McMaster University

School of Graduate Studies

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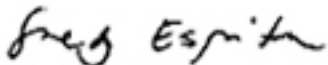L8S 4M2

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April 16, 2010

To   :   Members of the Faculty of Business Graduate Curriculum and
                    Policy Committee

From   :   Medy Espiritu
                    Assistant Secretary & SynApps System Administrator

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The next meeting of the Faculty of Business Graduate Curriculum and Policy Committee will be held on **Monday, April 26, 2010** at **3:00 p.m.** in **DSB-510**.

<u>Agenda</u>:

1)   New interdisciplinary program:
                    Master of Technology Entrepreneurship and Innovation Degree

2)   Calendar copy: Master of Health Management program

McMaster University

**Brief for the Appraisal
of the**

Master of Technology Entrepreneurship and Innovation Degree

**Submitted to the
Ontario Council on Graduate Studies
March 2010**

VOLUME I: The Program

THE TECHNOLOGY ENTREPRENEURSHIP AND INNOVATION PROGRAM

Appendices
    A. 2009/2010 Postgraduate Course Handbook for the MEEI program
    B. Business Plan Competitions and tradeshows attended by students
    C. Statement from the Chief Librarian
    D. Detailed description of the Entrepreneurship & Innovation modules
    E. Applicant Evaluation Form

1. INTRODUCTION

1.1. Brief listing of program

The Technology Entrepreneurship and Innovation (TEI) program offered by the Faculty of Engineering at McMaster University will lead to a Master of Technology Entrepreneurship and Innovation (MTEI) degree.

This program, as detailed in this brief, has a degree structure and curriculum which is nearly identical to that of the MEEI (Master of Engineering Entrepreneurship and Innovation) degree that is currently offered by McMaster.   However, the proposed MTEI degree in Technology Entrepreneurship and Innovation is targeted specifically towards potential students who do not have undergraduate degrees in engineering or science. The emphasis is for students in this program to participate in teams, together with MEEI students, working on technology-based entrepreneurship projects which require a multi-disciplinary approach. For reference purposes, Appendix A includes the 2009/2010 Postgraduate Course Handbook for the MEEI program.

The MTEI degree candidates will learn from renowned experts:

- *How to recognize business opportunities that are technology-based,*

- *How to create sustainable competitive advantage for new business entities,*

- *How to use proven methods for developing technology based business, and acquiring entrepreneurial skills to take the innovative technology to market.*

1.2. Objectives of the program

The program aims to produce entrepreneurial professionals who operate in the business and commercialization sector and who recognize the importance of innovation and the role of technology in the development of business enterprises. This program is aimed at people who intend to start new businesses or play a leading role in an innovative unit of an established organization. The core of the program provides the theoretical and practical skills required to produce a comprehensive business plan, integrating marketing, sales, organizational behaviour and financial planning within a sound competitive strategy for innovative ideas. This program provides professional capabilities not only to potential entrepreneurs, but also to entrepreneurial professionals and managers in established organizations.   While program participants are not expected to have any specific background in engineering or science, it is expected that they will develop sufficient understanding of the role of technology to ensure that technological aspects are fully incorporated in developing a new business, service or product.

Student Learning and Outcome Expectations

On completion of their program of study, students will:
- have the ability to identify markets for new knowledge, and
- have the tools to exploit those markets through creation of new products, services or processes.

Moreover they will be capable of:

- *seeking out*, *understanding* and *keeping up to date* with the most recent advances in their discipline and technologies used in that field.
- *identifying* and *researching* markets, drawing up and implementing commercial plans to target these markets effectively,
- *compiling* and *presenting* business reports and plans,
- *effectively setting* and *achieving* goals through team work,
- *building* networks of support in expert and commercial communities,
- *raising and managing* funds in support of their ventures,
- *launching* start-ups.

Students will also have developed:

- An ability to plan and execute a substantial piece of independent research and/or development in a specialized field,
- Knowledge and understanding of the business founding, development and knowledge transfer processes,
- Knowledge and understanding of business and sales management, and business growth and development,
- Generic transferable skills in intellectual property protection, leadership, team building, negotiation, networking and business process innovation.

The above objectives are achieved through a program structure which is essentially the same as that of the existing MEEI (Master of Engineering in Entrepreneurship and Innovation) program. The key elements of that structure are:

a. Five Entrepreneurship and Innovation Modules which have been designed to facilitate student learning about enterprise creation and associated management processes. This knowledge is transferred into capability through a series of accompanying interactive workshops that take the student through an entrepreneur's skill-set, know-how for venture funding and the management and growth of the nascent entrepreneurial venture. This capability informs the development of the Enterprise Project, enabling students to develop a proof-of-concept of their idea while examining its market potential and finally formulating a business proposal and report.

b. The Enterprise Project which commences at the start of the academic program and continues throughout the entire duration of study. It comprises an approximately, equal proportion of design/research-/development work and business/enterprise work. MTEI students will work in teams, together with MEEI students, working on technology-based entrepreneurial projects which require a multi-disciplinary approach.

c. Two graduate level modules which enable the student to develop advanced knowledge, at the graduate level, in fields which are complementary to the focus of the Enterprise Project. Knowledge in the specialized subject(s) will enable the student to develop a deep understanding that underpins the proposed enterprise.

The lecture, workshop and enterprise supervision are well integrated throughout the program and are also supported by a mentoring programme with practitioners from the business community. In addition to workshops, there will be regular supervisory meetings and individual consultations with students.

1.3 Method used for the preparation of the brief

This program is essentially an extension of the existing Master of Engineering in Entrepreneurship and Innovation (MEEI) program which will enable students without engineering or science degrees to gain comparable and complementary skills in technology-based business innovation. Consequently, a major impetus of the development of this program is the expressions of interest from university graduates with degrees in business, humanities, social sciences and health sciences. Enrolment statistics at a neighboring university (MBET program at the University of Waterloo) over the period 2005 to 2009 with a similar program have consistently achieved an intake of 4:1 ratio of non-engineers/scientists to engineers/scientists.

There have also been consultations within the McMaster academic community (faculty members and Deans from Business, Social Sciences and Health Sciences).   These consultations have confirmed the suitability of this degree configuration as an extension of the MEEI program concept.

1.4   Fields in the programs (indicate recent changes if any)

There are no separately identified fields within the TEI program.

1.5   Review concerns expressed in previous appraisal and actions taken

The March 18, 2008 letter from the OCGS Executive Director concerning the appraisal of the MEEI program mentioned three concerns which are to be addressed in the next appraisal. Since the proposed new MTEI program is very similar to the MEEI program, those concerns are addressed below:

> ### 1. Evaluation procedure for individual and team performance on the project component of the program.

Below is a suggested mechanism for handling individual and team-based evaluation in the modules and enterprise projects. This is roughly modeled after evaluations that are done in industry using tools such as a 360 degree evaluation. It is our belief that this will add value to the program for the candidates as well as satisfy OCGS' concerns with respect to evaluation:

Health Management

The Masters in Health Management program is delivered through a partnership between McMaster's DeGroote School of Business and School of Rehabilitation Sciences (Faculty of Health Sciences) and is offered through distance education on-line, on a part-time basis, and designed specifically for health professionals who are currently employed in a clinical and/or management capacity in any health care sector in Canada or internationally.

Many health professionals seek advanced knowledge and skills in health management as their careers progress. The complexity of the contemporary health care environment and the new demands made upon clinicians has made it necessary for practitioners seeking to move into management to acquire additional knowledge and skills that have evolved since they graduated from their baccalaureate programs.

The Master of Health Management (MHM) provides regulated health professionals with a combination of core management skills (accounting, finance, marketing, human resource management etc.) and a broad understanding of the Canadian health care policy development and service delivery environments (health system design, health policy analysis, and evidence based decision-making).

The program curriculum includes graduate course work and critical analysis and synthesis of management research to ensure the development of knowledge and skills for management of health care programs and organizations. By bringing together graduate courses from business and health care, the Master's program prepares graduates to work effectively in health management positions in the future. Students will gain the knowledge, skills and abilities necessary to excel as a middle or senior manager within both the public and private spheres of Canada's health care sector.

The core competencies identified below represent the minimum knowledge and skill expectations students will attain in order to complete the MHM program. These competencies are gained through coursework, self-study, group interaction and other experiential learning activities throughout the program.

1. **Lifelong Learning** (*Understanding, demonstrating and promoting the necessity for continuous learning among professional.*)

2. **Communication Skills** (*Understanding and demonstrating effective communication styles and techniques and use of related technologies.*)

3. **Conceptual Skills** (*Identifying, synthesizing and analyzing information in a coherent and methodical way to advance problem solving and the creation of new information.*)

4. **Awareness of the Political and Healthcare Environments** (*Awareness and appreciation of the complexities and interrelationship between the political and healthcare environments.*)

5. **Organizational Behaviour and Human Resource Management** (*Demonstrate an understanding of how organizations function and human resources plays a key role within organizations.*)

6. **Financial Management** (*Demonstrate an understanding of financial data and related management techniques which support good financial management practices.*)

7. **Research Awareness** (*Awareness and demonstrated understanding of the creation and use of research.*)

8. **Leadership** (*Awareness and demonstration of skills which motivate others to excel within an ethical and supportive environment.*)

Two short residency periods (3-4 days each) will be required of students during their time in the program.

Email: MHM@mcmaster.ca

Fax: 905.524.0069

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Staff / Fall 2010

PROFESSORS

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Mary Law, B.Sc.(Hons) (Queen's), M.Sc. (McMaster), Ph.D. (Waterloo)

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Lori Letts, B.Sc. (Western), M.A. (Waterloo), Ph.D. (York)

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Debra Stewart, B.Sc. (OT) (Toronto), M.Sc. (McMaster)

David Taylor, B.A. (Hons) (Toronto), M.P.A. (York), Ph.D. (York)

Joyce Tryssenaar, B.Sc. (Western), M.Ed. (Brock), Ph.D. (Western)

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Terence Flynn, B.A. (Carleton), M.S. (Syracuse), Ph.D. (Syracuse)

Bonny Fung-Ming Jung, B.Sc. (OT) (Toronto), M.Ed. (Brock), Ph.D. (ABD) (Western)

Christopher Longo, B.A. (York), M.Sc. (Western), Ph.D. (Toronto)

Teal McAteer, B.Comm (Queen's), M.I.R. (Toronto), Ph.D. (Toronto)

Glen Randall, B.A. (Hons) (McMaster), M.A. (McMaster), M.B.A. (McMaster), Ph.D. (Toronto)

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ASSISTANT CLINICAL PROFESSORS

Constance Mitchell, B.Sc. (OT) (Queen's), M.Sc. (OT) (Dalhousie)

Nancy Plews, Dip. (PT) (Mohawk), B.HSc. (McMaster), M.P.A. (Queen's)

The general regulations for this degree appear under the Regulations for Master's degrees near the beginning of this Calendar.

The admission requirements for the Masters in Health Management are:

The admission requirements for the Masters in Health Management include:

1. Regulated health professional (evidence of registration in the applicant's professional affiliation in his/her own province/country). Examples of regulated health professionals include audiologists, dieticians, nurses, occupational therapists, psychologists, physiotherapists.

2. Graduation with a minimum of a B+ average from a 4-year baccalaureate health professional program.

3. Two academic and two clinical/work place related references.

4. Written application outlining career plans, research interests and suitability for the Master of Health Management Program.

5. If the applicant's native language is not English, an official copy of their TOEFL score, or other evidence of competency in English. A minimum TOEFL (iBT) score of 92 (580 on the paper-based TOEFL test or 237 on the computer-based TOEFL test) is required.

Candidates must:
1. Complete with at least B- standing, six (6) graduate half courses. Five courses, HM *700, *705, *706, *707, *708 are mandatory.

2. Completion of one elective course. This may be chosen from among on-campus (e.g. Rehabilitation Science Program or Master of Business Administration Program), other distance education courses, including those offered by other universities, and may be geared towards the particular interests of the student. A list of pre-approved courses for electives has been created (see the website) and approved by the Associate Deans of Graduate Studies (Health Sciences and Business).

3. Complete HM 730 scholarly paper to demonstrate integrative thinking in the study of health management at a general and abstract level.

Courses
Courses marked with an asterisk (*) are half courses.

HM 700* **Health Systems and Policy**
This course is the introductory course for the Master of Health Management program. It will provide students with an understanding how the Canadian health care system is organized as well as how services are financed and delivered. This will be done through an assessment of the Canada Health Act and various pieces of related provincial healthcare legislation. Discussions will include an exploration of the for-profit and not-for-profit mix of services within Canada. In addition, students will be exposed to the principles of evidence-based decision-making and various health policy analysis tools. Current issues and trends in health policy (both within Canada and internationally) will serve as cases to which students apply those tools.

HM 705* **Evaluating Sources of Evidence for Management and Evaluation**
ThIs course is designed to provide students with the knowledge and skills to understand and critically evaluate sources of evidence used to support decision making within a health care environment. Students will develop knowledge about the principles of evidence based decision-making, searching the literature, and critically reviewing research methods and analyses. The course emphasizes the development of skills to apprise, synthesize and communicate evidence in order to use it within management decision-making.

HM 706* **Health Management Foundations I** *(pending GPCC approval)*
This course will enable students to develop knowledge and skills in related to management principles and practices involved in the delivery of health care products and services in for profit and not for profit environments. The impact of cultural and ethical issues on workplace structure will be examined in detail. Students will build skills in the selection and development of marketing and communication strategies. Course content includes: human resources; legal issues; negotiations; organizational behaviour; and marketing principles and theories and their application in health care management. Evaluation methods will include participation in online discussions, analytic review of health management marketing topic, and major paper focused on a foundational issue in health management.

HM 707* **Health Management Foundations II** *(pending GPCC approval)*
Through this course, students will gain knowledge about the fundamental concepts and practical issues related to accounting and finance and their uses in planning, decision making and control in health care management. Skills in the basics of managerial finance and managerial accounting, budgeting and forecasting will be developed through discussion, case studies and course assignments.

HM 708* **Leadership in Health Organizations** *(pending GPCC approval)*
This course explores principles, practices, trends and issues of leadership in health management settings. Current theories of leadership with attention to styles, practices, tasks and models will be covered. Participants will be encouraged to reflect on and analyze their own leadership experiences in light of theories studied. Through the

interplay of theory and practical application, participants will gain a deeper appreciation for the requirements, responsibilities, and consequences of effective leadership.

HM 730 / **Scholarly Paper** *(pending GPCC approval)*
This full course is designed as an opportunity for graduate course based students to demonstrate, in writing, their ability to integrate ideas that reflect current knowledge in areas of health management practice, education, research, and/or policy. The scholarly paper is to demonstrate integrative thinking at a general and abstract level. A student will identify a topic, and in consultation with a faculty member with expertise in the area develop a proposal that is individualized to the student's area of interest. The student will then develop the paper under the guidance of a faculty member. The paper must be 25 to 30 pages, excluding references and appendices. The paper does not typically involve the collection or analysis of primary data or the conduct of research with subjects. It is a scholarly essay, not a thesis.

Candidate Evaluation Mechanisms and Success Criteria

Program Item	Description	MEEI	MEEI & MTEI	MTEI
Program Course Content				
5 Core Learning Modules	Course-based learning of new business creation concepts and tools	Course instructor evaluates. Minimum grade of B-	Course instructor evaluates. Minimum grade of B-	Course instructor evaluates. Minimum grade of B-
2 Advanced Engineering Modules	Course-based learning of technological or engineering and business concepts and tools	Course instructor evaluates. Minimum grade of B-	Course instructor evaluates. Minimum grade of B-	
2 Graduate Level Courses	Course-based learning from any discipline with relevancy to Enterprise project			Course instructor evaluates. Minimum grade of B-
Program Enterprise Project				
Tollgate 1	Review of deliverables, analysis and concepts from phase 1 of the Enterprise project.	Enterprise Advisory Board, Go/No Go	Enterprise Advisory Board, Go/No Go	Enterprise Advisory Board, Go/No Go
Tollgate 2	Review of deliverables, analysis and concepts from phase 1 of the Enterprise project.	Enterprise Advisory Board, Go/No Go	Enterprise Advisory Board, Go/No Go	Enterprise Advisory Board, Go/No Go
Tollgate 3	Review of deliverables, analysis and concepts from phase 1 of the Enterprise project.	Enterprise Advisory Board, Go/No Go	Enterprise Advisory Board, Go/No Go	Enterprise Advisory Board, Go/No Go
Submitted Business Plan	Review of the business plan in its entirety	Enterprise Advisor Pass/Fail	Enterprise Advisor Pass/Fail	Enterprise Advisor Pass/Fail
Peer Evaluation	Review of candidate teamwork performance in the Enterprise Project team		Enterprise Advisor with input from Enterprise Team. Minimum rating of "Good"	Enterprise Advisor with input from Enterprise Team. Minimum rating of "Good"

Legend:

Green shade: Evaluation based on the individual only

Tan shade: Team is evaluated as a whole

Peer Evaluation and the Enterprise Project Team

The ability to effectively work in a team environment is an important learning outcome of team-based project work on the Enterprise project. Candidates will be mentored on their progress in this aspect by their enterprise advisor based on input from their peers in the project team and from the observations of the enterprise advisor. Team member evaluations will be collected in confidence from team members by the enterprise advisor, or their designate, on a six-month basis. Every six months the Enterprise Advisor will review the performance of the individual candidate in the team with the candidate. The enterprise advisor will generate an assessment of performance. To successfully complete the program, the candidate must maintain an average rating of "Good" over the span of the enterprise project.

Ratings of performance will be based on peer evaluation forms that are designed to qualitatively capture contributions to the project. The evaluation will assess performance in the categories of interpersonal interaction within the team, interaction with stakeholders external to the team, contribution to project direction and planning, and contribution to project execution. Candidates will receive assessment in each of these categories and an overall performance assessment. Overall ratings of "unsatisfactory", "satisfactory", "good", "very good", and "excellent " will characterize candidate performance on this metric. To successfully complete the program a candidate must achieve an average rating of "good" over the course of the enterprise project.

It will be the responsibility of each candidate in the program to work with their enterprise advisor to develop and implement plans for improvement of their contribution to teamwork. These plans and evaluations will be maintained in the candidate's program file.

