmaster.ca Extension: 2416 Date submitted: January 18, 2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012

McMaster University

SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

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2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM	Earth Sciences			
COURSE TITLE	Advanced Hydrology			
COURSE NUMBER	ES 718	**COURSE CREDIT**		
		FULL COURSE ( )	**HALF COURSE ( )**	**QUARTER (MODULE) ( )**
INSTRUCTOR(S)	Sean K. Carey			
PREREQUISITE(S)				

NATURE OF RECOMMENDATION *(PLEASE CHECK APPROPRIATE BOX)*

NEW COURSE		**DATE TO BE OFFERED:**	**WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:**

WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.

CHANGE IN COURSE TITLE	X	**PROVIDE THE NEW COURSE TITLE:** Watershed Hydrology				
CHANGE IN COURSE DESCRIPTION	X	**600-LEVEL COURSE** ***(Undergraduate course for graduate credit) Please see #4 on page 2 of this form***				
CHANGE TO FULL COURSE		**CHANGE TO HALF COURSE**		**CHANGE TO QUARTER COURSE**		
COURSE CANCELLATION		**PROVIDE THE REASON FOR COURSE CANCELLATION:**				
OTHER CHANGES		**EXPLAIN:**				

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description *(maximum 6 lines)* to be included in the Graduate Calendar.

This course will examine the fundamentals of watershed hydrology including precipitation, evapotranspiration, snowmelt, soil water,runoff and surface-groundwater interactions. The course will involve lectures, field-based exercises and computer modelling.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

Hydrology is an interdisciplinary science concerned with the occurrence and movement of water on earth. As water is our most critical resource, hydrology is important as both a science and engineering discipline. In this course, aspects of hydrological science will be presented in a unified framework with an emphasis on atmospheric and surface hydrological processes. Earth's energy budget, radiative transfer, atmospheric moisture dynamics, precipitation, evaporation, infiltration and soil water physics, snow hydrology, and runoff generation will be covered. There is no specific text. A reading list is attached.

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)

This course is a foundation course for graduate studetns in the hydrology stream in SGES. It is meant to provide all incoming graduate students and advanced knowledge of catchment hydrology. It eliminates overlap with other courses in the graduate program.

2. EXPECTED ENROLMENT:

6-12

3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):

The class mixes formal lectures with paper discussion, modelling exercise and hands-on instrumentation work. A three hour time slot is requested once per week.

4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the Extra Work to be required of graduate students, i.e., exams, essays, etc.)

5 assignments (50%)
Term Project (30%)
Participation and Presentations (20%)

5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).

No

6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?

This course is meant primarily meant for graduate students in the School of Geography and Earth Sciences

PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Sean Carey Email: careysk@mcmaster.ca Extension: 20134 Date: 23 Nov 2012

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2011

Recomended Text:
Physical Hydrology (2/e). 2002. S.L. Dingman, Prentice Hall, 646 pp.

Weekly Assigned Journal Articles:

Week 1: Hydrology and the Water Cycle
P. S. Eagleson. Hydrologic Science - A Distinct Geoscience. *Reviews of Geophysics* 29 (2):237-248, 1991.
M. T. Chahine. The Hydrological Cycle and Its Influence on Climate. *Nature* 359 (6394):373-380, 1992.
K. Beven. The limits of splitting: Hydrology. *Science of the Total Environment* 183 (1-2):89-97, 1996.
B. Sivakumar. Chaos theory in hydrology: important issues and interpretations. *Journal of Hydrology* 227 (1-4):1-20, 2000.

Week 2: Energy
P. M. Lafleur and W. R. Rouse. The Influence of Surface Cover and Climate on Energy Partitioning and Evaporation in A Subarctic Wetland. *Boundary-Layer Meteorology* 44 (4):327-347, 1988.
R. M. Petrone and W. R. Rouse. Synoptic controls on the surface energy and water budgets in sub-arctic regions of Canada. *International Journal of Climatology* 20 (10):1149-1165, 2000.

Week 3: Evaporation
P. A. Bartlett, J. H. McCaughey, P. M. Lafleur, and D. L. Verseghy. Modelling evapotranspiration at three boreal forest stands using the class: Tests of parameterizations for canopy conductance and soil evaporation. *International Journal of Climatology* 23 (4):427-451, 2003.
P. D. Blanken, W. R. Rouse, A. D. Culf, C. Spence, L. D. Boudreau, J. N. Jasper, B. Kochtubajda, W. M. Schertzer, P. Marsh, and D. Verseghy. Eddy covariance measurements of evaporation from Great Slave Lake, Northwest Territories, Canada. *Water Resources Research* 36 (4):1069-1077, 2000.

Week 4: Rainfall
J. Benning and D. Q. Yang. Adjustment of daily precipitation data at Barrow and Nome Alaska for 1995-2001. *Arctic Antarctic and Alpine Research* 37 (3):276-283, 2005.
J. D. Creutin and C. Obled. Objective Analyses and Mapping Techniques for Rainfall Fields - An Objective Comparison. *Water Resources Research* 18 (2):413-431, 1982.

Week 5: Snow
P. Marsh and M. K. Woo. Meltwater Movement in Natural Heterogeneous Snow Covers. *Water Resources Research* 21 (11):1710-1716, 1985.
J. W. Pomeroy, B. Toth, R. J. Granger, N. R. Hedstrom, and R. L. H. Essery. Variation in surface energetics during snowmelt in a subarctic mountain catchment. *Journal of Hydrometeorology* 4 (4):702-719, 2003.

Week 6: Interception

N. R. Hedstrom and J. W. Pomeroy. Measurements and modelling of snow interception in the boreal forest. *Hydrological Processes* 12 (10-11):1611-1625, 1998.

C. R. Lloyd, J. H. C. Gash, W. J. Shuttleworth, and A. D. Marques. The Measurement and Modeling of Rainfall Interception by Amazonian Rain-Forest. *Agricultural and Forest Meteorology* 43 (3-4):277-294, 1988.

Weeks 7 and 8: Infiltration and Soil Physics

B. Si, R. G. Kachanoski, F. Zhang, G. W. Parkin, and D. E. Elrick. Measurement of hydraulic properties during constant flux infiltration: Field average. *Soil Science Society of America Journal* 63 (4):793-799, 1999.

M. Weiler and F. Naef. Simulating surface and subsurface initiation of macropore flow. *Journal of Hydrology* 273 (1-4):139-154, 2003.

D. M. Gray, B. Toth, L. T. Zhao, J. W. Pomeroy, and R. J. Granger. Estimating areal snowmelt infiltration into frozen soils. *Hydrological Processes* 15 (16):3095-3111, 2001.

K. Beven and P. Germann. Macropores and Water-Flow in Soils. *Water Resources Research* 18 (5):1311-1325, 1982.

Week 8: Wetlands

M. Hayashi, W. L. Quinton, A. Pietroniro, and J. J. Gibson. Hydrologic functions of wetlands in a discontinuous permafrost basin indicated by isotopic and chemical signatures. *Journal of Hydrology* 296 (1-4):81-97, 2004.

J. S. Price and M. K. Woo. Studies of A Subarctic Coastal Marsh .1. Hydrology. *Journal of Hydrology* 103 (3-4):275-292, 1988.

W. L. Quinton, M. Hayashi, and A. Pietroniro. Connectivity and storage functions of channel fens and flat bogs in northern basins. *Hydrological Processes* 17 (18):3665-3684, 2003.

Weeks 9 and 10 Runoff

D. R. Montgomery and W. E. Dietrich. Runoff generation in a steep, soil-mantled landscape. *Water Resources Research* 38 (9), 2002.

P. Reggiani, M. Sivapalan, and S. M. Hassanizadeh. Conservation equations governing hillslope responses: Exploring the physical basis of water balance. *Water Resources Research* 36 (7):1845-1863, 2000.

J. S. Robinson, M. Sivapalan, and J. D. Snell. On the relative roles of hillslope processes, channel routing, and network geomorphology in the hydrologic response of natural catchments. *Water Resources Research* 31 (12):3089-3101, 1995.

S. L. Schiff, K. J. Devito, R. J. Elgood, P. M. McCrindle, J. Spoelstra, and P. Dillon. Two adjacent forested catchments: Dramatically different NO3- export. *Water Resources Research* 38 (12), 2002.

S. K. Carey and M. K. Woo. Slope runoff processes and flow generation in a subarctic, subalpine catchment. *Journal of Hydrology* 253 (1-4):110-129, 2001.

Weeks 11 and 12: Runoff Modelling

M. Weiler and J. McDonnell. Virtual experiments: a new approach for improving process conceptualization in hillslope hydrology. *Journal of Hydrology* 285 (1-4):3-18, 2004.