2. Impact of faculty changes on delivery of the program

a. Delivery of the 5 EI modules: The materials for the five EI modules have been developed and are owned by the Xerox Centre. These materials are delivered by two permanent faculty and 3 sessional faculty members. We will add one more faculty and the Business School has added a chair in entrepreneurship. These additional resources will be an active part of this proposal and will greatly increase the stability and maintain the quality of delivery of the courses. In the last five years, two sessional faculty members were replaced without affecting the quality of delivery.

b. Technical mentors: One of the primary requirements for program delivery is that there are a sufficient number of faculty members to serve as technical in fmentors' subject matter expert to supervise the projects in the program. Up to January 2010, there have been 52 projects in the MEEI program involving 29 technical supervisors/mentors from Departments throughout McMaster. There has been no difficulty in attracting faculty members from a variety of disciplines to serve in that capacity. Based on that experience, it is expected that there will be a sufficient number of interested and qualified faculty available to serve in that capacity for students in the new TEI program. In fact, many faculty members have expressed interest in becoming technical mentors.

3. Plans of the Business School to increase expertise in entrepreneurship

The Teresa Cascioli Chair in Entrepreneurial Leadership was established in the DeGroote School of Business. Dr. Benson Honig, formerly Professor in the School of Business and Economics at Wilfred Laurier University, was appointed to that Chair in July 2009. Professor Honig's research interests include social and human capital, business planning, transnational entrepreneurship, nascent entrepreneurship, social entrepreneurship, and entrepreneurship in environments of

transition. He is a member of the Academy of Management, the Administrative Sciences Association of Canada, the Canadian Counsel of Small Business and Entrepreneurship, and the International Counsel for Small Business. Dr. Honig will be active in the TEI program.

1.6   Special matters and innovative features

The key innovation of this program is the use of multi-disciplinary teams (TEI and MEEI students) working together on a team enterprise project. These teams will pursue the necessary design, research and development work to ensure that the project has fully taken into account the technical, environmental and social dimensions followed by the business enterprise work that is required to successfully take the project to market.

In these multi-disciplinary teams, students will learn from each other to develop the necessary appreciation and knowledge of the technologies which are relevant to the particular project as well as the necessary business skills. They will also be guided by an Enterprise Advisor (concerned with the business aspects of the project), one or more Technical Mentors (number depending upon the nature/scope of the project and the size of the project team) and a Business Mentor (an external person with successful business experience) who will facilitate contacts and networking opportunities with the business/industrial community.

This program targets technology-savvy entrepreneurially-oriented people with the objective of enabling them to develop and hone their enterprise-creation skills. It is expected that students entering the TEI program will be energetic and forward-thinking individuals who hold university degrees in any fields. The program is particularly aimed at the following:

- recent graduates primarily interested in entering the world of business rather than undertaking further academic education and who recognize the need for developing skills in entrepreneurship and innovation,

- experienced graduates seeking career progression; these include individuals who are already operating their own businesses, those who want to branch out from employment to start their own businesses as well as people who wish to move upward within their companies,

- companies wishing to develop key employees (intrapreneurs) to lead corporate growth.

While students in the TEI program are not expected to have any engineering or scientific background, they are expected to be innovative. Some familiarity with technology is expected, but the required technological depth will depend on the project itself and will be evaluated on a case-by-case basis.

Unique Features which will be available to TEI students:

- Communications and Presentation training is inherent throughout the program as this skill is considered to be a cornerstone for starting a business. Each student is evaluated independently on their communication skills and, when deemed necessary, additional outside training in financials, communication and presentation skills is facilitated through the program. .
- Participation in Business Competitions and tradeshows throughout North America are enabled through the program. See Appendix B for a list of events where MEEI students have participated.

- Students will have the opportunity to join high performance research teams. The student team member has the task of determining the commercialization aspect of the research outcome of the project.

- Students are required to manage their project/business funding and formal reporting of expenses incurred for their cost centre.

- Students are encouraged to be self-driven in moving their project through the required tollgates of the program.

- Students are exposed to a broad internal McMaster network and external business, government and venture capital networks and are encouraged to enlarge their circle of interaction and be proactive in seeking advice, where required, from the same.

2. THE FACULTY

2.1 List of Faculty by Field

There are three full-time Engineering faculty including one professor holding the Walter G. Booth Chair in Engineering Entrepreneurship and Innovation, five full-time Business professors, one new position in Engineering and one full-time, other non-engineering faculty member that will be involved in the TEI program. In addition, there are four adjunct professors associated with the program.

Table 1 lists the faculty members currently involved in the MEEI program and who will be similarly involved with the Technology Entrepreneurship and Innovation (TEI) program. The core faculty members are the same as for the MEEI program with the addition of one new full-time faculty member (see below).

Table 2 lists the faculty members who are supervising projects. The following material introduces the faculty and describes their relevancy to the proposed program.

Category 1:

Dr. Rafik Loutfy, Walter Booth Chair in Engineering Entrepreneurship and Innovation. Professor Rafik Loutfy is an outstanding individual who holds the rank of Professor with tenure and is nationally and internationally recognized for his exceptional record of excellence and accomplishment in research and teaching. He has demonstrated highly visible leadership and mentoring roles in education and research related to entrepreneurship and innovation through the development of educational programs, research, and industrial interactions.

Dr. David Potter, Faculty of Engineering, Associate Teaching stream Professor, Walter G. Booth School of Engineering Practice, and Director of the Engineering and Management program. Dr. Potter brings several years of experience in the management of industrial research and development. As Manager of the Advanced Technologies Group, ShawCor Ltd., his team assessed emerging technologies for commercial potential. He has been active in the Conference Board of Canada's Innovation Council since its inception and currently serves as Chair. Dr. Potter earned his Ph.D. in Chemistry from the University of Waterloo.

New Hire – Associate
McMaster will be appointing an additional faculty member whose primary role will be to teach and take on supervisory responsibilities in the TEI and MEEI graduate programs. The successful candidate will have an established record of research and graduate supervision as well as having had considerable industrial and/or business experience.

Category 3: *The following faculty members have Category 3 appointments:*

Dr. Vishwanath Baba, Faculty of Business, Professor and Associate Member of the Walter G. Booth School of Engineering Practice. Dr. Baba holds a Ph.D. in Organizational Behaviour from the University of British Columbia. He is the former Dean of Business at McMaster University. Prior to this, he was the Associate Dean of Concordia University for two years. Dr. Baba has an MBA from Western Illinois University and a B.Eng. from the University of Madras.

Dr. N. Bontis, Faculty of Business, Associate Professor - Professor Bontis specializes in determining performance heterogeneity in firms due to the effective management of knowledge stocks and flows. His research interests include intellectual capital, knowledge management and organizational learning. He has conducted research in a variety of settings including the mutual fund and airline industries. He teaches case-based courses in strategic management and provides students with career counselling and independent research workshops.

Dr. Samir Chidiac, Faculty of Engineering, Director of the Walter G. Booth School of Engineering Practice. Dr. Chidiac is also Professor in the Department of Civil Engineering. His area of research is in structures and he returned to McMaster in 1999 after several years in industry. He is also an entrepreneur who started his own successful consulting company. He holds a B.Eng., M.Eng. and Ph.D. all from McMaster University.

Dr. Stephen Collins, Distinguished University Professor of the Michael G. DeGroote School of Medicine. Dr. Collins is a founding member of the Farncombe Family Digestive Health Research Institute and a leading scientist in the field of gastroenterology. He is the associate dean, research, for the Faculty of Health Sciences at McMaster University, a gastroenterologist for Hamilton Health Sciences and a Distinguished University Professor of the Michael G. DeGroote School of Medicine. He holds the GlaxoSmithKline Chair in gastroenterology. Collins received his medical training in the United Kingdom at University College London, Westminster Hospital Medical School and Leicester University Medical School.

Dr. Khaled Hassanein, Faculty of Business, Associate Member, Walter G. Booth School of Engineering Practice and Director of McMaster eBusiness Research Centre.

Dr. Benson Honig, Faculty of Business, Teresa Cascioli Chair in Entrepreneurial Leadership. Professor Honig's research interests include social and human capital, business planning, transnational entrepreneurship, nascent entrepreneurship, social entrepreneurship, and entrepreneurship in environments of transition.

Dr. John Medcof, Faculty of Business – Prof. Medcof holds a Ph.D. in Organization Behaviour from the University of Toronto. He is a full professor and was the Associate Dean of Business for a number of years. He is also a former Director of the Engineering and Management program.

Dr. Charlotte Yates, Faculty of Social Sciences – Dr. Yates has been a member of Labour Studies and the Department of Political Science, since arriving on campus in 1987. She is a full professor and has served as Assistant Director and Director of the Labour Studies Program. Currently, Dr. Yates is the Dean of the Faculty of Social Sciences. She is the author of two books and dozens of papers and articles on a variety of labour issues. Charlotte holds a Ph.D. in Political Science from Carleton University and a Master's from Queen's University.

Category 5:

Dr. H. D. Barber: Dr. Barber holds the appointment of Distinguished Professor-in-Residence in the Faculty of Engineering. He brings extensive business and industrial experience to the MEEI program after spending several years in business, most recently as the former President and CEO of Gennum Corporation. He is an officer of the Order of Canada.

Ms. Catherine Booth: Ms. Booth holds an Industry Professor appointment in the Walter G. Booth School of Engineering Practice. She holds a M.A.Sc in Management Sciences and a B.A.Sc. in Systems Design Engineering from the University of Waterloo. Her expertise is in project management and business/technology management at the senior executive level. Ms. Booth has taught the SEP*725/Practical Project Management for Today's Business Environment in the Walter G. Booth School of Engineering Practice.

Dr. Tom Corr: Industry Professor in the Walter G. Booth School of Engineering Practice. Incoming CEO of Ontario Centres of Excellence and former Associate Vice-President Commercialization, University of Waterloo, and CEO of the Accelerator Centre, Waterloo Research and Technology Park. His career spans over 30 years in the IT sector. Dr. Corr received his Doctor of Business degree from Henley Management College/Brunel University in England, and MBA from the University of Toronto. Dr. Corr has founded a number of successful software technology businesses and has extensive entrepreneurial experience.   Dr. Corr is currently the course instructor in SEP 723 New Venture Business Strategy.

Dr. Steve Treiber: Dr. Treiber holds a Ph.D. from McGill University, a Master's from the University of Toronto and a Bachelor's degree from McGill, all in chemical engineering. His field of expertise includes Industrial applications of Advanced Process Control. Dr. Treiber has founded a number of successful technology businesses since 1984 and has extensive entrepreneurial and intrapreneurial experience.   Dr. Treiber teaches SEP 724 Taking a New Venture to Market.

Category 6

Mr. Dominique Lalisse: Entrepreneur-in-Residence. Mr. Lalisse was the Lean Six Sigma deployment Manager at Xerox (Rochester, N.Y.) and has a wealth of experience in manufacturing, product development, business strategy, business plans, options and financial analysis. He has expertise in the area of business development and analysis.

Table 1 -   The Faculty

There are no separately identified fields within the program.				
Faculty Name & Rank	M/F	Ret. Date	Home Unit[1]	Supervisory Privileges[2]
Category 1				
R. Loutfy – Professor Walter Booth Chair Entrepreneurship & Innovation	M	2014	Eng'ng	Full
D. Potter – Associate	M	-	Eng'ng	Full
New Hire - Associate		-	To be determined	Full
Category 3				
V. Baba - Professor	M	-	Business	Full
N. Bontis—Associate Professor	M	-	Business	Full
S. Chidiac -- Professor	M	-	Eng'ng	Full
S. Collins – Professor	M	-	Health Sciences	Full
K. Hassanein – Associate	M	-	Business	Full
B. Honig – Professor, Teresa Cascioli Chair in Entrepreneurial Leadership	M	-	Business	Full
J. Medcof – Professor	M	-	Business	Full
C. Yates – Professor	F	-	Social Sciences	Full
Category 5				
H. D. Barber	M	-	Eng'ng	N/A
C. Booth	F	-	Eng'ng	N/A
T. Corr, Industry Professor Sessional Lecturer	M	-	Eng'ng	N/A
S. Treiber	M	-	Eng'ng	N/A
Category 6				
D. Lalisse, Entrepreneur-in-Residence	M	-	Eng'ng	N/A

Category 1: tenured or tenure-track core faculty members whose graduate involvement is exclusively in the graduate program under review. For this purpose the master's and doctoral streams of a program are considered as a single program. Membership in the graduate program, not the home unit, is the defining issue.

Category 2: non-tenure-track core faculty members whose graduate involvement is exclusively in the graduate program under review.

Category 3: tenured or tenure-track core faculty members who are involved in teaching and/or supervision in other graduate program(s) in addition to being a core member of the graduate program under review.

Category 4: non-tenure track core faculty members who are involved in teaching and/or supervision in other graduate program(s) in addition to being a core member of the graduate program under review.

Category 5: other core faculty: this category may include emeritus professors with supervisory privileges and persons appointed from government laboratories or industry as adjunct professors. Please explain who would fall into this category at your institution.

Category 6: non-core faculty who participate in the teaching of graduate courses.

Additional Faculty and Professional Resources

Technical Mentors (subject matter experts) and Business Mentors will play a key role in the TEI program as they do in the MEEI program. The roles are:

Technical (subject matter expert) Mentors In addition to the core faculty and lecturer participation, the TEI program will have Technical subject matter expert Mentors for each team of students. The XCEEi Mentorship Program is a face-to-face mentoring program whereby mentors and entrepreneurs are matched to establish an ongoing technical mentorship relationship throughout the duration of the student's Enterprise Project Development. Technical mentors are made available to XCEEi students only and are a mandatory component of the programs enterprise project development program.   The role of the technical mentor is to guide the student through the technical knowledge based component of the project. The mentor is the main point of contact throughout phase II (technology proof-of-concept of the idea) whilst dealing with technical questions throughout. Students are expected to meet with their technical mentors no less than once every week, especially during phase II.

Business Mentors: The role of the Business Mentor is to provide specialist assistance, especially with respect to the business aspect of the student project. The business mentor may also be a critical person for the student to consult in terms of market opportunities for the product/company. The business mentor is available to the student for approximately 10-20 hours over the course of the project. Students are encouraged to arrange regular meetings with their business mentor.

Table 2 lists the names of the technology, enterprise and business mentors for MEEI students over the past few years. (Names of students withheld due to privacy requirements).   The affiliations of the business mentors are also listed, offering an indication of the range of knowledge-based industries involved in the program.

Table 2 - MEEI Students / Technical Mentors / Business Mentors
Similar breadth and depth of mentorship expected for TEI program

Project Technical Mentor	Enterprise Advisor	Business Mentor
1. Dr. J. Valiant	Rafik Loutfy	Damien Lamb
2. Dr. R. Kleiman	Rafik Loutfy	Randy Reeve
3. Dr. Y. Haddara a	Rafik Loutfy	Mark Janoska
4. Dr. Y. Haddara	Rafik Loutfy	Dr. Paul Smith
5. Dr. J. Deen	Rafik Loutfy	Mark Chamberlain
6. Dr. Huang, Dr. Li	David Potter	Dr. Ross Bradsen
7. Dr. N. Nicolici	Rafik Loutfy	Avi Pollak
8. Dr. W. Leigh	Rafik Loutfy	Dr. Peter Kazmaier
9. Dr. R. Pelton	Rafik Loutfy	Darlene Homonka
10. Dr. F. L. Hall	Rafik Loutfy	M. Rifaat
11. Dr. T. Corr	Rafik Loutfy	Gerry Visca
12. Dr. A. Kitai	Rafik Loutfy	Mike Fielding
13. Dr. M. Hamed	Rafik Loutfy	
14. Dr. A. Hodginson	Rafik Loutfy	Dominic Talalla

15.	Dr. C. Xu	Rafik Loutfy	Mark Janoska
16.	Dr. S. Shirani	Rafik Loutfy	Joe Compta
17.	Dr. S. Shirani	Rafik Loutfy	Joe Compta
18.	Dr. M. Sklad	Rafik Loutfy	David Gray
19.	Dr. A Wassyng	Rafik Loutfy	Catherine Booth
20.	Dr. S. Shirani	Rafik Loutfy	Joe Compta
21.	Dr. B. Haynes	Loutfy/ Potter	Dr. Doug Barber
22.	Dr. M. Sain	Rafik Loutfy	Dr. Tony Redpath
23.	Dr. S. Sirouspour	Loutfy/ Potter	William Pitkin
24.	Dr. R. Kleiman	Loutfy/ Potter	Jason Cognac
25.	Dr. R. Selvaganapathy	Loutfy/ Potter	Dr. Tony Redpath
26.	Dr. S. Sirouspour	Loutfy/ Potter	William Pitkin
27.	Dr. B. Haynes	Rafik Loutfy	Dr. Douglas Barber
28.	Dr. T. Todd	Loutfy/ Potter	Stephen Elop
29.	Dr. T. Symanski	Loutfy/ Potter	Sean Licata
30.	Dr. A. Kitai	Loutfy/ Potter	George Webster
31.	Dr. A.Kitai	David Potter	
32.	Dr. A. Paez	Loutfy/ Potter	
33.	Dr. R. Kleiman	Loutfy/ Potter	Jason Cognac
34.	Dr. S. Sirouspour	Loutfy/ Potter	Mark Janoska
35.	Dr. K. Hasanein	David Potter	Rudy Karsan
36.	Dr. T Todd	David Potter	Joe Compta
37.	Dr. K. Sartipi	David Potter	
38.	Dr. J. Preston	David Potter	Mark Janoska
39.	Dr. K. Sartipi	David Potter	Sharon Meeke
40.	Dr. T Todd	David Potter	Sun Ho Kim
41.	Mr. N. Jadon	Rafik Loutfy	Marcel Mongeon
42.	Dr. S. Shirani	Rafik Loutfy	Ian Halliday
43.	Dr. N. Jadon	Rafik Loutfy	Marcel Mongeon
44.	Dr. R. Kleiman	Rafik Loutfy	Greg Roberts
45.	Dr. Shiping Zhu	Rafik Loutfy	Dr. Ross Bradsen
46.	Dr. C. Hall	David Potter	Susan Robinson
47.	Dr. Y. Haddara	David Potter	A. Thomson
48.	Dr. S. Hranilovic	David Potter	LogiStrok
49.	Dr. S. Shirani	David Potter	Dominic Tallala
50.	Dr. A. Horrex	David Potter	John Mroz
51.	Dr. Chan	David Potter	Farrow
52.	Dr. R. Kleiman	Rafik Loutfy	Arise Tech rep.