K. Beven and J. Freer. A Dynamic Topmodel. *Hydrological Processes* 15 (10):1993-2011, 2001.

D. Cameron, K. Beven, and J. Tawn. Modelling extreme rainfalls using a modified random pulse Bartlett-Lewis stochastic rainfall model (with uncertainty). *Advances in Water Resources* 24 (2):203-211, 2000.

R. A. Woods, M. Sivapalan, and J. S. Robinson. Modeling the spatial variability of subsurface runoff using a topographic index. *Water Resources Research* 33 (5):1061-1073, 1997.

McMaster University

SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM	School of Geography and Earth Sciences			
COURSE TITLE	Geographies of Health			
COURSE NUMBER	736	**COURSE CREDIT**		
		FULL COURSE ( )	**HALF COURSE (X)**	**QUARTER (MODULE) ( )**
INSTRUCTOR(S)	John Eyles			
PREREQUISITE(S)	Permission of the instructor.			

NATURE OF RECOMMENDATION ***(PLEASE CHECK APPROPRIATE BOX)***

NEW COURSE		**DATE TO BE OFFERED:**	**WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:**

WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.

CHANGE IN COURSE TITLE		**PROVIDE THE CURRENT COURSE TITLE:**				
CHANGE IN COURSE DESCRIPTION	x	**600-LEVEL COURSE** ***(Undergraduate course for graduate credit)*** ***Please see #4 on page 2 of this form***				
CHANGE TO FULL COURSE		**CHANGE TO HALF COURSE**		**CHANGE TO QUARTER COURSE**		
COURSE CANCELLATION		**PROVIDE THE REASON FOR COURSE CANCELLATION:**				
OTHER	X	**EXPLAIN:** Change in calendar description; content/rationale; statement of purpose.				

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description *(maximum 6 lines)* to be included in the Graduate Calendar.

This course examines the role of meanings, models, measurement and evidence for selected content areas concerning environments, life style and structural and contextual factors.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

This course now examines key dimensions in determining the strength of evidence in qualitative, quantitative and mixed method approaches in the follwing sub-topics: the meanings of health and well-being, models used in health research, measurement and operationalization issues, the role of evidence, and a series of case studies, depending on class list. Readings are largely from current journal articles.

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)

This is an existing course which serves the needs of graduate students working in the area of medical geography and health research.

2. EXPECTED ENROLMENT:

8 students (both HRM and Geography)

3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):

It will consist of weekly meetings to discuss readings.

4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION: (For 600-level course, indicate the Extra Work to be required of graduate students, i.e., exams, essays, etc.)

Assessment will consist of two essays, one on bases of evidence , the other on substantive issues and policy. Participation in all classes is mandatory. Every week a member of class will take the lead on being the discussant on the readings.

5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).

No

6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?

Course is cross-listed with HRM *735

PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: John Eyles Email: eyles@mcmaster.ca Extension: 23152

If you have any questions regarding this form, please contact the Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/December 2006

McMaster University

SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM	KINESIOLOGY			
COURSE TITLE	Cognitive Dysfunction and Perceptual Motor Performance			
COURSE NUMBER	707	**COURSE CREDIT**		
		FULL COURSE ( )	**HALF COURSE (X)**	**QUARTER (MODULE) ( )**
INSTRUCTOR(S)	D. Elliot			
PREREQUISITE(S)	n/a			

NATURE OF RECOMMENDATION ***(PLEASE CHECK APPROPRIATE BOX)***

NEW COURSE		**DATE TO BE OFFERED:**	**WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:**

WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.

CHANGE IN COURSE TITLE		**PROVIDE THE NEW COURSE TITLE:**				
CHANGE IN COURSE DESCRIPTION		**600-LEVEL COURSE** ***(Undergraduate course for graduate credit) Please see #4 on page 2 of this form***				
CHANGE TO FULL COURSE		**CHANGE TO HALF COURSE**		**CHANGE TO QUARTER COURSE**		
COURSE CANCELLATION	X	**PROVIDE THE REASON FOR COURSE CANCELLATION:** instructor is retired, No faculty were hired to replace instructor; no one in dept has expertise to teach subject.				
OTHER CHANGES		**EXPLAIN:**				

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description *(maximum 6 lines)* to be included in the Graduate Calendar.
n/a

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.
N/a

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)

It no longer does

2. EXPECTED ENROLMENT:

none since 1996-97 academic year

3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):

n/a

4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)

n/a

5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).

n/a

6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?

n/a

PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: R Clifford Email: kingrad Extension: 23582 Date submitted: November 2012

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012

McMaster University

SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING DEGREE PROGRAM REQUIREMENTS / PROCEDURES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** changes involving degree program requirements/procedures. **All** sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT	Mathematics and Statistics
NAME OF PROGRAM	PhD-program in Mathematics

PROGRAM DEGREE	**Ph.D. (x)**	**M.A. ( )**	**M.A.Sc. ( )**	**M.B.A. ( )**	**M. Eng. ( )**	**M.Sc. ( )**	**Diploma Program ( )**	**Other *(Specify)***

NATURE OF RECOMMENDATION *(PLEASE CHECK APPROPRIATE BOX)*

CHANGE IN ADMISSION REQUIREMENTS		**CHANGE IN COMPREHENSIVE EXAMINATION PROCEDURE**	x	**CHANGE IN COURSE REQUIREMENTS**	
CHANGE IN THE DESCRIPTION OF A SECTION IN THE GRADUATE CALENDAR		**EXPLAIN:**			
OTHER CHANGES		**EXPLAIN:**			

DESCRIBE THE EXISTING REQUIREMENT/PROCEDURE:

All candidates are required to pass the comprehensive exam consisting of two exams testing breadth of knowledge (the first written and the second written or oral, at the department's discretion), and one additional oral exam testing depth of knowledge in the proposed field of study. Candidates must also present and defend, in an oral examination, a thesis written under the supervision of a faculty member containing original research.

PROVIDE A DETAILED DESCRIPTION OF THE RECOMMENDED CHANGE *(Attach additional pages if space is not sufficient.)*

The Department recommends to cancel the second written comprehensive exam, so that the new comprehensive exam will consist of a written exam testing breadth of knowledge and an oral exam testing depth of knowledge in the proposed field of study.

RATIONALE FOR THE RECOMMENDED CHANGE:

The Department felt that the Comprehensive exam in its current form is "overtesting`` the students by asking them to pass two written and one oral exam, before they can concentrate on their thesis. Most Departments in the Faculty of Science at McMaster and other Mathematics Departments in Canada require only an oral exam.
In the past the students would take these exams at the beginning of the PhD-program. To reduce the failure rate in the first year of the PhD-program most students -- in particular Visa students -- now have to pass the first written exam, before they are can be admitted to the PhD-program. The material for the second exam is covered in the basic Graduate courses. If the second exam is cancelled , then knowledge of this material can still be tested either within these courses or as part of the oral exam. Elimination of the second exam allows the students to pass the Comprehensive exam earlier, and therefore has a positive effect on the Department's efforts to have all PhD-students finish within 4 years.

PROVIDE IMPLEMENTATION DATE: ***(Implementation date should be at the beginning of the academic year)***

Jan. 2013

ARE THERE ANY OTHER DETAILS OF THE RECOMMENDED CHANGE THAT THE CURRICULUM AND POLICY COMMITTEE SHOULD BE AWARE OF? IF YES, EXPLAIN.

PROVIDE A DESCRIPTION OF THE RECOMMENDED CHANGE TO BE INCLUDED IN THE CALENDAR:

Change the following part of the sentence

"All candidates are required to pass the comprehensive exam consisting of two exams testing breadth of knowledge (the first written and the second written or oral, at the department's discretion), and one …..``

in the PhD Degree section (page 442) to

" All candidates are required to pass the comprehensive exam consisting of a written exam testing breadth of knowledge, and one….``

CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Manfred Kolster Email: kolster@mcmaster.ca Extension: 27243 Date submitted: Jan. 17, 2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012

McMaster University

SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM	Master's program Mathematics			
COURSE TITLE	Industrial Project			
COURSE NUMBER	797	**COURSE CREDIT**		
		FULL COURSE ( )	**HALF COURSE (x)**	**QUARTER (MODULE) ( )**
INSTRUCTOR(S)	Director of the M-Phimac program			
PREREQUISITE(S)				

NATURE OF RECOMMENDATION ***(PLEASE CHECK APPROPRIATE BOX)***

NEW COURSE	x	**DATE TO BE OFFERED:** May 1, 2013	**WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:**

WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.