Table 2.1- MEEI program Business Mentors and their affiliations
(partial list of total of 72 Business Mentors)

Name	Title	Company
Dr. Darlene Homonka	Executive Director	Golden Horseshoe Biotechnology Network
Joe Compta	President	Bradon Technologies
Dr. H. Douglas Barber	Retired, Founder Gennum Distinguished Professor in Residence	Gennum Engineering, McMaster University
Dr. Ian Rodgers	Vice President, Research and Academic	St. Joseph's Healthcare
Mr. Mike Fielding	President & CEO	StrataFLEX Corporation
Mr. George Webster		Unified Engineering.com Corp.
Dr. Mark Janoska	Entrepreneur	
Avi Pollock	Financial Transactions and Payments	RBC
Jeff Giles	Co-Founder, Partner & President	MedProDirect Inc.
Damien Lamb,	Managing Director	Genesys Capital Partners Inc.
Dr. Peter Kazmaier	Area Manager	XRCC
Dr. Tony Redpath,	Managing Partner	Primaxis Technology Ventures
Mr. Mahmoud Enno	Self-employed	
Dominic Talalla	Managing Partner	Trellis Capital
Gerry Viscas	Partner, Creative Director	Network ISG
Mohsen Rifaat	President	MohDev International Inc.
Mr. William Pitkin,	Vice President, Outsourcing Services	First National Financial LP
Mark Chamberlain	President & CEO	Trivaris
Mr. Stephen Elop,	President	Microsoft Business Division
Dr. Paul Smith,	Lab Manager	XRCC
Randy Reeve,	Director/Consultant	Ivara and RR Consulting
Mr. Sean Licata	Founder	Strategic Ventures Consulting
Catherine Booth	former Sr.VP Information Services	Loblaw Companies Ltd.

Table 2.2 - Technical Mentors in MEEI program

(Partial list of approx. 120 faculty members in Engineering at McMaster University)

Technical Mentor	Department	University
Dr. Rafael Kleiman, Professor	Engineering Physics	McMaster University
Dr. Shahram Shirani, Associate Professor	Electrical & Computer Engineering	McMaster University
Dr. Brian Haynes, Professor & Chair	Clinical Epidemiology & Biostatistics	McMaster University
Dr. Adrian Kitai, Professor	Engineering Physics	McMaster University
Dr. Phil Koshy, Assistant Professor	Mechanical Engineering	McMaster University
Dr. Shahin Sirouspour, Assistant Professor	Electrical & Computer Engineering	McMaster University
Dr. Nicola Nicolici, Associate Professor	Electrical & Computer Engineering	McMaster University
Dr. John Valiant, Professor	Department of Chemistry	McMaster University
Dr. William Leigh, Professor	Chemistry	McMaster University
Dr. Mohini Sain, Professor	Faculty of Forestry	University of Toronto
Dr. Anthony Hodgson, Associate Professor	Mechanical Engineering	University of British Columbia
Dr. Robert Pelton, Professor	Chemical Engineering	McMaster University
Dr. Tom Corr, Associate V-P	Commercialization Res.	University of Waterloo
Dr. Fred Hall, Professor	Geography & Civil Engineering	McMaster University
Dr. Mateusz Sklad, Associate Professor	Mechanical Engineering	McMaster University
Dr. Jamal Deen, Professor	Electrical & Computer Engineering	McMaster University
Dr. Antonio Paez, Assistant Professor	School of Geography & Earth Science	McMaster University
Dr. Terry Todd, Professor	Electrical & Computer Engineering	McMaster University
Dr. Yaser Haddara, Assistant Professor	Electrical & Computer Engineering	McMaster University
Dr. Ted Szymanski, Professor	Electrical & Computer Engineering	McMaster University
Dr. Chang-Qing Xu, Professor	Engineering Physics	McMaster University
Dr. Alan Wassyng, Professor	Computing & Software	McMaster University

2.2 External Academic Project/Program funding

Table 2.3 presents the external funding received by the MEEI program by source and by year for the past four years. The MEEI program was fortunate to be a front-runner in realizing the importance of establishing a culture for entrepreneurship and innovation to thrive. The introduction of the MEEI program was embraced by the provincial government agencies and was successful in receiving 'seed' funding to invest in the academic projects/business of the students. The recent economic downturn, worldwide, has put traditional funding programs in disarray; however, we expect some stabilization to occur and anticipate recent funding levels for the TEI/MEEI programs to resume. We are continuously seeking new avenues of funding – such as foundations.

TABLE 2.3 - Funding available to support the students Enterprise Project
Students in the TEI program can expect to receive similar levels of funding to move their projects forward to fruition.

Operating Academic Program Funding by Source and Year				
	Source			
Year [1]	*Granting Councils [2]*	*Other Peer Adjudicated*	*Industry Agreement[3]*	*Others [4]* (government and foundation)
2005-06	$250,000 (OCE)			
2006-07	$250,000 (OCE)		$200,000 (Bell)	$ 63,559 (TECNet)
2007-08	$249,844 (OCE)		$200,000 (Bell)	$ 60,000 (Dobson) $159,543 (TECNet)
2008-09	$279,375 (OCE)		$(245,000) (Bell)	$ 50,000 (Dobson) $176,645(TECNet)
Totals	$1,029,219		$155,000	$509,747

[3] originally a $1M agreement payable over 5 years. First 2 installments received; however, due to economic downturn and re-alignment of corporate priorities, sponsor requested return of unspent funds ($245K).

[4]indicates funding provided to the Xerox Centre for Engineering Entrepreneurship and Innovation to promote the unique MEEI program and to participate in establishing and building an entrepreneurial culture in Ontario.

It is significant to note additional funding which was received:

- $1 million from Walter G. Booth to create the Walter G. Booth Chair in Engineering Entrepreneurship and Innovation

- $1 million from Xerox to name the Centre for Engineering Entrepreneurship and Innovation

- $2 million from Walter G. Booth to establish the School of Engineering Practice

2.3   Graduate supervision –TABLE 3 - Completed, and current, supervisors of master's, doctoral, and post-doctoral students, by faculty member

Completed and Current Numbers of Thesis[1] Supervisions by Faculty Member						
	Completed			*Current*		
Member	*Master's*	*PhD*	*PDF*	*Master's*	*PhD*	*PDF*
Loutfy, R.[1]	19 MEEI 12 MEEI (co-supervised)	0	1	19 MEEI 3 (co-supervised)	2 (co-supervised)	0
Potter, D.[1]	0 M.A.Sc. 7 MEEI 12 MEEI (co-supervised)	0	0	1 M.A.Sc. 15 MEEI 3 MEEI (co-supervised)	1	0
Baba, V.[3]	Unavailable				3	
Bontis, N.[3]	0	0	0	0	0	0
Chidiac, S.[3]	8	2	0	3	4	0
Collins, S.[3]	6	4	23	2	3	2
Hassanein, K.[3]	2	4	0	4	3	0
Honig, B.[3]	20	3	0	0	2	0
Medcof, J.[3]	0	0	0	0	0	0
Yates, C.[3]	4	3	1	1	3	1
Barber, D.[5]	7	3+3 D.I.C.	0	0	0	0
Booth, C.[5]	0	0	0	0	0	0
Corr, T.[5]	0	0	0	0	0	0
Treiber, S.[5]	0	0	0	0	0	0
Lalisse, D.[6]	0	0	0	0	0	0

2.4   Current teaching assignments

TABLE 4a - Graduate and undergraduate courses taught by each faculty member

Teaching Assignments for 2009/2010[1]				
Faculty Member[2]	*Rank*	*Undergraduate*	*Graduate[3]*	*Comments*
Loutfy, R.[1]	Professor		SEP 720	Director, XCEEi and MEEI program, holds endowed chair in EEI
Potter, D.[1]	Associate	Engn Mgt 3AA1 Engn Mgt 5B03	SEP 721 (mod 2)	Director, Engn & Mgt.
Baba, V.[3]	Professor	--	--	
Bontis, N.[3]	Associate	COM 4PA3 COM 1PA0 COM 4SY3	BUS P727 BUS P719	
Chidiac, S.[3]	Professor	CIV ENG 4K04	CIV ENG 761 CIV ENG 771	Director, WGB School of Eng. Practice
Collins, S.[3]	Professor	--	--	Associate Dean, Research, Health Sciences
Hassanein, K.[3]	Associate	--	BUS K603 (4 sections)	Chair, IS area, Business
Honig, B.[3]	Professor	--	BUS B748E	Endowed chair in Entrepreneurship in Bus,
Medcof, J.[3]	Professor	BUS 4BK3 MSC 646 (IESEG, France)	BUS B600 BUS B730 BUS E121UE	Chair, Human Resources and Manag. Area, DeGroote School of Business
Yates, C.[3]	Professor	--	--	Dean, Social Sci.
Barber, D.[5]	Distinguished Professor in Residence (Eng.)	--	--	Frequent guest lecturer in MEEI program
Booth, C.[5]	Professor (Adjunct)	--	--	
Corr, T.[5]	Industry Professor	--	SEP 723	CE0, Ont. Centres of Excellence
Treiber, S.[5]	Professor (Adjunct)	MIE 488 (Toronto)	SEP 724 APS 1088 (Toronto)	
Lalisse, D.[6]	Entre.-in-Residence	--	--	

TABLE 4b

Teaching Assignments for 2008/2009[1]				
Faculty Member[2]	**Rank**	**Undergraduate**	**Graduate[3]**	**Comments**
Loutfy, R.[1]	Professor		SEP 720	Director, XCEEi and MEEI program, holds endowed chair in EEI
Potter, D.[1]	Associate	Engn Mgt 3AA1 Engn Mgt 5B03	SEP 721 (mod 2)	Director, Engn & Mgt.
Baba, V.[3]	Professor	--	BUS B778 BUS DM0872 SEP 734	
Bontis, N.[3]	Associate	COM 4PA3 COM 1PA0 COM 4SY3	BUS P727 BUS P719	
Chidiac, S.[3]	Professor	CIV ENG 3P03 CIV ENG 4K04	CIV ENG 6K04 CIV ENG 732	Director, WGB School of Eng. Practice
Collins, S.[3]	Professor	--	--	Assoc. Dean, Res, Health Sciences
Hassanein, K.[3]	Associate	--	BUS K603 (4 sections)	Chair, IS area, Business
Honig, B.[3]	Professor	--	BU628 (Laurier) BU738 (Laurier) BU611 (Laurier)	
Medcof, J.[3]	Professor	BUS4BK3 MSC 646 (IESEG, France)	BUS B730 BUS E121UE (IESEG, France)	Chair, Human Res. and Manag. Area, Business
Yates, C.[3]	Professor	--	--	Dean, Social Sci.
Barber, D.[5]	Dist. Prof. in Residence (Eng.)	--	--	Frequent guest lecturer in MEEI program
Booth, C.[5]	Professor (Adj)	--	--	
Corr, T.[5]	Industry Professor	--	SEP 723	
Treiber, S.[5]	Professor (Adjunct)	MIE 488 (Toronto)	SEP 724 APS 1088 (Toronto)	
Lalisse, D.[6]	Entre.-in-Res.	--	--	

TABLE 4c

Teaching Assignments for 2007/08[1]				
Faculty Member[2]	**Rank**	**Undergraduate**	**Graduate[3]**	**Comments**
Loutfy, R.[1]	Professor		SEP 720	Director, XCEEi and MEEI program, endowed chair in EEI
Potter, D.[1]	Associate	ChE 3Q03	SEP 721 (mod 2)	Director, Engn & Mgt.
Baba, V.[3]	Professor	--	BUS B778 SEP 734	
Bontis, N.[3]	Associate	COM 4PA3 COM 1PA0 COM 4SY3	BUS P727 BUS P719	
Chidiac, S.[3]	Professor	CIV ENG 4K04	CIV ENG 732	Director, WGB School of Eng. Practice
Collins, S.[3]	Professor	--	--	Assoc. Dean, Research, Health Sciences
Hassanein, K.[3]	Associate	--	BUS K603 (4 sections)	Chair, IS area, Business
Honig, B.[3]	Professor	BU498P (Laurier)	BU611 (Laurier)	
Medcof, J.[3]	Professor	BUS4BK3 MSC 646 (IESEG, France)	BUS B600 BUS E121UE (IESEG, France)	Chair, Human Resources and Manag. Area, Business
Yates, C.[3]	Professor	--	PS761 W&S720 Work & Soc –Intro	Director, Labour Studies Program
Barber, D.[5]	Distinguished Prof. in Residence (Eng.)	--	--	Frequent guest lecturer in MEEI program
Booth, C.[5]	Professor (Adjunct)	--	SEP 725 SEP#733	
Corr, T.[5]	Industry Professor	--	SEP 723	
Treiber, S.[5]	Professor (Adjunct)	MIE 488 (Toronto)	SEP 724 APS1088 (Tor.)	
Lalisse, D.[6]	Entre.-in-Res.	--	--	

2.5 Commitment of faculties from other graduate programs and/or from other institutions

Similar to the MEEI program, most faculty members participating in the TEI program are also involved in other graduate programs. Their involvement will be accommodated within their normal teaching load in the following way:

The average faculty teaching load is one undergraduate course per term and one graduate course in either term, combined with the supervision of (on average) four graduate students (Masters of Applied Science, M.Eng and/or Ph.D. candidates). The graduate course loading will not change significantly with the introduction of this program since the load will be shared across the university' for the advanced studies component. No new courses will be introduced.

The more significant increase in load is that potentially represented by the supervision of projects. The work is, nevertheless, limited. No faculty member will be expected to supervise more than one project per year.

In addition, a new faculty member will be hired as enrolment scales up and this faculty member will be fully dedicated to teaching the entrepreneurship modules, as well as project supervision.

Other full-time and adjunct faculty members (e.g. Corr, Treiber) will also be involved in teaching the entrepreneurship modules on a paid overload or sessional work basis.

3. PHYSICAL AND FINANCIAL RESOURCES

The following physical resources will be available to TEI program students and will also be available to students in the MEEI program.

3.1 Library resources

The Science and Engineering (Thode) and School of Business library facilities of McMaster University will provide the main support for this program. These libraries have excellent collections of materials in all fields of engineering and business.

The relevant libraries are listed below. Additional details are provided in Appendix 3 which provides a statement from the Chief Librarian regarding the discipline assessment for engineering and business.

McMaster University:
    Thode Library (Engineering and Science)
    Innis Library (Business)
    Mills Memorial Library (University Library)

In addition to the McMaster University library facilities, access is given to MEEI and TEI students to the market research facilities at MaRS (**M**edical **a**nd **R**elated **S**cience) in Toronto. These market research reports are extremely costly and are a valuable resource to students in developing their projects.

3.2 Laboratory facilities

Prototyping laboratory: Students in the TEI program will have access to the Prototyping Laboratory of the Walter G. Booth School of Engineering Practice for rapid iterations in the ideation process, to explain ideas to clients and users, and for functional testing of design concepts. The Prototyping Laboratory will provide students with capabilities to show clients and users a more finished model through the use of advanced equipment such as vacuum forming, thermo forming and injection moulding. The prototyping shop includes basic requirements of workbenches and stools, hand tools for wood, plastic, and foam, wood working machines such band saws and drill presses, and metal working machinery such as CNC milling machines, as well as more sophisticated equipment such as rapid prototyping machines and 3D scanning equipment.

Access to MMRI (Materials Manufacturing Research Institute), machine shop, electronics lab, photonics lab in Engineering Physics, the ADL (Applied Dynamics Laboratory) and various computer clusters will be available to students. MMRI is 10,000 sq. ft. It has state-of-the-art

machining equipment and polymer processing equipment. In addition, students will have access to a unique micro manufacturing facility which was created this year.

In the areas of micro electronics, microwaves and photonics extensive experimental facilities exist in various laboratories for device, circuit and system design and testing.
In addition to these on-campus facilities, our mentors at other universities and industry also make laboratories, and equipment available to students to advance the development of their projects.

Other scientific facilities that will enable TEI students to move their projects forward are:

Centre for Emerging Device Technologies (CEDT) -- an organization that facilitates study of the optical, electrical, mechanical, and biological properties of semiconductors and related materials and promotes the development of technology based on these materials.

McMaster eBusiness Research Centre (MeRC) - MeRC research groups have developed expertise in areas of mobile commerce, eHealth, portals, identity theft, online negotiation, supply chain management, interface design, online trust and privacy, eLearning, knowledge management, and change management, among others.

McMaster RFID Applications Lab (MRAL) - It provides a hub for applications-oriented RFID research and development between academia and multiple industries, promoting investigation in technology, social policy, commercialization and business process. As is the inherent nature of entrepreneurial studies, shoe-string budgets and passion for project/business make the budding entrepreneurs ingenious in seeking out low-cost ways to move to the next step. Therefore, if they need equipment or facilities, they will be proactive in finding a suitable solution to augment the facilities listed above.

3.3 Computer facilities

Various computer clusters will also be available for the students equipped with advanced software in CAD, CAE and finite elements. In particular, there is a cluster of high-level computers in the Engineering Technology Building which are accessible to TEI students.

Students are encouraged to bring their own laptop as there will be internet hook-up and power outlets. Each student will however have their own dedicated lockable set of under-desk drawers allocated to them.

Each of the Centre's PCs will run on XP Pro. MS Office 2007 software is available on each PC, as well as, MS Project, Xerox DocuWorks 5 and Mindjet. The computers are networked and students will be provided with an account and password for this purpose.

Each student has a personal account on the XCEEi server which is backed up on a nightly basis. Unique to this program, XCEEi also provides web-based document management systems Docushare for student use. All students have accounts on Docushare and all MEEI course materials reside in course accounts on Docushare. All materials are securely accessible anytime from anywhere.