CHANGE IN COURSE TITLE		**PROVIDE THE NEW COURSE TITLE:**				
CHANGE IN COURSE DESCRIPTION		**600-LEVEL COURSE** ***(Undergraduate course for graduate credit) Please see #4 on page 2 of this form***				
CHANGE TO FULL COURSE		**CHANGE TO HALF COURSE**		**CHANGE TO QUARTER COURSE**		
COURSE CANCELLATION		**PROVIDE THE REASON FOR COURSE CANCELLATION:**				
OTHER CHANGES		**EXPLAIN:**				

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description *(maximum 6 lines)* to be included in the Graduate Calendar.

Students in the M-PhiMac Program work on a summer industrial project.
This will explore a topic of current interest with guidance from an industry professional and can be completed while working full time or as an intern.This course is required for fulfillment of the M-PhiMac Program.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

Topics from the areas of risk management, derivative securities analysis and portfolio design.

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)

To complete the M-PhiMac program students have to complete 8 Graduate courses in Financial Mathematics and Statistics and work on a summer industrial project. This mandatory industrial project is the content of the new course 797.

2. EXPECTED ENROLMENT:

20

3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):

Individual instruction on the project through the supervisor.

4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)

Evaluation of practical work, written report and presentation. Emphasis on written report (about 70%) and presentation (about 30%).

5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).

No

6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?

Course is only accessible to students in the M-PhiMac program.

PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: M. Kolster Email: kolster@mcmaster.ca Extension: 27243 Date submitted: Jan. 17, 2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012

McMaster University

SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM	STATISTICS			
COURSE TITLE	Statistical Modelling in Practice			
COURSE NUMBER	6K03	**COURSE CREDIT**		
		FULL COURSE ( )	**HALF COURSE (x)**	**QUARTER (MODULE) ( )**
INSTRUCTOR(S)	Stats group			
PREREQUISITE(S)	Open to Financial Mathematics Students			

NATURE OF RECOMMENDATION ***(PLEASE CHECK APPROPRIATE BOX)***

NEW COURSE		**DATE TO BE OFFERED:**	**WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:**			
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.						
CHANGE IN COURSE TITLE		**PROVIDE THE NEW COURSE TITLE:**				
CHANGE IN COURSE DESCRIPTION	x	**600-LEVEL COURSE** ***(Undergraduate course for graduate credit) Please see #4 on page 2 of this form***	x			
CHANGE TO FULL COURSE		**CHANGE TO HALF COURSE**		**CHANGE TO QUARTER COURSE**		
COURSE CANCELLATION		**PROVIDE THE REASON FOR COURSE CANCELLATION:**				
OTHER CHANGES	x	**EXPLAIN:** The Stats course 721 is taken mainly by students in the M-PhiMac program. The level is considered to be comparable to other Stats 600-level courses, so that a change of the course number to *6K03 seems appropriate.				

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description *(maximum 6 lines)* to be included in the Graduate Calendar.

Same as currently

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

Same as currently

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)

The Stats course 6K3 will be taken by students in the M-PhiMac program. It is intended to cross-list this course in the future with the course MFIN 604 offered by the Faculty of Business.

2. EXPECTED ENROLMENT:

20

3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):

as before

4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)

as before

5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).

It is planned to be cross-listed with MFIN 604 offered by the Faculty of Business.

6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?

PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: M. Kolster Email: kolster@mcmaster.ca Extension: 27243 Date submitted: Jan 30, 2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012

McMaster University

SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM	Medical Physics and Applied Radiation Sciences			
COURSE TITLE	Medical Health Physics			
COURSE NUMBER	772	**COURSE CREDIT**		
		FULL COURSE (x)	**HALF COURSE ( )**	**QUARTER (MODULE) ( )**
INSTRUCTOR(S)	Kevin Diamond			
PREREQUISITE(S)				

NATURE OF RECOMMENDATION ***(PLEASE CHECK APPROPRIATE BOX)***

NEW COURSE		**DATE TO BE OFFERED:**	**WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:**

WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.

CHANGE IN COURSE TITLE	x	**PROVIDE THE NEW COURSE TITLE:** Health Physics of Non-Ionizing Radiation				
CHANGE IN COURSE DESCRIPTION	x	**600-LEVEL COURSE** ***(Undergraduate course for graduate credit) Please see #4 on page 2 of this form***				
CHANGE TO FULL COURSE		**CHANGE TO HALF COURSE**		**CHANGE TO QUARTER COURSE**		
COURSE CANCELLATION		**PROVIDE THE REASON FOR COURSE CANCELLATION:**				
OTHER CHANGES		**EXPLAIN:**				

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description *(maximum 6 lines)* to be included in the Graduate Calendar.

This course introduces students to the Health Physics aspects of non-ionizing forms of radiation commonly used in medicine, including ultraviolet, optical, and radiofrequency/microwave.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)
2. EXPECTED ENROLMENT:
3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):
4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)
5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).
6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?
PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE: Name: Tom Farrell Email: tfarrell@mcmaster.ca Extension: 21509 Date submitted: Jan 16, 2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012

McMaster University

SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM	Physics			
COURSE TITLE	Introduction to Molecular Biophysics			
COURSE NUMBER	Physics 6S03	**COURSE CREDIT**		
		FULL COURSE ( )	**HALF COURSE (x)**	**QUARTER (MODULE) ( )**
INSTRUCTOR(S)	P Higgs			
PREREQUISITE(S)				

NATURE OF RECOMMENDATION ***(PLEASE CHECK APPROPRIATE BOX)***

NEW COURSE		**DATE TO BE OFFERED:**	**WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:**

WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.

CHANGE IN COURSE TITLE	X	**PROVIDE THE NEW COURSE TITLE:** BIOPHYSICS				
CHANGE IN COURSE DESCRIPTION		**600-LEVEL COURSE** ***(Undergraduate course for graduate credit) Please see #4 on page 2 of this form***	x			
CHANGE TO FULL COURSE		**CHANGE TO HALF COURSE**		**CHANGE TO QUARTER COURSE**		
COURSE CANCELLATION		**PROVIDE THE REASON FOR COURSE CANCELLATION:**				
OTHER CHANGES	x	**EXPLAIN:** The undergraduate course on which this graduate course is based has changed its name to Biophysics 4S03 (formerly Physics 4S03) as there is now an honours Biophysics program. This needs to be clarified in order that the room assignment and on-line grade submission process will work properly. The primary course title is now Biophysics 4S03, and the graduate versions Physics *6S03 and Biochemistry *6S03 are both linked to this. There are no changes to course content and assessment methods.				

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description *(maximum 6 lines)* to be included in the Graduate Calendar.
Unchanged

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.
Unchanged

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)

Unchanged

2. EXPECTED ENROLMENT:

Unchanged

3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):

Unchanged

4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)

Unchanged

5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).

Unchanged

6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?

Unchanged

PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Paul Higgs Email: higgsp Extension: 26870 Date submitted: 1/17/2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012

Calendar copy

Astrobiology

The Origins Institute in collaboration with five "home" departments offers Canada's first graduate program in Astrobiology. The "Collaborative Graduate Program in Astrobiology" offers students an M.Sc. or Ph.D. in the rapidly emerging interdisciplinary science of Astrobiology. Students must be accepted to do graduate studies in any of five participating home departments: Biochemistry and Biomedical Sciences, Biology, Chemistry and Chemical Biology, Physics and Astronomy, and the School of Geography and Earth Sciences. Astrobiology is an intrinsically interdisciplinary, or perhaps more appropriately 'transdisciplinary,' science. Researchers must possess expertise in specific fields such as astrophysics, microbiology, planetary sciences, biochemistry and chemistry, etc. but also must have the training that allows them to work effectively within multidisciplinary teams. Our graduate program provides this kind of training and research opportunities.

A candidate will register for the M.Sc. or Ph.D. degree in any of the participating five departments and, in addition to the special regulations summarized below, will be subject to the general regulations and course/thesis requirements that govern graduate work in the department in which he/she is registered. As part of their application process, they must also provide a written (online) statement describing their interests in astrobiology and the research that they would be interested in pursuing.

The Astrobiology portion is carried out by the OI in close collaboration with these departments. Some course work and research seminars in astrobiology (see below), as well as Astrobiological research and thesis, lie at the heart of the program. Successful completion of the program will provide students an 'Astrobiology Specialization' to complement their *home* degree, and graduates will be qualified to pursue further research and work in the field.

The core faculty members in the program supervise the Astrobiological graduate research and also teach the graduate courses in the program. They are Profs. R. Gupta, Y-F Li, G. Wright (Biochemistry); J. Stone, J.P. Xu, and B. Golding (Biology); P. Harrison (Chemistry); P. Higgs, R.E. Pudritz, M. Rheinstadter, and J. Wadsley (Physics and Astronoy); and C. Eyles, G. Slater, and L. Warren (Earth Sciences).