All faculty and graduate students are provided with an account on the university's central computer system. This account gives them access to electronic mail facilities, internet, and a

variety of standard software packages. Every effort is taken to provide the technology tools necessary to enable student projects/businesses to move forward to fruition.

Telephone sets with partial 905, and full 519, 613 and 416 area code access are shared among each of four work spaces.

3.4 Space

Both the TEI and MEEI programs are operated within the Xerox Centre for Entrepreneurship and Innovation (XCEEi), which is part of the Walter G. Booth School of Engineering Practice (BSEP). BSEP has recently moved into the new Engineering Technology Building (ETB) and occupies the entire 5th floor of that building, as well as having access to other facilities in the building, e.g. the cluster of high-level computers on the 2nd floor. The total area of the 5th floor, which is occupied solely by the Walter G. Booth School of Engineering Practice, is 2060 sq.m. or just over 22,000 sq. ft.

Facilities include faculty offices, office space for graduate students, a resource centre, team meeting rooms and classrooms for seminars and workshops.

Each student will have access to desk space. In addition, phones and PC's will be made available. However, this will not be on a dedicated basis as there will be need for sharing of phone lines and PC's.

3.5 Financial support of graduate students

TEI students will be eligible for university and external scholarship funding but will otherwise not receive any financial support, i.e. they will not be eligible for Teaching Assistantships.

As is the case with the students in the MEEI program, students pay their own tuition fees (which will be the same as in the MEEI program, i.e. approximately $5,000 per academic term for Canadian students) with some or all of those costs often being reimbursed by sponsoring employers, project sponsors, etc.

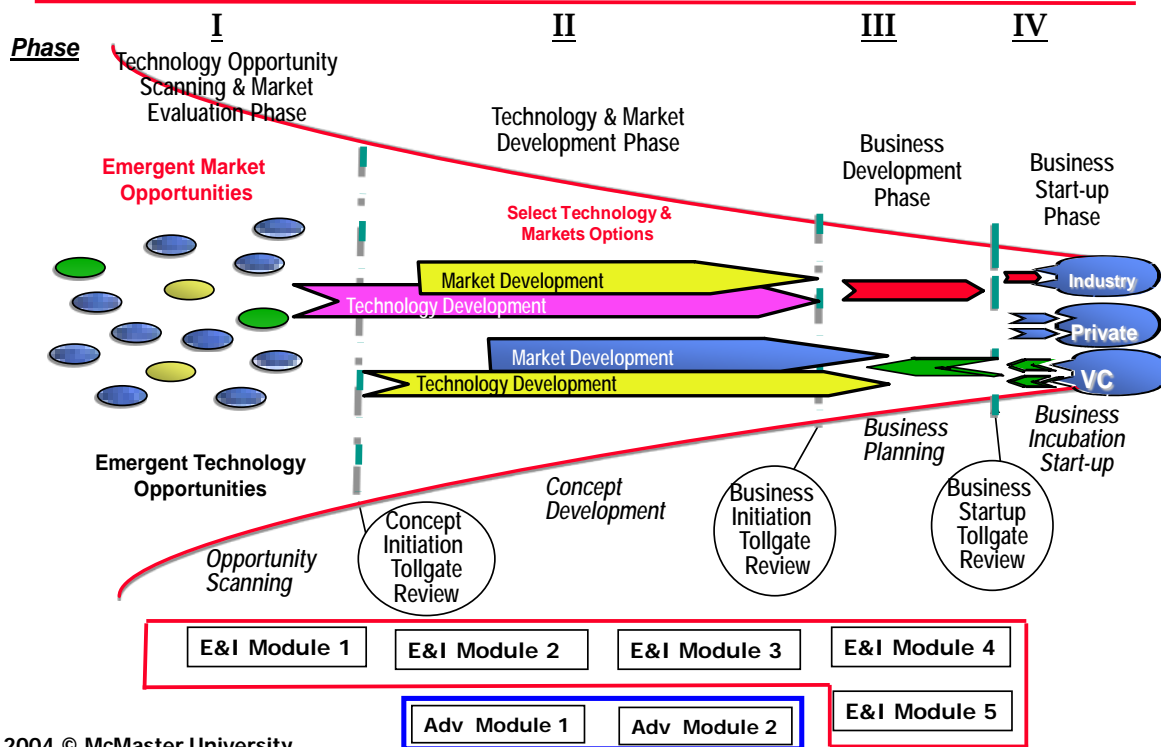### 4. PROGRAM REGULATIONS AND COURSES

4.1 The intellectual development and the educational experience of the student

The Xerox Centre for Engineering Entrepreneurship and Innovation (XCEEi) provides a physical and intellectual environment which is conducive to the intellectual development of graduate students. Students work in a business-type environment on the 5th floor of the new Engineering Technology Building, which includes dedicated office space for each graduate student, rooms for teams to meet and work together, presentation rooms and a resource area which contains current reference materials. Faculty members and support staff are located in the same area.

Students have full access to all of the McMaster library facilities, both physically and on-line. In addition, students have on-line access to several external on-line data and reference collections such as market research reports and business publications.

The flow of the program curriculum is designed specifically to meet the program objectives, i.e. to produce entrepreneurial professionals who recognize the importance of innovation and the role of technology in the development of a business enterprise, and who are able to implement the development of such an enterprise. Accordingly, the entire curriculum is organized around the Enterprise Project development process; this is shown graphically in the diagram below.

Enterprise Project Development Process

Phase

| I | II | III | IV |

Technology Opportunity Scanning & Market Evaluation Phase

Technology & Market Development Phase

Business Development Phase

Business Start-up Phase

Emergent Market Opportunities

Select Technology & Markets Options

Market Development

Technology Development

Industry

Private

VC

Market Development

Technology Development

Emergent Technology Opportunities

Business Planning

Business Incubation Start-up

Concept Development

Opportunity Scanning

Concept Initiation Tollgate Review

Business Initiation Tollgate Review

Business Startup Tollgate Review

| E&I Module 1 | E&I Module 2 | E&I Module 3 | E&I Module 4 |
| Adv Module 1 | Adv Module 2 | | E&I Module 5 |

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Students begin their program with a sequence of five Entrepreneurship and Innovation (EI) Modules (details of these are given below in the section on graduate courses) which are designed to facilitate student learning about enterprise creation and associated management processes. This knowledge is developed into capability through a series of accompanying interactive workshops that take the student through an entrepreneur's skill-set, know-how for venture funding and the management and growth of the nascent entrepreneurial venture.

The capability reached through the EI modules informs the development of the Enterprise Project, enabling students to develop a proof-of-concept of their idea, while examining its market potential and finally formulating a business proposal and report.

The lectures, workshops and enterprise supervision are well integrated throughout the year and a-half and are also supported by a mentoring program with practitioners from the business community. Also, throughout this period, students take two advanced study modules to enhance their learning, either by gaining more depth in their particular field, or gaining complementary skills, e.g. project management. Graduate courses which have been used for this purpose in the MEEI program are listed in the section on Graduate Courses.

In addition to workshops, there will be regular project team meetings as well as individual supervisory meetings between students and their technical mentors. XCEEi organizes invited speakers on a regular basis; these presentations are designed to facilitate the learning and professional development of the entire group of graduate students. The last annual 'Blast-off' week is an example of the calibre of invited speakers asked to address our students:

Speaking Topic	Speaker
Innovation	**Eugene Roman**, CIO, Open Text
Angel Investment	W. **Daniel Mothersill**, President, National Angel Capital Organization
What is venture capital?	**Jim Orlando**, Managing Director, OMERS Private Equity
Zero to Millions	**Mark Chamberlain,** CEO, Trivaris

There are significant opportunities for students to promote their projects/businesses within the university and elsewhere. Our students have made these presentations on campus to our funding sponsors (key representatives from the Ontario Centres of Excellence, the Ministry of Research and Innovation, Bell Canada and The John Dobson Foundation), at McMaster-wide business competitions and to VIP dignitaries who visit our campus.

Participation in Business Competitions and tradeshows throughout North America are enabled through the program. See Appendix B for a list of events where MEEI students have participated.

The MEEI and TEI programs place an emphasis on commercialization of technology through the development and implementation of the Enterprise Project. In most cases, the end result of this process includes venture capital financing for a new company, or licensing of the idea or the adoption of a new product by the originating company, organization or institution. As part of the due diligence process, MEEI and TEI students will, at times, need to file patents on their project ideas to ensure their future competitive advantage or that of the groups they are collaborating with. In this context, students become familiar with, and make use of the McMaster Intellectual Property policies which are applicable to their particular situation.

4.2 Program regulations

Program Curriculum

The program will bring together three elements:
1. Advanced Graduate Studies – to extend the candidate's understanding in his/her chosen field of entrepreneurial endeavour;
2. Entrepreneurial & Innovation Skills Development – to impart business management and enterprise skills applicable to the development of the engineering based enterprise;
3. The Enterprise Project Development – an exercise in technology development and transfer, combining engineering research and development performed in the host engineering departments with the commercial activities performed in the Centre for Engineering Entrepreneurship and Innovation.

The Advanced Graduate Studies are an integral component of the program and are offered by various departments at McMaster University. The objective is to acquire leading edge knowledge and apply them to the Enterprise project. The minimum studies course requirement is two (2) graduate level courses.

The course selection will be subject to departmental regulations and subject to the approval of the academic advisor, and Director of the TEI program.

While the MEEI students are required to take two "advanced graduate engineering" courses, the TEI students will also take two equivalent advanced graduate courses, not necessarily in engineering, but in field of expertise.

Entrepreneurial and Innovation Skills Development The business stream activities will be carried out in the Xerox Centre for Engineering Entrepreneurship and Innovation under the supervision of mentors from the business community and academic staff.

Five compulsory enterprise modules will focus on providing the Master's degree candidate's basic skills to select an idea with good potential, manage the innovation process, then create and manage the business outcome. The skills will broadly cover all the business life cycle from start-up, through growth to sustainability. The modules will develop an understanding of both the innovation and the entrepreneurial processes and through lectures, workshops and hands-on work, will enable the student to fully exploit the potential of the engineering enterprise project. Each module is considered the equivalent of a half-course as defined by the School of Graduate Studies, but will contain elements of lecture, group work, presentation and other activities as defined in the course outline. The module titles are:

1. SEP*720/Entrepreneurial Processes and Skills (semester 1)
2. SEP*721/Breakthrough Technology Venture Development (semester 2)
3. SEP*722/Positioning and Shaping an Enterprise (semester 3)
4. SEP*723/New Venture Business Strategy (semester 4)
5. SEP*724/Taking a New Venture to Market (semester 3)
A detailed description of these modules is provided in Appendix D.

The Enterprise Project Development The project is a major component of the program and work on the project commences at the start of the academic program and continues throughout the entire duration of study. It compromises an, approximately, equal proportion of design/research /development work and of business/enterprise work. While each project will be concerned with technology-based entrepreneurship, both technological and non-technological aspects will be included. Experience with current enterprise projects in the MEEI program has demonstrated that a multidisciplinary approach is needed. For example, the Digital Dash project requires multi-media experience and skills; the Liquid Fibre display project requires legal and marketing expertise.

Project selection is an important, and often difficult, task which is tackled at the very beginning of the program. There will be three major sources of enterprise projects:

• The student's own novel concepts and ideas, with the student(s) identifying the product or service area in which they intend to work based on their training and interests.

• McMaster faculty members, who wish to see their research ideas developed within the *Technology Entrepreneurship and Innovation* program; in such cases the faculty member would

normally be the student's supervisor or Technical Mentor (TM).

•   Third parties outside the university, e.g. industrial or government sponsors who wish to see ideas and/or intellectual property developed through this program in markets that they do not wish to develop themselves directly.

Students will normally be working in interdisciplinary teams with MEEI students and will, in that context, develop the necessary appreciation and knowledge of the technologies which are required for that area of business. These interdisciplinary teams will normally comprise 2 to 4 participants and will, at the very beginning of the project, identify clearly the contribution expected from each team member for the successful completion of the project.   Presentations during the various phases of the project will be done by the project team with participation of all members; reports will be required from both the team and the individual.

While students in the Technology Entrepreneurship and Innovation program are not expected to have any engineering or scientific background, they are expected to be innovative. Some familiarity with technology is expected to a certain extent, but the required technological depth will depend on the project itself and will be evaluated on a case-by-case basis. Considerable emphasis will be placed on team-based experiential learning in which all members of the team will learn from each other as they complete the project.

Program Duration

The TEI full program is expected to take up to 20 months full-time study or 28 months part-time. A compressed program of 12 months duration may be possible.

Similar to the established MEEI program, the type of learning and student-facilitator interactions in the TEI program will be a mix of all the following formats requiring knowledge management and communication software via the web.   The emphasis must be on facilitating easy communication that does not depend on where and when the person(s) need to communicate:

- One-place, One-time: e.g. classic lecture, seminar or discussion group, most probably at the University, but could be captured by video or audio for future use or dissemination to those not able to attend.

- One-place, Any-time: e.g. project space open for individual or group work.

- Any-place, One-time: e.g. group work or tutorial work via net meeting or video presentation, conference call.

- Any-place, Any-time: e.g. group work done independently or not time sensitive, such as posting questions or intermediate work on a web site, making available portions of work completed to other members of the group, posting material to be assessed or where feedback is requested. An alternative model is the Any-Place, Next Time (time-shifting) e.g. e-mail.

Each student within TEI program will need to have access to facilities and resources that allow flexible educational formats, with an emphasis on small group interdependent learning. Electronic communications will be as important, if not more important, than bricks and mortar facilities. Flexibility will be the key since the areas of advanced specialization provided by the

Departments in any given year will likely change and information in the entrepreneurship courses will be changing on a much faster time scale than traditional university courses.

Instructors will include a number of sessional instructors, mostly seconded from industry, and available for relatively short periods of time. Most courses will be given in concentrated format including evenings and weekends. This format is preferred by students as it enables them to complete course work intensively and then devote continuous periods to project work.

Support Structure for Team Projects

At an early stage, each team project will be assigned an Enterprise Advisor (EA) whose role is to guide and advise with the business aspect of the project. Enterprise advisors are Category I faculty within the program. The project will have one or more Technical Mentors (TM), the number depending upon the size of the project team and the nature of the project. Each project will have a Business Mentor (BM), who is an external (industry or government) person who will facilitate contacts and networking opportunities with the business/industrial community. The EA, BM and TMs will comprise the project supervisory team.

4.2.1 ENTRY REQUIREMENTS

The TEI program is a fast-paced program aimed at highly motivated students. All persons who wish to enter the program are required to have an undergraduate honours degree (or equivalent) and be eligible for admission to a McMaster graduate program (i.e. at least a B- average which is equivalent to a McMaster 7.0 GPA out of 12). Professional work experience is highly desirable.

Because of the importance of personal attributes such as innovativeness, entrepreneurial spirit and ability to work in teams, applicants need to meet several additional requirements. First, they are asked to provide the names of two potential referees who are contacted by XCEEI with regard to these specific personal attributes. For reference, a copy of the MEEI applicant referee evaluation is included in Appendix E. In addition, applicants will also be interviewed as part of the admission process.

The program attaches great value to appropriate experience. Therefore, prospective applicants who did not attain the required standing in their undergraduate degree, but who have at least four (4) years of relevant work experience, can discuss their situation with the program director. If the experience is deemed sufficient, the coordinator may then recommend an interview. Evidence of ability to do graduate work will still be required. (As noted in Section 2.1.3 of the McMaster School of Graduate Studies Calendar.)

4.2.2 ASSESSMENT

The academic assessment of the Project as a pass or fail will be judged not only on the soundness of the business plan and the appropriate level of understanding of the technology, but also on adherence to using the demonstrated proven processes and applying one's ingenuity and resourcefulness to technology transfer.

If the project is team-based, it will be shaped as an assembly of individual contributions in both the technical and business areas. Individual contribution will be assessed, as will team performance. The table given on page 6 provides details of the assessment criteria for the TEI program students and offers a comparator with the established MEEI program. On page 7 we

offered the mechanism for handling individual and team based evaluation in the enterprise project. This is roughly modeled after evaluations that are done in industry using tools such as a 360 degree evaluation. It is our belief that this will add value to the program for the candidates as well as satisfy OCGS concerns with respect to evaluation.

4.2.3 LANGUAGE REQUIREMENTS

For students for whom English is not their native language, an official copy of the TOEFL score, or other evidence of competency in English will be required. Applicants should consult the School of Graduate Studies calendar (section 2.1.8) for a more detailed explanation of the English language requirements acceptable for admission to the University.

4.2.4 DISTANCE DELIVERY

Not immediately applicable to this program

4.3 Part-time Students

Part-time students will be accommodated since most courses will be given in short format including evenings and weekends.

4.4 Total Graduate Courses Listed and Level

See Appendix D for the Innovation and Entrepreneurship Module descriptions.

In addition, students will be required to take two graduate courses from any McMaster department, as approved by the enterprise advisor.

TABLE 5 - Courses Taken by Graduate Students in MEEI program to date

Course	Faculty Member(s) responsible	2006/07[1]	2007/08[1]	2008/09[1]	2009/10[1]
SEP 6I03 T2#	G. Irons	--	--	--	1
SEP 6Z03#	C. Churchill	1	--	--	--
SEP* 701 T1#	A. Gildiner	--	1	--	--
SEP 702 T1#	B. Baetz	--	1	--	--
SEP 702 T2#	B. Baetz	--	--	--	1
SEP* 705 T1#	V. Grover/G.Krantzberg	1	4	--	--
SEP*710 T2	R. Loutfy	--	--	--	--
SEP*720 T3	D. Potter	--	--	--	--
SEP*720 T1	R. Loutfy	12	8	15	25
SEP*720, T2	R. Loutfy	3	--	--	--
SEP*721 T2	D. Potter	14	8	13	21
SEP*722, T1	T. Paine	--	--	--	--
SEP*722, T3	T. Paine/A. Seaman (2007/08); K. Ashacker (2008/09)	14	8	13	21

SEP* 723, T1	T. Corr (2006/07-2009/10)	13	14	7	13
SEP*723 , T2	J. Medcof (2005/06)	--	--	--	--
SEP*724, T3	S. Treiber	15	4	13	20
SEP*724, T1	S. Treiber	10	--	--	--
SEP*725	C. Booth (2005/06 - 2007/08); K. Fuller (2008/09 - 2009/10)	18 (13 MEEI)	10 (4 MEEI)	17 (11 MEEI)	29 (21 MEEI)
SEP*726	K. Hassanein	--	--	--	--
SEP* 732, T1#	J. Shah	--	--	1	5
SEP* 732, T2#	J. Shah	--	3	7	5
SEP* 760, T1#	R. Fleisig/H. Mahler	--	5	1	1
SEP* 761, T2#	R. Fleisig/H. Mahler	--	2	1	1

#MEEI students only

4.5 Collateral and Supporting Departments

Faculty of Engineering: All engineering departments will provide support through graduate course offerings being made available to the students enrolled in this program. In addition, several faculty members will be involved in supervision.