Required courses are defined according to prescriptions for each home program. Additionally, M.Sc. students are required to take a one term, ORIGINS *701 Survey of Astrobiology course and the bimonthly ORIGINS *705 Astrobiology Research Seminar and Journal Club course. Doctoral students are required to complete (one term) course work from outside their research area, from the Astrobiology course list as well as the ORIGINS *705. With supervisory committee permission, the courses below and entries in the Astrobiology course list could count toward requirements for a home program. All students are required to attend the Origins Institute Colloquium series. This is an important resource for students, as they will have the opportunity to interact directly with distinguished leaders and scientists in the field. Doctoral students must complete a Comprehensive exam that is administered by their home department.

Courses

***701 / Survey of Astrobiology**
A current survey of the three major aspects of Astrobiology and the Origins of Life: astrophysics and planetary science, geochemistry and geology, and molecular biology and biochemistry. The course introduces student to the major questions and results of Astrobiology, and develops interdisciplinary approaches towards their solution.

***705 / Astrobiology Research Seminar and Journal Club**

This course provides a research seminar and journal club format for exploring important topics and results in the Astrobiological literature as well as research being done by the students and faculty members in the program. The week to week scheduling of events will be managed by a pair of graduate students in the program in consultation with a faculty coordinator. The course will also feature interaction with distinguished visiting scientists and OI colloquium speakers in Astrobiology.

McMaster University

SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for ALL course changes. All sections of this form must be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM	Origins Institute			
COURSE TITLE	Survey of Astrobiology			
COURSE NUMBER	Origins 701	COURSE CREDIT		
		FULL COURSE ( )	HALF COURSE (X)	QUARTER (MODULE) ( )
INSTRUCTOR(S)	Jonathon Stone, Ralph Pudritz, + 4 Guest Lecturers.			
PREREQUISITE(S)				

NATURE OF RECOMMENDATION *(PLEASE CHECK APPROPRIATE BOX)*

NEW COURSE	X	DATE TO BE OFFERED: Jan. 2013	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? PENDING IF YES, PROVIDE THE DATE:

WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.

CHANGE IN COURSE TITLE		PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE *(Undergraduate course for graduate credit) Please see #4 on page 2 of this form*		
CHANGE TO FULL COURSE		CHANGE TO HALF COURSE		CHANGE TO QUARTER COURSE
COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:		
OTHER CHANGES		EXPLAIN:		

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description *(maximum 6 lines)* to be included in the Graduate Calendar.

A current survey of the three major aspects of Astrobiology and the Origins of Life: astrophysics and planetary science, geochemisty and geology, and molecular biology and biochemistry. The course introduces students to the major questions and results of Astrobiology, and develops interdisciplinary approaches towards their solution.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

Topics include; characterization of terrestrial planets in the solar system and exoplanets, planetary habitability, formation of terrestrial planets, search for life in the solar system; early evolution of the Earth and Mars, analogue sites for extreme life, mineral and isotopic record for evolution of life on Earth with application to Mars; and biomolecules and early cells, extreme ecosystems origins of life, RNA world, phylogenomics and the evolution of life on Earth.

SCHOOL OF GRADUATE STUDIES RECEIVED DEC 12 2012

DEANS' APPROVAL

Graduate Studies — Date: Dec 4, 2012

Faculty — Date: DEC 10 2012

Please return to the School of Graduate Studies

1. **STATEMENT OF PURPOSE (How does the course fit into the department's program?)**

This course provides a necessary overview of the rapidly expanding field of Astrobiology. It will allow students from a variety of backgrounds (from astrophysics to geochemistry to biology) to come up to the same level in knowledge and understanding of the field. For many, this will be the first time that they experience Astrobiology in a formal setting. Of special importance will be the need to foster interdisciplinary thinking in the students – which begins with a careful exposure to the field's main ideas, basic scientific results, and a common Astrobiological "language".

2. **EXPECTED ENROLMENT:**

For students registered in the program, our initial target is to train 5 new graduate students per year -- for a steady state of 25 – 30 students pursuing M.Sc. and Ph.D. degrees.

3. **DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):**

The course will involve lectures from members of the OI faculty, reading fundamental Astrobiology papers – one of which will be presented each week by a graduate student in the class (each student also will be responsible for a term research paper, presentation, and 2 assignments).

4. **DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)**

Typically 25% for the review presentation, 35% for the assignments, and 40% for the term paper and presentation.

5. **TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).**

This is the first and only course of its kind at McMaster University. Given that this is the first graduate program in Astrobiology in Canada, it is also likely to be a first in the graduate programs of any Canadian University.

6. **IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?**

This is an interdisciplinary course given by the Origins Institute. It benefits students from a variety of "home programs". All of the 5 participating departments are well apprised of the goals and methods of the program and its courses, and have given their written support for it.

PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Ralph E. Pudritz Email: pudritz@mcmaster.ca Extension:23180 Date submitted: Dec. 4, 2012

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012

McMaster University

SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM	Origins Institute			
COURSE TITLE	Astrobiology Research Seminar and Journal Club			
COURSE NUMBER	Origins 705	**COURSE CREDIT**		
		FULL COURSE ( )	**HALF COURSE** (X)	**QUARTER (MODULE)** ( )
INSTRUCTOR(S)	TBA			
PREREQUISITE(S)				

NATURE OF RECOMMENDATION *(PLEASE CHECK APPROPRIATE BOX)*

NEW COURSE	X	DATE TO BE OFFERED: Jan. 2013	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? PENDING IF YES, PROVIDE THE DATE:

WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.

CHANGE IN COURSE TITLE		PROVIDE THE NEW COURSE TITLE:			
CHANGE IN COURSE DESCRIPTION		**600-LEVEL COURSE** *(Undergraduate course for graduate credit) Please see #4 on page 2 of this form*			
CHANGE TO FULL COURSE		**CHANGE TO HALF COURSE**		**CHANGE TO QUARTER COURSE**	
COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:			
OTHER CHANGES		EXPLAIN:			

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description *(maximum 6 lines)* to be included in the Graduate Calendar.

This course provides a research seminar and journal club format for exploring important topics and results in the Astrobiological literature as well as research being done by the students and faculty members in the program. The week to week scheduling of events will be managed by a pair of graduate students in the program in consultation with a faculty coordinator. The course will also feature interaction with distinguished visiting scientists and OI colloquium speakers in Astrobiology.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

The course will loosely follow the range of three major scientific areas in Astrobiology developed in the Origins 701 course – Survey of Astrobiology – but will not be limited to those. Students can expect to make one presentation per term on a paper or their research. Students will take both terms of this biweekly course throughout their M.Sc. and / or Ph.D. programs. It will provide a long term "glue" that is necessary to connect students and faculty in the program into a true interdisciplinary environment.

1. **STATEMENT OF PURPOSE (How does the course fit into the department's program?)**

This research seminar/journal club provides the necessary ongoing exposure, discussion, and involvement in the latest results Astrobiology. The course will allow students from a variety of backgrounds (from astrophysics to geochemistry to biology) to acclimatize to this broad field and to develop an ability to communicate their research results to researchers from outside of their area of concentration. Of special importance will be the need to foster interdisciplinary thinking in the students – and thereby build a true Astrobiology "cohort" with which they can identify both scientifically and culturally. Finally, the students will gain invaluable exposure to national and international leaders in the field – who are regularly scheduled to give OI colloquia. This experience will provide them with many additional opportunities for professional development.

2. **EXPECTED ENROLMENT:**

For students registered in the program, our initial target is to train 5 new graduate students per year – for a steady state of 25 – 30 students pursuing M.Sc. and Ph.D. degrees. This course will ultimately therefore have up to 30 graduate students per year once the program is fully deployed (after about 5-6 years).

3. **DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):**

Students will present and lead the discussion of a paper in the current Astrobiology research literature once per term, as well as give a presentation on their research in a second term. The emphasis is on extensive discussion in the seminar/journal club format. Each biweekly meeting will take up no more than one hour. Faculty and postdocs will also participate in the seminar.

4. **DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)**

Students will be marked on a pass/fail basis – largely dependent upon their participation and on having presented results of their research.

5. **TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).**

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PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Ralph E. Pudritz Email: pudritz@mcmaster.ca Extension:23180 Date submitted: Dec. 4, 2012

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012

DEANS' APPROVAL

Graduate Studies — Date: Dec 4 2012

Faculty — Date: DEC 10 2012

Please return to the School of Graduate Studies