Business School: Faculty members from the Business School will be involved in teaching of selected entrepreneurship modules as well as participating in the supervision of graduate students.

XCEEi have established linkages with the Manchester Enterprise Centre in the United Kingdom, King Abdul Aziz University in Saudi Arabia, Indian Institute of Technology (Kanpur), and Tecnológico de Monterrey (IETSM) in Mexico.

We enjoy a partnership with the Centre of Business, Entrepreneurship and Technology (CBET) at the University of Waterloo through the C4-TECNet agreement. Funding from this agreement is instrumental in assisting to build an entrepreneurial culture linking the Hamilton-Wentworth region with the Kitchener-Waterloo region and enables enhanced training of the next generation of entrepreneurs.

The purpose of these linkages is to share course materials, and provide exchange opportunities for instructors and students. The significant benefit to students in the program is a more global view of entrepreneurship and market. These opportunities will also be made available to the TEI program.

5. OUTCOMES

5.1. Enrolment and graduations

The courses for the TEI program will be advertised and the dates firmly scheduled for presentation to enable students to plan their year within their working envelopes. Each course, on average, is projected to attract 15 TEI students in Year 1. This is projected to grow to a steady state of 30 (intake) by year 5.

As part of the Walter G. Booth School of Engineering Practice, the TEI students would have access to the full complement of courses offered through BSEP.

As an indicator of expected enrolment projections for the TEI program, included here are the outcome tables for the MEEI program from its inception in January 2005 to present:

Table 6 - Cohort Data for Engineering Entrepreneurship & Innovation

As of December 31, 2009

New Enrollments, Withdrawals, and Graduations by Year of Admission (Cohort Data)																	
		Through 3 Terms					Through 6 Terms					Through 9 Terms					
Academic Year	New	Trans PhD	Withd	Compl	IP		Trans PhD	Withd	Compl	IP		Trans PhD	Withd	Compl	IP	
					Full	Part				Full	Part				Full	Part
2004-2005	2	0	0	0	2	0	0	0	2	0	0	0	0	2	0	0
2005-2006	14	0	1	1	8	4	0	1	10	0	3	0	1	13	0	0
2006-2007	14	0	0	0	11	3	0	2	10	0	2	0	2	12	0	0
2007-2008	7	0	0	0	1	6	0	0	1	0	6					
2008-2009	14	0	2	0	6	6										
2009-2010	26															
Total	77	0	1	1	21	7	0	3	22	0	5	0	3	27	0	0

Table 6 Footnotes

1. *Academic year starting with the Fall term, followed by the Winter and Spring/Summer terms. Year shown in cells indicate the reporting year for which data are reportable. Blank cells indicate data are reportable for 2006-07 reporting year (November 1, 2006 status). Please indicate n/a (not applicable) for cells that are not applicable given the reporting timeframe with respect to the cohort year. E.g., for the 2004-05 cohort the number of Completions, Transfers and Withdrawals for the timeframes 7-9 terms (> 2, =< 3 years) and longer are "n/a" when reporting in 2006-07.*

5. *New enrolment or intake (admitted and registered for the first time) in a given academic year forms the cohort for that academic year. These include students transferred from a different master's program and include intake from all entry points (Fall, Winter, Spring/Summer terms) during an academic year. Students in each cohort are Transferred to a doctoral program, Complete the master's program, Withdraw from or remain In Progress in the program at various points in time. The number of students in a cohort is therefore equal to Total Completions, Total Transfers and Total Withdrawals, plus the number of students still In Progress. Or, $a = f+m+r+g$. New enrolment data are repeated in the Withdrawals, Transfers and Completions data tables.*

6. *Completion is associated with completion of all program requirements for the degree, and not the time of the degree being awarded or convocation. Where completion date is not available, the closest documented date indicating completion of requirements may be used. If that is not available, graduation date may be used. If program requirement completion date is used, the number of completions for a given timeframe in the above table may not be the same as graduations or degrees awarded in that timeframe. Total Completions is the number of Completions for all the timeframes indicated in the table, or $f = b+c+d+e$. Completion Rate or % Completion = Total Completion / New, or $x = f/a$. In measuring overall successful completion of a program, the Overall Completion Rate is the sum of Completion Rate and Transfer Rate. For any cohort, In Progress Rate plus Completion Rate, Transfer Rate and Withdrawal Rate is equal to 1. Or, $w+x+xx+xxx = 1$. Completion Rate plus Transfer Rate plus Withdrawal Rate for a cohort is equal to 1, if there are no In Progress students.*

7. *Average and median Time To Completion are calculated from the number of terms from first registration to the term and year when all requirements were completed, inclusive, in years to 1 decimal point, where 3 terms = 1 year. Median Time To Completion is the middle number of years where half of the Completions lie on either side. The median is the average of the 2 middle values where there is an even number of completions. Please also see footnote 3.*

8. *Students who are In Progress include those registered in the program and those on approved leave, such as maternity, paternal or illness, etc., including any authorized suspension of studies without loss of privileges. The number of students who remain In Progress are the number of students in the cohort (New) minus Total Completions, Total Transfers and Total Withdrawals, or $g = a-f-m-r$. If less than 9 terms have elapsed for a cohort, the number of students still In Progress is the number associated with the latest timeframe for which data are available. E.g., if 2 years have elapsed for a cohort, the number of students still In Progress is equal to the number of students in the cohort less the number of Completions, Transfers and Withdrawals for all timeframes up to and including 4-6 terms, or Total Completions, Total Transfers and Total Withdrawals respectively for the cohort. In Progress Rate or % In Progress = In Progress / New, or $w = g/a$. In Progress data are repeated in the Withdrawals and Completions data tables.*

9. *Students who were Transferred or promoted into the doctoral program without receiving a master's degree. Total number of Transfers for a cohort is the number of Transfers for all the timeframes indicated in the table, or $m = h+i+j+k$. Transfer Rate or % Transfer = Total Transfer / New, or $xx = m/a$.*

10. *Average and median Time To Transfer are calculated from the number of terms from first registration to the term and year of Transfer, in years to 1 decimal point, where 3 terms = 1 year. Median Time To Transfer is the middle number of years where half of the Transfers lie on either side. The median is the average of the 2 middle values where there is an even number of Transfers.*

11. *A student who fails to register and whose latest status for reporting is unknown is deemed Withdrawn and is reported under Withdrawals. Such a student and students who had been previously Withdrawn may be moved into the In Progress, Transferred or Completed columns in a later reporting timeframe if the student is reinstated or re-admitted by the program with the expectation that the student would complete his/her program. Such a student is still associated with his/her original cohort when first admitted. The Time To Completion for such a student is to be calculated from the term and year of 1st registration. In the event that such a student again Withdraws at a later point in time, the Time To Withdrawal for the cohort is to reflect the term and year of the latest Withdrawal. Total Withdrawal is the number of Withdrawals for all the timeframes indicated in the table, or $r = n+o+p+q$. Withdrawal Rate or % Withdrawal = Total Withdrawal / New, or $xxx = r/a$.*

12. *Average and median Time To Withdrawal are calculated from the number of terms from first registration to the term and year of Withdrawal, in years to 1 decimal point, where 3 terms = 1 year. Median Time To Withdrawal is the middle number of years where half of the Withdrawals lie on either side. The median is the average of the 2 middle values where there is an even number of Withdrawals.*

Table 7 - Flow-Through Data for Engineering Entrepreneurship & Innovation								
As of December 31, 2009								
Master								
Academic Year	Total Enrol	Female		Visa		Transfers	Withdrawals	Completions	Continuing
		#	%	#	%				
2004-2005	5	1	20	0	0	0	0	0	5
2005-2006	20	1	5	2	10	0	1	6	13
2006-2007	27	5	19	12	44	0	0	10	17
2007-2008	24	6	25	10	42	0	1	13	10
2008-2009	25	4	16	8	32	0	3	3	19
2009-2010	45	4	9	13	29				
Total						0	5	32	

Table 7 Footnotes

1. *Academic year starting with the Fall term, followed by the Winter and Spring/Summer terms.*

2. *New enrolment (admitted and registered for the first time) in that academic year. New enrolment is included in Student Complement.*

3. *All students, headcount, continuing from the previous academic year and new students registering for the 1st time in the academic year being reported, registered in the program in <u>any</u> of the 3 terms of that academic year. Students on approved leave, such as maternity, paternal or illness, etc., including any authorized suspension of studies without loss of privileges, <u>are</u> included. Student Complement is larger than November 1 enrolment headcount by the number of leaves and the number of students who register for the 1st time or otherwise in terms other than the Fall term.*

4. *Number and percent of Female students in Student Complement.*

5. *Number and percent of Visa students in Student Complement – visa status at 1st registration.*

13. *Number of students who withdrew within that academic year. Students who fail to register are deemed Withdrawn. Students who Withdrew or deemed Withdrawn during a given academic year may be reinstated or re-admitted by the program at a later point in time with the expectation that the student would*

14. *complete his/her program. Such a student is to be placed in Student Complement for the year of reinstatement or re-admission. A re-admitted student is not included in New, as the student is not a newly admitted student. The number of continuing students from the previous academic year plus the number of New students is then smaller than the Student Complement, indicating re-entry of a previously registered student. The Time To Completion for such a student is to be calculated from the term and year of 1st registration.*

15. *Number of students who were Transferred or promoted into the doctoral program without receiving a master's degree.Number of students who completed all program requirements within that academic year. Completions for a reporting period may not be the same as graduations or degrees awarded typically occur later than program Completion. Please also see footnote 10.Number of Continuing students is still in the program (registered and had not completed all requirements) or on approved leave at the end of that academic year.*

16. *Average Time To Completion – Elapsed Time – is calculated from the term and year of 1st registration to the term and year when all program requirements are Completed, inclusive, in years to 1 decimal point, where 3 terms = 1 year, for all Completions during the academic year being reported. It is not based on the term and year when the student graduated or awarded his/her degree. Where completion date is not available, the closest documented date indicating completion of requirements may be used. If that is not available, graduation date may be used.*

17. *Average Time To Completion – Excluding Leaves – is calculated from the term and year of 1st registration to the term and year when all program requirements are Completed, inclusive, in years to 1 decimal point, where 3 terms = 1 year, for all Completions during the academic year being reported, excluding terms on approved leave such as maternity, parental, illness, etc., and any authorized suspension of studies without loss of privileges. Completion time is not based on the term and year when the student graduated or awarded his/her degree. Where completion date is not available, the closest documented date indicating completion of requirements may be used. If that is not available, graduation date may be used.*

2, 3, 6, 7, 8, 9 *Student Complement for a given academic year = number of students Continuing from the previous academic year plus the number of New students in the current academic year Number of Continuing students at the end of the academic year = Student Complement (for the academic year) minus the number of Withdrawals, Transfers and Completions. The number of Continuing students at the end of a given academic year is equal to the number of Continuing students from the previous academic year plus New enrolment minus Withdrawals, Transfers and Completions.*

Tables similar to 6 and 7 should be provided for each type of master's program offered, e.g., MEng, MASc and MSc.

If the program is habitually offered on a part-time basis or to part-time students, separate tables should be provided for full- and part-time.

5.2 Employment

Generally, the students in this program will have some work experience. However, it is anticipated from the experience with similar professional programs that some students will take the program independent of an employer in order to retrain themselves for employment. This program will not only equip them with an excellent educational basis for seeking a technical and managerial position, but will provide them with excellent networking opportunities – often the key to finding employment as well as knowledge key to establishing their own businesses.

Initial employment (or status) of MEEI students graduating
August 31, 2006 through April 30, 2007

Finish Date	Start-up Company / Service created	Jobs Created	Employer
8/31/2006	Molecular Imaging at McMaster		Molecular Imaging
	Liquidesign	1	Liquidesign
8/31/2006	McMaster RFID Applications Lab	3	RFID Lab Manager, McMaster University
8/31/2006	Hannah Healthcare Solutions	0	National Portfolio Manager Telus
12/31/2006			Assistant Director Bell Canada
12/31/2006			Business development officer, McMaster University
4/30/2007			Tech Transfer officer, U of Waterloo
4/30/2007	MyStartup.com	1	MyStartup.com (self-employed)
4/30/2007	Navi-C	1	Analyst for VC
4/30/2007	Liquid Fibre Display	3	Liquid Fibre Display
4/30/2007	Ecowhile	2	Ecowhile
4/30/2007			Bell Canada

5.3 Publications

Since this is a project/course-based program, it is not expected or required that students produce research publications. However their projects might result in patents, trademarks, copyrights needed to protect their intellectual property. Also, the students are expected to participate in business plan competitions, such as TieQuest and the 50k LaunchPad among others. The business plans might be published according to the requirements of the organizing committee of the competitions. Finally, according to the need of the project, the students might create marketing collateral for their projects; this includes flyers, case studies, white papers, logos…etc

5.4 Projected graduate intake and enrolments

The target market of students for the MTEI degree is **ambitious** and **self-driven professionals** from three groups:
- Recent graduates (just finished their undergraduate degree)
- Young graduates (limited work experience – apprentice)
- Experienced graduates (in the workforce – work experience)

Table 8 - PROJECTED INTAKE AND ENROLMENTS Masters (M) Programs					
	FULL-TIME		PART-TIME		TOTAL ENROLMENT
YEAR	Intake	Enrolments	Intake	Enrolments	
	M	M	M	M	M
2010/2011	13	13	2	2	15
2011/2012	14	27	6	8	35
2012/2013	19	33	6	12	45
2013/2014	24	43	6	12	55
2014/2015	24	48	6	12	60

We believe the program will be equally attractive to all three segments; however, we believe that the enthusiasms and energy of young graduates is essential to create the excitement and vigour of the centre. Nonetheless, applicants with work experience will also be targeted since they will get more benefit from the program and possess the financial resources to fund their education in comparison to new graduates with a first degree.

It should be emphasised that the program does not just seek to develop entrepreneurs who can handle technology, but has the much broader market objective of developing a wide range of people to contribute effectively to innovation and business development teams. In particular, the program should take into account the rapid increase in the number of new companies started by women and address any issues that differentiate their participation in entrepreneurship.

APPENDIX A
2009/2010 MEEI Postgraduate Course Handbook

MASTER OF ENGINEERING ENTREPRENEURSHIP

AND INNOVATION (MEEI) PROGRAMME

DIRECTOR'S WELCOME

I would like to personally welcome you to the Xerox Centre for Engineering Entrepreneurship and Innovation and McMaster University. We appreciate your enrollment in our Master of Engineering Entrepreneurship and Innovation programme. The MEEI is the first experiential entrepreneurship program of its kind in Canada.

We expect the program will create a very exciting environment, which will provide you with rewarding opportunities to continue your scholastic, professional and business development career.

We have put together an outstanding team, whose common objective is to assist you in achieving your goal of becoming a successful entrepreneur. It is, however, up to you to ensure that you maximize the advantages of being in this special environment.

Again, welcome aboard and my sincere best wishes for your success in your postgraduate education.

Rafik Loutfy,
Director, Xerox Centre for Engineering
Entrepreneurship & Innovation

CONTENTS

PREMISE

The nature of industry is changing so that the small high technology companies led by engineers and scientists are becoming an increasingly important component of the economic landscape, forming a prime vehicle for the transfer of technology from the knowledge base to the market place. For engineers and scientists to drive and benefit from the changes, as owners of their own enterprises or as key employees in high technology firms, they must be able to work across the technology/business divide.

This program has been designed to appeal to engineers and scientists who would like to develop their entrepreneurial skills and go on to either develop their own business or work for a company where entrepreneurship is valued. It will also appeal to companies and organizations who want to use the program to develop their staff's entrepreneurial skills, and identify the potential economic value of in-company projects or licensable technologies that are ready for commercial development/ exploitation

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INTRODUCTION

This handbook covers issues with respect to the Master of Engineering Entrepreneurship and Innovation (MEEI) program and should be read in conjunction with the graduate calendar.

This Master's degree is offered by the School of Engineering Practice's Xerox Centre for Engineering Entrepreneurship and Innovation in the Faculty of Engineering, McMaster University. The faculties/ disciplines affiliated with the degree include:

Faculty of Engineering
MGD School of Business
Faculty of Science
Faculty of Health Science

These engineering, business and science faculties, where applicable, will be offering advanced engineering/science/business courses to our students. How this works should become apparent in the ensuing pages. It is recommended, therefore, that you read this document in your first week of entry to the program and that you retain it for future reference.

This is a very unique degree program where students will be working in teams on projects which have potential commercial value. The hope is that some of these projects will become very successful and that you will want to ensure that funding support will be available for students in the future.

All students, academic staff, support staff and mentors involved with the program sign a confidentiality agreement to protect all the ideas being developed and to create an open network within the Enterprise Development Lab for the exchange and sharing of ideas, problems and solutions.

Xerox Centre for Engineering Entrepreneurship and Innovation (XCEEi)

The aim of the XCEEi is to link academia and commerce, leveraging a unique innovation model that was developed and tested at Xerox. The application of the model will enable students to start with an idea and transform it to commercial reality through distinct steps and disciplined processes. The resulting knowledge transfer will lead to the creation of new commercial ventures.

The Centre offers a postgraduate level study leading to a Master of Engineering Entrepreneurship and Innovation degree, and can lead to the formation of a new company or a new business for existing companies. Students work within the Enterprise Development Lab on real-life business projects, where entrepreneurial instincts are encouraged, mentored and stimulated. Those ideas that have potential can then attract funding to enter into incubation or become new companies creating wealth for the individual and the society.

By stimulating the concept of technology based innovation and the pathway it cuts to the establishment of a successful business, we will be able to create a stream of entrepreneurially- minded individuals, as much at ease in the boardroom as in the research lab.

On completion of their programme of study, students will:
- Have the ability to identify markets for new knowledge and
- Have the tools to exploit those markets through creation of new products and services.

Moreover they will be capable of:
- Seeking out, understanding and keeping up to date with the most recent advances in their technical field,
- Identifying and researching markets, drawing up and implementing technical and commercial plans to target these markets effectively,
- Compiling and presenting business reports and plans,
- Effectively setting and achieving goals through team work,
- Building networks of support in expert and commercial communities,
- Raising and managing funds in support of their ventures,
- Launching start-ups.

Students will also have developed:
- A deeper knowledge and specialist skills in a selected area of technical knowledge,
- An ability to plan and execute a substantial piece of independent research and/or development in specialized technical field,
- Knowledge and understanding of the business founding, development and knowledge transfer processes,
- Knowledge and understanding of business and sales management, and business growth and development,
- Generic transferable skills in intellectual property protection, leadership, team building, negotiation, networking and business process innovation.

For this academic year, our program will include those students wishing to develop enterprises in the areas of Chemical Engineering, Civil Engineering, Computing and Software Engineering, Electrical & Computer Engineering, Engineering Physics, Materials Science and Engineering, Mechanical Engineering and health sciences.

CONTACT DETAILS

The initial point of contact for any administrative matters with respect to the programme is:

Deborah Smaluck, Administrator
Walter G. Booth School of Engineering Practice
McMaster University
ETB-511, 1280 Main Street West
Hamilton, Ontario L8S 0A3
905-525-9140 x26566
Fax: 905-528-7901
E-mail: smaluck@mcmaster.ca

The initial point of contact for academic, project ideas, enterprise project, advisor:

Name	Tel:	E-mail	Location
Dr. Davis Wilkinson	905-525-9140 Ext 24900	deaneng@mcmater.ca	JHE 261

Acting Director, McMaster School of Engineering Practice

Professor Rafik Loutfy	416-949-4355	loutfyr@mcmaster.ca	ETB - 513

Director, Xerox Centre for Engineering Entrepreneurship and Innovation

Professor David Potter	905-525-9140 Ext 23442	potterd@mcmaster.ca	ETB - 516

Director, Engineering & Management Program

Mr. Tarek Sadek	905-518-4512	tarekss@mcmaster.ca	ETB - 514

Enterprise Development Manager

Professor John Medcof	905-525-9140 Ext 26189	medcofj@mcmaster.ca	MGD-426

Director, Engineering & Management Program and Professor Degroote School of Business

Professor Khaled Hassanein	905-525-9140 Ext 23956	hassank@mcmaster.ca	MGD- 413

Associate Professor Degroote School of Business

Postal address:

Xerox Centre for Engineering Entrepreneurship & Innovation
School of Engineering Practice
Faculty of Engineering
McMaster University, ETB 511
1280 Main Street West
Hamilton, Ontario L8S 0A3

**MASTER OF ENGINEERING ENTREPRENEURSHIP AND INNOVATION (MEEI)
PROGRAMME STRUCTURE**

The program aims:
- To extend the candidate's understanding and technical knowledge in his/her chosen field of entrepreneurial endeavor,
- To impart business, management and enterprise skills and understanding of the business processes applicable to the development of a new venture,
- To expose the candidate to the processes involved in starting up and growing a business.

The MEEI is constructed in such a way as to allow students from different engineering and science disciplines to work in a common learning environment – the Enterprise Development Lab. The five Entrepreneurial & Innovation modules have been designed to facilitate student learning about enterprise creation and associated management processes. This knowledge is developed into capability through a series of accompanying interactive workshops that take the student through an entrepreneur's skill-set, know-how for venture funding and the management and growth of the nascent entrepreneurial venture. This capability informs the development of the project, enabling students to develop a proof-of-concept of their idea while examining its market potential and finally formulating a business proposal and report. The lecture, workshop and enterprise supervision are well integrated throughout the year and a half and are also supported by a mentoring programme with practitioners from the business community. In addition to workshops, there will be regular supervisory meetings and individual consultations with students.

Knowledge in the specialized technical subject will enable the student to develop a deep understanding that underpins the proposed enterprise. This knowledge will be provided in the departmental modules and be extended through research and prototype development (or its equivalent).

The business plan, proof-of-concept and go-to-market understanding and knowledge transfer aspects will form the final output of the program. Two enterprise reports are also expected at specific tollgates: a market research, intellectual property & technology development plan report is expected at the concept initiation tollgate and a draft business plan is expected at the business initiation tollgate.
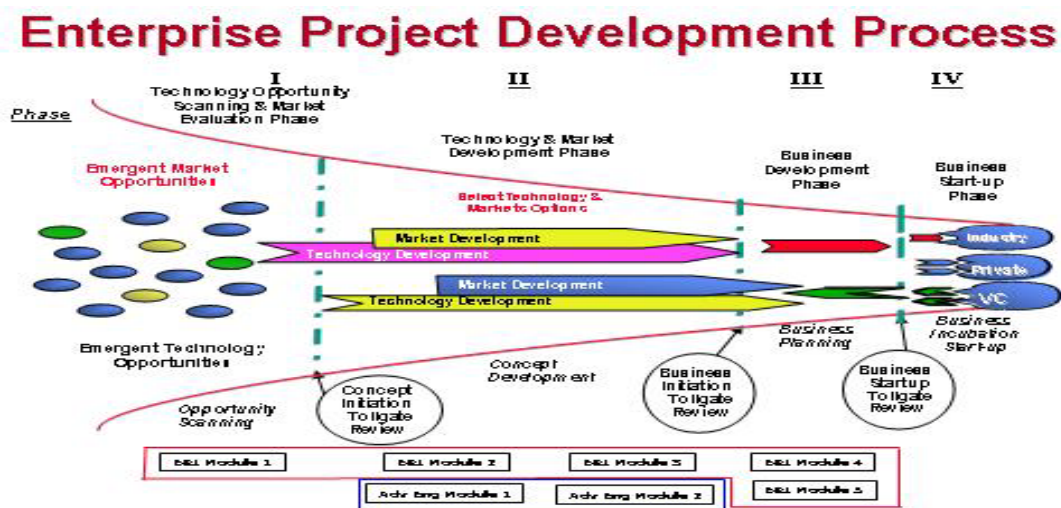
The MEEI degree will be granted once the student completes the 5 SEP modules, 2 advanced engineering modules with at least a B- average and passes all the enterprise project tollgates.

The Entrepreneurial & Innovation Module Leaders

The Team

Dr. Rafik Loutfy,

Professor & Walter Booth Chair of Engineering Entrepreneurship & Innovation

Dr. Loutfy recently joined McMaster University after a long and distinguished career with Xerox Corporation. Most recently he held the position of Corporate Vice President and Director of the Xerox Research Centre of Canada (XRCC). He received his Ph.D. from the University of Western Ontario and MBA from the University of Toronto. Rafik holds more than 44 patents and has published more than 168 articles.

Dr. David K. Potter

Associate Professor, School of Engineering Practice

As a recent addition to the faculty of the School of Engineering Practice, Dr. Potter brings several years of experience in the management of industrial research and development. As Manager of the Advanced Technologies Group, ShawCor Ltd., his team assessed emerging technologies for commercial potential. Prior to ShawCor, Dr. Potter was a Technology Development Manager with Tremco Ltd., a subsidiary of B.F. Goodrich. He has been active in the Conference Board of Canada's Innovation Council since it's inception and currently serves as Chair. Dr. Potter earned his Ph.D. in Chemistry from the University of Waterloo.

Dr. Steve Treiber

Principal, NEXI Inc.

Dr. Steven Treiber, started his own software and consulting firm in 1984, developing process control and real-time optimization applications and software for the oil, petrochemical, pulp and paper and other process industries. In 1998 he sold his company and served in various leadership roles in the new firm until 2002 when he left to start another company. Dr. Treiber was a part-time Associate Professor of Chemical Engineering at McMaster University in Hamilton, Ontario from 1983 to 1991. He obtained his PhD from McGill University in Chemical Engineering, specializing in process control.

Dr. Tom Corr

Associate Vice-President Commercialization, University of Waterloo, and CEO of the Accelerator Centre, Waterloo Research and Technology Park

Dr. Corr's career spans over 30 years in the IT sector including positions as Managing Partner at Catalyst Partnership; founder and CEO of Momentum Systems; founder, CEO and president of Applied Development Corp., president of Canadian Data Processing Corp. and Director of Commercialization - IT & Communications at the University of Toronto. Dr. Corr received his Doctor of Business degree from Henley Management College/Brunel University in England, and MBA from the University of Toronto.

COMPULUSORY ENTREPRENEURIAL & INNOVATION MODULES: SEP *720, 721, 722, 723, 724

Program: Master of Engineering Entrepreneurship and Innovation	
Title: Entrepreneurial Processes & Skills	
Module Code: SEP*720	Prerequisites: None
Aims & Objectives: Introduces the student to entrepreneurial processes and behavior. Enables the student to distinguish between ideas and business value creation. Facilitates student market research and intellectual property assessment for the development of their technology based business idea. Uses the market research data and intellectual property to formulate a concept initiation proposal and technology development plan.	
Lecture hours: 39	Coursework hours: 30
Private study hours: 30	Exam preparation hours: 10
Learning skills: At the end of this module the student will be able to: 1. Understand the fundamentals of entrepreneurial processes and behaviors. 2. Carry out assessment of their own learning style and entrepreneurial orientation. 3. Build more effective teams 4. Understand the creative process of business idea generation, screening and development 5. Understand how to assess business opportunities and its value creation potential 6. Carry out detailed market research for new business opportunity 7. Understand intellectual property management and protection issues 8. Carry out detailed intellectual property assessment for their idea 9. Understand the sources and creation of competitive advantage 10. Prepare Concept Initiation Proposal and development plan	
Outline syllabus: The context - the innovation process from idea to commercialization, the entrepreneurial processes and behaviors Entrepreneurial behavior – profiles of entrepreneur, and skills set that enable successful business venture Idea generation – creativity, innovation, value creation, patents, trademarks, confidentiality Team working – nature of groups and group dynamic, creation of high performance team behavior Exploring the market potential for technology ideas – understanding the customer, market research methods and techniques, market opportunity identification Concept initiation proposal and development plan preparation	
Coursework: One individual written assignment - (2000-3000 words maximum); 20%, One group assignment (10% on report 4000 words maximum and 10% on presentation); 20% Class participation; 20%	
Project Report and Presentation: Concept Initiation Proposal and Technology Development Plan report and presentation; 40%	
Reading list: Kawasaki, **The Art of the Start,** Portfolio 2004 Christensen and Raynor, **The Innovator's Solution,** HBS Press 2004 Kim and Mauborgne, **Blue Ocean Strategy,** Harvard Business School Press. 2005 Ibrahim, Ellis, **Entrepreneurship & Small Business Management,** Kendall/Hunt Publishing (2002) Timmons and Spinelli, **New Venture Creation Entrepreneurship for the 21st Century**, McGraw Hill I*rwin* (2003)	
Module Leader: R. O. Loutfy	Date of last revision: September 8, 2009

Program: Master of Engineering in Entrepreneurship and Innovation
Title: Breakthrough Technology Development

Module Code: SEP *721	**Prerequisites**: SEP*720

Aims & Objectives: Enable the student to shape a technology based business idea to be disruptive or sustaining. Facilitates the creation of the technology implementation plan for the student's enterprise project. Uses the technology development process to identify key technical proof-of-concept criteria and to competently assess technical capability with a prototype.

Lecture hours: 39	**Coursework hours:** 30
Private study hours: 30	**Exam preparation hours:** 10

Learning Goals: At the end of this module the student will be able to: 1. Identify the characteristics of disruptive innovation. 2. Shape the technology value proposition to yield a disruptive offering. 3. Conduct a competitive technology and market assessment. 4. Use QFD to identify the key technological deliverables and proof of concept criteria. 5. Integrate design fundamentals 6. Execute prototype development with an awareness of simulation and rapid prototyping options. 7. Layout the technology development plan including the intellectual property plan. 8. Develop a project plan including a risk management plan. 9. Carry out a project evaluation. 10. Conduct a technology capability assessment. 11. Generate the "Proof-of-concept" documentation.

Outline syllabus: Sustaining and disruptive innovation; shaping the value proposition for disruption; assessment of competitive technologies; identifying proof-of-concept criteria; design fundamentals; using simulation and prototyping; technology development planning; intellectual property plan; project planning and management; risk management plan; technology capability assessment.

Coursework: Two written assignment (2000-3000 words maximum);40%, One group assignment (4000 words maximum); 20%

Examinations: 2 hour examination paper; to answer 4 questions out of 8; 40%

Reading list: Key Texts: Christensen, Anthony and Roth, **Seeing What is Next,** Harvard Business School Press, 2004 Christensen and Raynor, **The Innovator's Solution,** Harvard Business School Publishing Corp., 2003, Cooper, **Winning at New Products** 3rd Edition, Basic Books, 2001. Norman, **The Design of Everyday Things, Basic Books**, 2002 edition. Vicente, **The Human Factor,** Alfred A. Knopf Canada – Random House, 2003. Hartman, **Don't Park Your Brain Outside,** Project Management Institute, 2000.

Module Leader: D.K. Potter **Other Staff:** Relevant external speakers as available	**Date of last revision:** September 8, 2009

Program: Master of Engineering in Entrepreneurship and Innovation	
Title: Positioning and Shaping an Enterprise	
Module Code: SEP *722	Prerequisites: SEP*720 & *721
Aims & Objectives: Provides the student with the tools to test his/her idea in the marketplace. Teaches the basics of financial statements and their significance to decision making. Enables the student to consider and manage business risk and develop a draft business plan.	
Lecture hours: 39	Coursework hours: 30
Private study hours: 30	Exam preparation hours: 10
Learning Goals: At the end of this module the student will be able to: 1. Conduct market testing of an idea or prototype. 2. Evaluate the current phase of the business cycle and its impact on the business plan. 3. Read and generate simple Income Statements, Balance Sheets and Cash Flow Statements to support a written business plan. 4. Quickly grasp financial fundamentals needed for decision making. 5. Identify possible sources of capital and their costs and understand the cost of capital for his/her plans. 6. Evaluate and mitigate business risks. 7. Prepare a written business plan.	
Outline syllabus: Market testing, economics, income statement, capital budgeting, cash flow, cost of capital, options, risk management, and developing a business plan.	
Coursework: Market testing written assignment (2000-3000 words maximum); 25% Financial fundamentals exam (90 – 120 min); 35% Case Based Business Plan Assignment (4000 words maximum); 40%	
Examinations: 1.5 to 2 hour examination paper; to answer all questions; 25%	
Reading list: Key Texts and Other Texts: Marketing: Jeffrey Moore. Crossing the Chasm. Others TBD Note: it is much more likely that a series of readings will be prepared in a binder.	
Module Leader: TBD Other Staff: Relevant external speakers as available	Date of last revision: September 8, 2009

Program: Master of Engineering Entrepreneurship and Innovation
Title: New Venture Business Strategy
Module Code: SEP *723   **Prerequisites:** SEP *720, *721, *724
Aims and Objectives:
Students will develop systematic statements of their business concepts, strategies and cases, and the financial and organizational strategies for their ventures.
Lecture Hours: 39   **Coursework Hours**: 30
Private Study Hours: 30   **Exam Preparation Hours**: 10
Learning Skills:
Entrepreneurship has been called the "engine of the economy" and, indeed, there is persuasive evidence that new firms contribute disproportionately to innovation and job creation. Entrepreneurs and their firms are celebrated by the media and their communities. But what does it take to start a business – a well documented Business Plan and some seed capital? The answer to this question is no. Most new businesses fail, and after 10 years only 1 start-up in 10 is still in business.

Entrepreneurs by definition must be optimistic and hard charging individuals, however, sometimes optimism and hard work cannot overcome the problems and issues that are encountered in the execution of a Business Plan – especially if the Business Plan is flawed. Business Plans are flawed if the underlying analysis that is incorporated into the assumptions that make up the Business Plan are incorrect.

Many tools have been developed to help entrepreneurs better understand the various factors that may affect their business going forward. The better the understanding of these factors as it relates to the environment that the business will operate in, the better the chances of success.

The overall goal of this module is to create a detailed analysis and understanding of the factors that may affect your business going forward, and to provide tools to better understand the underlying analysis and thinking that is important in the development of the Business Plan. This is key to the successful development of a plan to execute the Business Plan as will be undertaken in the next module. Some issues are common to all start-ups, while others are specific to the industry you're entering. Guest speakers with experience in various industry sectors and the venture capital community will provide a better understanding of these specific issues. Everyone will do an analysis of your specific potential start-up. The analysis requires research on the key issues facing firms in your sector. More information about this analysis will be provided in class.

A wise person once said "paper will accept all ink" which in terms of our course means that it is not hard to make assumptions, apply Excel, and *voila* a good looking Business Plan comes out of your printer. As a result of the learning's in this module, we will ensure that the underlying assumptions made for your Business Plan have been well thought out, can pass the test of the questioning of potential investors and other stakeholders, anticipate the problems to be faced by your venture so they can be managed through advance planning; and most importantly ensures that you have given your business strategy the rigorous analysis that all start-ups require.
Regular attendance and in-class contribution are critical to achieving the course objectives. Your class contribution grade includes participation in class discussions and your engagement with speakers. Please let me know beforehand if you need to miss a class. Readings from the course readings should be read before class. I will advise in advance of any material that should be read before a specific class. Feel free to let me know about any interesting articles you find related to course topics.
The guest speakers are all extremely approachable and interested in talking with you. Please make the most of these sessions. Please note that the schedule for the speakers, and the speakers themselves, may change subject to their availability.
By completion of this course you will acquire the knowledge base and understanding necessary to write the components of a business plan and you will have acquired skills for critiquing business plans and for eliciting, accepting and incorporating critiques of your own plans. |

Outline Syllabus:
1. Course Overview and a discussion of what goes into a Business Plan and Elevator Pitch
2. Strategic Analysis Tools
3. Strategic Analysis Presentations
4. Business Strategies: Starting a High-Tech Venture
5. Business Strategies: Starting a Service Based Venture
6. Business Strategies: Starting a Low-Tech Venture
7. Entering Foreign Markets, and Business Models (franchising vs. direct sales)
8. Building the Financial Case
9. Financial Requirements and Valuation
10. Ownership, Organizational Structure & Governance
11. Business Plan Presentation Rehearsals
12. Business Plan Presentations
13. Business Plan Presentations

Coursework:
The course has been largely designed to be self-contained. Most of the reading and analysis will be scheduled within the course itself.

Examinations:
There will be no written examinations. The presentations and class participation will form the bulk of your marks. Class participation includes feedback and critique of your fellow student's presentations.
> ***18. Elevator Pitch -***   ***5%***

Strategic Analysis **–**   25%
Financial Plan –   25%
Business Plan –   25%
Class Participation -   20%

Reading List:
Advance preparations - Required Materials:
Text books
Blue Ocean Strategy: *How to Create Uncontested Market Space and Make Competition Irrelevant,* by W. Chan Kim and Renee Mauborgne, Harvard Business School Press. 2005 - Website:
http://www.blueoceanstrategy.com/
The Art of the Start: *The Time-Tested, Battle-Hardened Guide for Anyone Starting Anything,* by Guy Kawasaki, Penguin Group, 2004 - Website: http://www.artofthestart.com/

Module Leader: Tom Corr **Other Staff:** Relevant external speakers as available	**Date of last revision:** September 8, 2009

Program: Master of Engineering in Entrepreneurship and Innovation	
Title: Taking the New Venture to Market	
Module Code: SEP *724	**Prerequisites:** Module SEP *720, *721, *722
Aims & Objectives: Teaches the basics of how to develop an implementation plan with emphasis on how to market, sell, finance the start-up, and sustain growth. It's main objective is to focus the entrepreneur's attention on the customer and the market served.	
Lecture + workshop hours: 60	**Coursework hours:** 30
	Exam preparation hours: 10

Learning Goals:
At the end of this module the student will be able to:
- Complete their business implementation plan.
- Establish their corporation or partnership.
- Successfully seek financing to start their company.
- Sell their offering and support their customers' success.
- Plan for the successful growth of their business.

Outline syllabus:
  The nature of innovation is that there are always more voices saying that something cannot be done, or should not be done. Technology entrepreneurs are usually driven by passion for their work, deep belief in its efficacy, optimism, and a willingness to accept risk. These characteristics sustain them while they are bombarded by discouraging feedback. Unfortunately, it is often these characteristics that result in entrepreneurs not listening to good advice, from their clients, colleagues, and supporters. This module is about how to find the good advice, listen to it, and act on it.
  The course will be presented in a series of workshops that will last approximately 6 hours each. The workshop methodology will follow a "McKinsey style" strategy development but will deliver an implementation plan to be acted on. Each of the workshops will use case studies of real technology start-up businesses to illustrate the points being made in the workshop. Outside speakers with relevant experience will be invited to address the students. These people would be VC's, salesmen, entrepreneurs.

Coursework:
  Two written assignment (2000-3000 words maximum);40%,
  Completion of the Business Plan (4000 words maximum); 10%

Examinations:
  2 hour examination paper; 50%

Reading list:
Larry Bossidy, Ram Charan, Charles Burck, **Execution: The Discipline of Getting Things Done,**
James C. Collins, Jerry I. Porras, **Built to Last: Successful Habits of Visionary Companies,**
Roger Fisher, William Ury, Bruce Patton, **Getting to Yes: Negotiating Agreement Without Giving In,**
Gary Karrass, **Negotiate To Close : How To Make More Successful Deals,**
Lawrence G. Friedman, **Go To Market Strategy: Advanced Techniques and Tools for Selling More Products to More Customers More Profitably,**
Lawrence G. Friedman, **The Channel Advantage,**
Bob , **How Venture Capital Works,**

Module Leader: S.S. Treiber	
Other Staff: Relevant external speakers as available	**Revision Date:** September 8, 2009

ENTERPRISE PROJECT DEVELOPMENT PROCESS AND MANAGEMENT

The project is a major component of the program and work on the project commences at the start of the academic program and continues throughout the entire duration of study. It compromises 480 hours of technology/design and research and development work and 480 hours of enterprise work. You will have technical mentor (TM) and Enterprise advisor (EA) to guide you, plus a business mentor (BM), if appropriate, who will enable you to make contact with the business and commercial community. You will spend a substantial amount of your time working on your project in the Enterprise Development Lab and with customers in the market place.

As the project has commercial exploitation potential, it is important that the original idea (background Intellectual Property (IP)) is documented clearly at the start of the project. It is also important that all students maintain an up-to-date record of the work they undertake both in the department or company lab and at the Enterprise Development Lab. This will ensure that if the project becomes a business it will be possible to allocate a share of ownership to those who have contributed to the original idea. Issues of copyright, confidentiality and non-disclosure will be discussed and suitable arrangements agreed upon for your project.

There are three phases to the enterprise project:
- Phase I ends with a Concept Initiation Proposal [report and a presentation], that describes the value creation idea, the market opportunity, the uniqueness of the intellectual property to be exploited, and a technology development plan. We will target to submit these proposals to NSERC I2I program to request funding for the technology proof-of-concept phase.
- Phase II ends with a Business Initiation Proposal [report and a presentation], that describes the technology proof-of-concept, the market development and a draft business plan. The Business Initiation Proposals will be submitted to NSERC I2I-2 or BDC or angel investors to request pre-seed money to develop the full business and implementation plans.
- Phase III ends with a Business Start-up Proposal [report and a presentation], that describes the business strategy, underlying technology advantage and the go-to-market plan. We will arrange for these presentations to be delivered to various funding agencies such as VC, BDC, new business development units of companies to attract seed fund to incubate or start the NewCo.

There are therefore some important deadlines for you to meet:
- Discuss, agree and sign the project brief (a single page) with your technical mentor and enterprise advisor and submit it to the XCEEi director – one month after program start
- Presenting the Concept Initiation Proposal and preliminary Technology Development Plan to advisory board (about 4-6 months into the program)
- Presenting the Business Initiation Proposal to the advisory board (about 12 month into the program)
- Presenting the Business Plan and go-to-market plan to the advisory board (about 18 month after start for full time students)

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1. The Support Structure

The prime responsibility for the effective management of the project lies with you. You need to be proactive in seeking the assistance that you require.

At an early stage, you will be assigned an enterprise advisor (EA). You will be assigned a technical mentor (TM) resident in your engineering department. The third member of the supervisory team is a business mentor.

1.1 **The role of the Technical Mentor (TM)** is to guide you through the technical knowledge based component of the project. The TM will be your main point of contact throughout phase II (technology proof-of-concept of the idea) whilst dealing with technical questions throughout. You should have meetings with your TM no less than once every week, especially during phase II. This should ensure that you stay on track and are provided with the specialist assistance needed.

1.2 **The role of the Enterprise Advisor (EA)** is to guide you and advise you with the business aspect of your project/proposition. The EA will bring market awareness and structure your work to integrate standard business and marketing procedures. The EA will be your prime advisor on the technology transfer aspect assisted by a business mentor as appropriate. Weekly workshops will be organized by your EA with other students so you can benefit from assistance on a collective basis. When you require individual help, you should make an appointment to see your EA outside the workshops. You should endeavor to see your EA on a regular basis especially during Phases I and III.

1.3 **The role of the Business Mentor (BM)** is to provide specialist assistance, especially with business aspect of your project. The mentor may also be critical person to consult in terms of market opportunities for your product/company. A mentor will be available to you for around 10-20 hours over the course of your project. Make sure you employ this expertise. You should arrange to meet your mentor regularly. They usually will come to see you at the Enterprise Development Lab.

2. The Project Phases (Tollgate Reviews)
Your complete project has three phases that you must complete and pass to graduate. Each phase has two equally important components one technical and the other business:

Phase I	Phase II	Phase III
- Concept initiation proposal - Technology development plan	- Market Development - Technical Proof-of-concept - Draft Financial Plan	- Business Strategy - Business Plan, and - Go-to-market plan

2.1 Phase 1 (end with Concept Initiation Proposal) establishes the value creation potential for the product or service under consideration. In the preliminary report, you should seek to address the issue of the knowledge basis of your product, its value proposition and the market that you might enter. You need to gather evidence that will substantiate the market size. Having considered this fundamental issue, you will consider in more detail the demand issue, why is your new product in demand, what is its competition, how can demand be gauged objectively and reliably, what price will the market bear and why. Then you address the intellectual property issue, IP uniqueness, how copy able the idea/concept/product may be, and how you can protect yourself against piracy. Finally, you should describe the technology development plan that includes the critical technological advances that need to be demonstrated to proof the concept and the associated resources you will need to develop the technology proof-of-concept. You should also anticipate some of the threats, which you might find in the market through the use of a SWOT (Strength, Weakness, Opportunity and Threat) analysis.

The Concept Initiation Proposal report (approximately 10 pages or 3-5000 words) should be submitted whenever the student has gathered all the required information and is ready. This report is then reviewed by your Enterprise Advisor providing you with useful formative feedback before your presentation. As soon as it can be scheduled you will be invited to offer a presentation to your TM, EA and your BM team and will again be provided with formative feedback. With the help of ORCIP (Office of Research Contract & Intellectual Property) students will also be submitting their report to NSERC I2I program to raise funds for the next phase of work.

2.2 Phase II (ends with Business Initiation Proposal) is the formal commencement of the research & development and market development phase. Informed by the phase I technology development plan, the crucial R&D is done to demonstrate proof-of-concept while undergoing further market development. In this phase the student will attempt to shape the product or services as a market disruptor. Technical guidance is primarily obtained from your technical advisor as subject matter expert, while business guidance will be obtained from the business mentor. Phase 2 concludes with the production of an engineering dissertation describing your research and development that led to the technical proof-of-concept. With the completion of the market development effort the student will be asked to prepare a draft business plan report.

The Business Initiation Proposal Report [engineering dissertation and draft financial plan] (approximately 15 pages or 5-7000 words) should be submitted whenever the student has gathered all the required information and is ready to report. This report is then reviewed by your Enterprise Advisor providing you with useful formative feedback before your presentation. As soon as it can be scheduled you will be invited to offer a presentation to your board (TM, EA, and your BM) and will again be provided with formative feedback. Enterprise project board meetings are held every 4 to 6 weeks commencing after the completion of phase I and continue until the end of phase III.

With the help of your business development officer students will also be submitting their report to NSERC I2I-2 and other appropriate funding agencies to raise funds for the full business plan development.

2.3 Phase III (ends with Business Start-up Proposal) is the final phase of your enterprise project. This enterprise investigation culminates in proposing a business strategy for the venture and specifying the path for the venture implementation and examining funding implications. In this phase, you will assess the implications of the development in phase II, and develop a business plan and describe the best route for commercialization having examined a range of options.

The final Business Start-up Proposal report has a suggested length of about 15-20 pages (5-7000 words) plus appendices. The business plan for the new venture report should be 8 to 10 pages plus appendices and the go-to-market report should be 7 to 10 pages. You must understand that as the enterprise investigation continues, you may, in fact, come to the conclusion that there is no real prospect for your venture. If that is the case, you will need to produce a venture feasibility report instead of the business plan describing why the venture may have to be abandoned or reshaped. These reports should be submitted whenever the student has gathered all the required information and is ready to report. This report is then reviewed by your Enterprise Advisor and business mentor providing you with useful formative feedback before your presentation. As soon as it can be scheduled you will be invited to offer a Master's defense presentation to your board (enterprise technical advisor, enterprise business advisor and your business mentor). At this meeting, if the student meets all of the School of Graduate Studies requirements, the recommendation would then be to grant the Master's degree. More details on the structure of the final business start-up report, business plan or venture feasibility report will be provided during the session.

ASSESSMENT PROCEDURES AND GUIDELINES

1. The System
All E&I modules are assessed by means of examination and coursework. Individual module leaders will inform students of the specific procedures for assessing work in their module. This information will be supplied at the commencement of the module.

2. Submission Procedures
Students must submit each assignment to the module leader on or before the deadline set for each module. Student should keep a copy for their own records. The assignment will be date stamped. It is the student's responsibility to ensure that the assignment is registered in this way.

3. Class Participation
Discussion questions will be provided in advance by each module leader. Outside class discussions of these questions with other students are encouraged. It is expected that every student will be prepared to answer questions on every lecture. The readings and the book typically highlight a particular idea or model. We expect the students to share their own views and opinion on the reading materials.

4. Penalties for late submission
Individual and group assignments submitted after the specific deadline for each module, without authorization from the programme director, will have an automatic penalty of 10% deducted from the total mark awarded per working day that the assignment is late.
With this in mind it is essential that any problems with assignments be discussed with the module leader as soon as possible. If you are likely to require an extension on health, personal or any legitimate reason you should see the programme director before submission deadline. Extensions must be agreed 24 hours in advance of submission date.

5. Group assignment and presentations
Each module will include a piece of group work. A group of two to four students will write a report and present it in class. Keep the report short and hand it in on time.

6. Quality of scripts
Project reports and assignments must be submitted in good academic/business style, including references and a bibliography. Reports must be well structured and include an executive summary and sources of information as appropriate. Detailed information (survey results, customer lists etc) should be included in appendices. All work should be typed and include a cover page.

7. Academic integrity (School of Graduate Studies Calendar 6.1)
Plagiarism is a very serious offense. The University has established a clear plagiarism policy that you must consult; you can find it at: http://www.mcmaster.ca/senate. From the code of behavior on graduate academic: *it shall be an offence for a student knowingly:*
to plagiarize; the falsification or fabrication of research results; the submission of work that is not one's work or for which previous credit has been obtained; aiding and abetting another student's dishonesty; giving false information for the purpose of gaining admission or credits; and forging or falsifying McMaster University documents.
The Senate Academic Integrity Policy specifies the procedures to be followed in the event that a student is charged with academic dishonesty. Copies may be obtained from the office of Academic Integrity or from the website at: http://www.mcmaster.ca/senate

If you have difficulty viewing the University's Policy, please let us know and we will provide you a printed copy.

ENTERPRISE DEVELOPMENT LAB FACILITIES

The XCEEi Enterprise Development Lab is located on the fifth floor of the Engineering Technology building, ETB. The administrator is Deborah Smaluck whose primary responsibility is to make sure this lab runs efficiently and effectively for the benefit of the students and staff.

1. Unit Administrator
The administrator can be reached in her office, ETB 511. Dr. Rafik Loutfy, the Centre Director, can also be reach in ETB 513 to assist, if a problem arises.

2. Access
The Engineering Technology Building is normally open from 7:30 am to 10:00 pm Monday to Friday. Access to the building outside these times is via proximity card which you will be given by the administrator. Under no circumstances are you to let anyone else use your proximity card. In the event that you inadvertently lose your card, you must let the administrator know immediately so that the card can be deactivated.

On occasion you will want to bring visitors into the EDL, please ensure you escort them out of the lab, and during closed hours you must escort them off the premises. This is necessary for security and safety, as well as being good practice. Please ensure you tell the administrator of all visitors in advance.

3. Workstations
Each student will have access to desk space. In addition phones and PC's will be made available. However, this will not be on a dedicated basis as there will be need for sharing of phone lines and PC's. Students are encouraged to bring their own laptop as there will be internet hook-up and power outlets. Each student will however have their own dedicated lockable set of under-desk drawers allocated to them.

Each of the Centre's PCs will run on XP Pro. MS Office 2007 software is available on each PC as well, MS Project, Xerox DocuWorks 5 and Mindjet. The computers are networked and you will be provided with an account and password for this purpose. No software should be installed without the permission of XCEEi. Doing so could invalidate the maintenance and support agreement in place. If you do feel you need to load additional software for your project please put your case in writing to your enterprise advisor.

Each student has a personal account on the XCEEi server which is backed up on a nightly basis. It is advisable not to store your data on the PC's hard drive because it is not a secure storage medium.   Unique to this program, XCEEi also provides web-based Docushare for student use. All students have accounts on Docushare and all MEEI course material resides in course accounts on Docushare.

Telephone sets with partial 905, and full 519, 613 and 416 area code access are shared among each of four work spaces. You will need a PIN code to make long distance calls; this will be issued to you, upon request. Telephone usage is monitored and the costs for each extension number logged against your individual project.

4. Meeting facility
A conference table with a speaker telephone is available to conduct group meetings within the School of Engineering practice facility. Please feel free to use it for your meetings but book it in advance through the administrator. If you have a meeting that requires refreshments please let the administrator know as soon as possible. When you have finished your meeting please leave the room in a clean and orderly fashion, ready for next user.

As the year progresses some of you will be getting to market with your project. In addition some of you will be working on projects with industrial sponsors. We wish to convey a professional image to any visitors to the

Enterprise Development Lab. Please bear this in mind and keep the lab in tidy, clean and in professional condition.

5. Audio-Visual Equipment
The following audio-visual equipment is available for use within the Lab:
- InFocus portable data projector
- Laptop computer
- OHP
- Flipcharts and whiteboards

In the event that we find that we regularly have insufficient audio-visual equipment of a particular type we will purchase extra sets, budget permitting. Please report any faults to the administrator.

6. Photocopier/Printer/Fax
A Xerox WCP 3545 photocopying machine operated on pass codes will be made available to MEEI students in the main office. The administrator will issue pass codes on an individual basis. Photocopying usage under each code is logged and allocated to your project costs. The WCP 3545 operate as a color laser printer and a fax machine as well.

Supplies will be stored under the photocopier. Please refill the paper trays as required.

7. Knowledge Management Solution
The EDL will be equipped with the latest Knowledge Management Solution software. Including:

 Knowledge delivery & transformation software –
- *FlowPort:* Securely delivers documents in the desired format to multiple locations and integrated systems, and
- *DocuWorks:* Provides the ability to bring together documents of multiple formats and type

Knowledge sharing software –
- *DocuShare:* A web-based tool used for collaboration, storage and management of documents

All students will be trained on the use of the above software that should help them manage their knowledge intensive projects

8. Health Safety and Security
There is a first aid box located in the lab which contains plasters, antiseptic, wipes, bandages etc. Please notify the administrator of any serious injury so that this can be reported to the University administrator.

It is the responsibility of everyone using the Enterprise Development Lab to ensure that it is operated in a safe and secure manner. The benefit to us of this is obvious. The administrator has a specific responsibility to ensure that correct standards of safety and security are applied, please take notice and follow the administrator's instructions on safety and security, as well as applying your own common sense.

If you have not already done so, you will be required to complete McMaster's W.H.M.I.S. - Workplace Hazardous Materials Information System course. Provincial legislation requires that all people employed in a workplace where hazardous materials are used, attend training sessions on the W.H.M.I.S. A schedule of sessions will be posted.

STUDENT REPRESENTATION AND SUPPORT

Both the XCEEI and the Faculty of Engineering are keen to ensure that your time with us is as stimulating, valuable and enjoyable as possible. As a consequence, we seek to provide opportunities for students to have input into the design and delivery of programmes. This takes a number of forms:

1. Student Input to Course Design and Operations
At the end of each module students will be asked to complete a module evaluation form and asked to comment on both content and delivery. The feedback provides an important means of maintaining and improving the quality and relevance of all our modules.

2. Informal Student Study Groups
XCEEI staff actively encourages the formation of informal student study groups. They are useful both as a means of peer support and can significantly enhance understanding and learning. The meeting area in the Enterprise Development Lab is available and may be used for group meetings.

3. Personal Details
Please advise the administrator in the Enterprise Development Lab of the following:

Change of address: please ensure that you notify us of any change of address, phone number or e-mail as soon as possible, even after completing your programme. This will enable us to keep you informed of our activities and to ensure that you can take full advantage of the network we are creating.
Change of modules: whilst changes in your advanced engineering modules are matter for your technical advisor, it is essential for us to know that such changes may be taking place as the changes may have implications for your enterprise work, especially your enterprise project.

Sickness and absence: advising of absence through ill health or for personal reasons.

ACADEMIC YEAR 2009/10* KEY DATES

First Term:
September 8 – December 4   Teaching Period

Second Term:
January 8 to April 11   Teaching Period
April 14 to April 18   Teaching/Examination

Third Term:
May 1 to July 28   Teaching Period
August 2 to August 5   Teaching/Examination

A timetable of assignment deadlines will be issued at the beginning of each term.
*Academic year 2009/10 commences at September 8, 2009.

SESSIONAL DATES 2009-2010

Deadline Dates for Graduate Programs	Fall Term (1) (Sept-Dec 2009) (w & x)	Winter Term (2) (Jan-April 2010) (y & z)	Summer Term (S) (May-Aug 2010)
On-Time Registration	July 9-July 31	December 3-December 22	April 8-April 29
Late Registration	August 1-September 14	December 23-January 11	April 30-May 10
Final Dates to Add Courses:			
— Full Courses	September 30		
— Half Courses or Quarter Courses (1w or 2y)	September 30	January 29	May 21
— Quarter Courses (1x or 2z)	November 6	March 5	
Final Dates to Delete Courses (NOTE: All courses on a student's record after these dates will require a grade):			
— Full Courses	January 11, 2010		
— Half Courses	October 16, 2009	February 12	June 11
— Quarter Courses (1w or 2y)	September 30, 2009	January 29	
— Quarter Courses (1x or 2z)	November 13, 2009	March 19	
Final Dates to Submit Grades:			
— Full Courses		May 3	
— Half Courses	January 11, 2010	May 3	August 13
— Quarter Courses (1w or 2y)	November 6, 2009	March 5	
— Quarter Courses (1x or 2z)	January 11, 2010	May 3	
Final Date to Submit Results of Incomplete (INC) Grades for Previous Term With Permission of Associate Dean	March 19, 2010	July 16	November 19
UNDERGRADUATE DATES			
Undergraduate Classes Begin	September 10	January 4	May 3
Undergraduate Classes End	December 4	April 8	June 18
Undergraduate Exam Period	December 8-22	April 10-28	
Mid-term Recess		February 15-20	
Holidays	October 12	April 2	May 24, July 1, August 2
	Fall 2009	**Spring 2010**	**Fall 2010**
CONVOCATIONS			
Fall – All Faculties	November 20		November 19
Spring – Faculty of Health Sciences (except Nursing)		May 21	
Spring – All Other Faculties (including Nursing)		June 7 to June 11	
THESES			
Final Date to Submit Ph.D. Theses to Graduate Studies (Prior to Defense)	July 17	February 1 (Health Sciences) February 22 (All others)	July 23
Final Date to Submit Master's Theses to Departments (Prior to Defense)	August 21	March 19	August 20
Final Date to File Theses with Graduate Studies for Binding and Complete Degree Requirements			
— Faculty of Health Sciences	September 28	April 7 (except Nursing)	September 28
— All Other Faculties	September 28	April 28 (including Nursing)	September 28

McMaster University School of Graduate Studies Calendar 2009-2010

APPENDIX B

List of Events where MEEI students participated

Workshops and training sessions provided to the MEEI students

Networking Opportunities Available to all	Method	Event
Golden Horseshoe Venture forum	Networking BreakfastRoyal Botanical Gardens	Networking Breakfast --three MEEI students presented their projects via elevator pitch
DeGroote School of Business	Networking Breakfastat McMaster University	Hosted by Business Student Group about Sales
Waterloo entrepreneurial network- Communitech	planned entrepreneurevents – Kitchener/Waterloo	'Entrepreneurship Week'
Communitech membership for XCEEi	seminars/workshops/ roundtables/networking	all Communitech events
ITAC--membership for XCEEi		
Innovation Café	roundtable discussionMcMaster	multiple sessions
in-house seminars	planned events for our Orientation week	**example-Eugene Roman**, CIO, OpenText -Alex Manu, OCAD

Examples of major competitions that Master of Engineering Entrepreneurship and Innovation students have participated in:

TiEQuest Business Plan competition
 2007 -- Omar Lalani, Navi-C, finished 3rd out of approx. 200 participants
 2008 -- Nimesh Bahl and Cristian Nunez, Liquid Fibre Displays won the competition
 2009 -- Kelly Curry, Swingature, finished 3rd in the competition

McMaster Innovation Showcase
June 2008 – Tim Pryor was the overall winner

Hamilton-Wentworth/Halton Chapter of the Ontario Society of Professional Engineers
February 2009, Tim Pryor for Digital Dash and Kelly Curry for Swingnature were co-winners of the award.

TECNet Innovation Fair
Each year for the past 3 years, 5 projects from the MEEI program have captured awards in this Innovation Fair.

APPENDEX C
Statement from Chief Librarian

To be obtained.

APPENDIX D

List of Entrepreneurship & Innovation Courses

_____

*720 / Entrepreneurial Processes and Skills (Module 1) / R. Loutfy
This module course will develop an understanding of the fundamentals of sustainable businesses.
Students will develop an
awareness of and skills in innovation and entrepreneurial behaviour. Emphasis will be placed on becoming a
more effective team player, becoming more aware of one's own learning style and entrepreneurial orientation,
and understanding the process of business idea generation, development and evaluation.

*721 / Breakthrough Technology Venture Development (Module 2) / D. Potter
This course will introduce students to the concepts of new venture creation, and will provide an understanding
of the responsible use of capital, basic capability in the process and techniques of market research, and
appreciation of intellectual property value and protection issues. Learning outcomes include understanding the
process of business planning and valuation and understanding the main types of risk that affect the nascent
entrepreneurial venture.

*722 / Positioning and Shaping an Enterprise (Module 3) / Staff
Learning outcomes of this module course will include an understanding of the role of technology-based
business in the
economy; understanding the financial dimension of the venture; understanding the nature of capital investment
and role of banks and VC industry; understanding business and managerial accounting; appreciating
operational and resource issues; understanding project management and how the innovation process may be
managed; understanding how manufacturing units may be set up and managed; and developing the ability to
formulate an exit strategy.

*723 / New Venture Business Strategy (Module 4) / T. Corr
The focus of this course is understanding the new venture value proposition and how to market it, including
understanding market
dynamics and competitive forces facing new venture and strategies to create customer value, understanding
the role of IT infrastructure in driving the enterprise productivity, and understanding e-business as a channel.

*724 / Taking a New Venture to Market (Module 5) / S. Treiber
The final module course in the program will address the skills and knowledge needed to launch and sustain the
new venture. The
module will provide an understanding of how to manage the new venture strategically for growth and
sustainability; how to put together a high performance team; the role of value-chain management and timing;
and the critical factors that contribute to business survival and longevity.

APPENDIX E

Application Reference Evaluation Form

EVALUATION

**CONFIDENTIAL
REPORT ON APPLICANT
FOR ADMISSION TO
MEEi PROGRAM**

McMaster University
ENGINEERING

PLEASE RETURN TO:

Administrator, MEEi Admissions
School for Engineering Practice
ITB-106
McMaster University
Hamilton, ON L8S 4L7

To be completed by the applicant (please print or use typewriter)
Surname   Given Names

To the Referee:

The above named student has applied for admission to McMaster and requests that you provide information on his/her potential abilities as a Master of Engineering in Entrepreneurship and Innovation (M.Eng.) student. We rely considerably on the statements made by the referees and are most grateful to you for your assistance. If you prefer to send a letter of reference which covers the questions listed below rather than utilize this form, that will be quite acceptable.

Please type or print clearly in black ink. Attach additional sheets if necessary.

1. How long and in what capacity have you known the applicant? Please be specific. _____

_____

_____

_____

_____

_____

2. What are the applicant's most outstanding abilities or characteristics? _____

_____

_____

_____

_____

_____

3. What are the applicant's most noticeable weaknesses? _____

_____

_____

_____

_____

_____

Health Management

The Masters in Health Management program is delivered through a partnership between McMaster's DeGroote School of Business and School of Rehabilitation Sciences (Faculty of Health Sciences) and is offered through distance education on-line, on a part-time basis, and designed specifically for health professionals who are currently employed in a clinical and/or management capacity in any health care sector in Canada or internationally.

Many health professionals seek advanced knowledge and skills in health management as their careers progress. The complexity of the contemporary health care environment and the new demands made upon clinicians has made it necessary for practitioners seeking to move into management to acquire additional knowledge and skills that have evolved since they graduated from their baccalaureate programs.

The Master of Health Management (MHM) provides regulated health professionals with a combination of core management skills (accounting, finance, marketing, human resource management etc.) and a broad understanding of the Canadian health care policy development and service delivery environments (health system design, health policy analysis, and evidence based decision-making).

The program curriculum includes graduate course work and critical analysis and synthesis of management research to ensure the development of knowledge and skills for management of health care programs and organizations. By bringing together graduate courses from business and health care, the Master's program prepares graduates to work effectively in health management positions in the future. Students will gain the knowledge, skills and abilities necessary to excel as a middle or senior manager within both the public and private spheres of Canada's health care sector.

The core competencies identified below represent the minimum knowledge and skill expectations students will attain in order to complete the MHM program. These competencies are gained through coursework, self-study, group interaction and other experiential learning activities throughout the program.

1. **Lifelong Learning** (*Understanding, demonstrating and promoting the necessity for continuous learning among professional.*)

2. **Communication Skills** (*Understanding and demonstrating effective communication styles and techniques and use of related technologies.*)

3. **Conceptual Skills** (*Identifying, synthesizing and analyzing information in a coherent and methodical way to advance problem solving and the creation of new information.*)

4. **Awareness of the Political and Healthcare Environments** (*Awareness and appreciation of the complexities and interrelationship between the political and healthcare environments.*)

5. **Organizational Behaviour and Human Resource Management** (*Demonstrate an understanding of how organizations function and human resources plays a key role within organizations.*)

6. **Financial Management** (*Demonstrate an understanding of financial data and related management techniques which support good financial management practices.*)

7. **Research Awareness** (*Awareness and demonstrated understanding of the creation and use of research.*)

8. **Leadership** (*Awareness and demonstration of skills which motivate others to excel within an ethical and supportive environment.*)

Two short residency periods (3-4 days each) will be required of students during their time in the program.

Email: MHM@mcmaster.ca

Fax: 905.524.0069

Website: www.MacHealthManagement.com

Staff / Fall 2010

PROFESSORS

Vishwanath Baba, B.Eng (Madras), MBA (Western Illinois), Ph.D. (British Columbia)

Susan Baptiste, Diploma in OT (UK), M.HSc. (McMaster)

Trevor Chamberlain, B.Sc. (Berkeley), MBA (McGill), Ph.D. (Toronto)

Mary Law, B.Sc.(Hons) (Queen's), M.Sc. (McMaster), Ph.D. (Waterloo)

Patricia Solomon, Dip (PT) (Manitoba), M.HSc. (McMaster), Ph.D. (Waterloo)

Paul Stratford, Cert. (PT) (McMaster), Dip. (PT) (Mohawk), M.Sc. (McMaster)

Yufei Yuan, B.S. (Fudan, Shanghai), Ph.D. (Michigan)

CLINICAL PROFESSORS

Lynne Geddes, B.Sc. (Western), M.R.E. (Toronto)

ASSOCIATE PROFESSORS

Nicholas Bontis, BA (Western), Ph.D. (Western)

Brian Detlor, B.Sc. (Hon Comp Sci) (Western), M.Sc. (Toronto), Ph.D. (Toronto)

Maureen Hupfer, B.Comm. (Alberta), M.A. (Alberta), Ph.D. (Alberta)

Lori Letts, B.Sc. (Western), M.A. (Waterloo), Ph.D. (York)

Susan McCracken, B.Comm. (Hons) (Queen's), Ph.D. (Waterloo)

Julie Richardson, Dip. (PT) (Dunedin NZ), B.Sc. (Toronto), M.Sc. (Otago), Ph.D. (Toronto)

Debra Stewart, B.Sc. (OT) (Toronto), M.Sc. (McMaster)

David Taylor, B.A. (Hons) (Toronto), M.P.A. (York), Ph.D. (York)

Joyce Tryssenaar, B.Sc. (Western), M.Ed. (Brock), Ph.D. (Western)

Seanne Wilkins, Dip. (PT/OT) (Toronto), B.Sc. (OT) (Toronto), M.Sc. (Toronto), Ph.D. (Toronto)

ASSISTANT PROFESSORS

Catherine Connelly, B.Com (Hons) (McMaster), M.Sc. (Queen's), Ph.D. (Queen's)

Terence Flynn, B.A. (Carleton), M.S. (Syracuse), Ph.D. (Syracuse)

Bonny Fung-Ming Jung, B.Sc. (OT) (Toronto), M.Ed. (Brock), Ph.D. (ABD) (Western)

Christopher Longo, B.A. (York), M.Sc. (Western), Ph.D. (Toronto)

Teal McAteer, B.Comm (Queen's), M.I.R. (Toronto), Ph.D. (Toronto)

Glen Randall, B.A. (Hons) (McMaster), M.A. (McMaster), M.B.A. (McMaster), Ph.D. (Toronto)

Patricia Wakefield, B.Sc. (Alberta), M.Sc. (Cornell), M.P.A. (New York), DBA (Boston)

ASSISTANT CLINICAL PROFESSORS

Constance Mitchell, B.Sc. (OT) (Queen's), M.Sc. (OT) (Dalhousie)

Nancy Plews, Dip. (PT) (Mohawk), B.HSc. (McMaster), M.P.A. (Queen's)

The general regulations for this degree appear under the Regulations for Master's degrees near the beginning of this Calendar.

The admission requirements for the Masters in Health Management are:

The admission requirements for the Masters in Health Management include:

1. Regulated health professional (evidence of registration in the applicant's professional affiliation in his/her own province/country). Examples of regulated health professionals include audiologists, dieticians, nurses, occupational therapists, psychologists, physiotherapists.

2. Graduation with a minimum of a B+ average from a 4-year baccalaureate health professional program.

3. Two academic and two clinical/work place related references.

4. Written application outlining career plans, research interests and suitability for the Master of Health Management Program.

5. If the applicant's native language is not English, an official copy of their TOEFL score, or other evidence of competency in English. A minimum TOEFL (iBT) score of 92 (580 on the paper-based TOEFL test or 237 on the computer-based TOEFL test) is required.

Candidates must:
1. Complete with at least B- standing, six (6) graduate half courses. Five courses, HM *700, *705, *706, *707, *708 are mandatory.

2. Completion of one elective course. This may be chosen from among on-campus (e.g. Rehabilitation Science Program or Master of Business Administration Program), other distance education courses, including those offered by other universities, and may be geared towards the particular interests of the student. A list of pre-approved courses for electives has been created (see the website) and approved by the Associate Deans of Graduate Studies (Health Sciences and Business).

3. Complete HM 730 scholarly paper to demonstrate integrative thinking in the study of health management at a general and abstract level.

Courses
Courses marked with an asterisk (*) are half courses.

HM 700* **Health Systems and Policy**
This course is the introductory course for the Master of Health Management program. It will provide students with an understanding how the Canadian health care system is organized as well as how services are financed and delivered. This will be done through an assessment of the Canada Health Act and various pieces of related provincial healthcare legislation. Discussions will include an exploration of the for-profit and not-for-profit mix of services within Canada. In addition, students will be exposed to the principles of evidence-based decision-making and various health policy analysis tools. Current issues and trends in health policy (both within Canada and internationally) will serve as cases to which students apply those tools.

HM 705* **Evaluating Sources of Evidence for Management and Evaluation**
ThIs course is designed to provide students with the knowledge and skills to understand and critically evaluate sources of evidence used to support decision making within a health care environment. Students will develop knowledge about the principles of evidence based decision-making, searching the literature, and critically reviewing research methods and analyses. The course emphasizes the development of skills to apprise, synthesize and communicate evidence in order to use it within management decision-making.

HM 706* **Health Management Foundations I** *(pending GPCC approval)*
This course will enable students to develop knowledge and skills in related to management principles and practices involved in the delivery of health care products and services in for profit and not for profit environments. The impact of cultural and ethical issues on workplace structure will be examined in detail. Students will build skills in the selection and development of marketing and communication strategies. Course content includes: human resources; legal issues; negotiations; organizational behaviour; and marketing principles and theories and their application in health care management. Evaluation methods will include participation in online discussions, analytic review of health management marketing topic, and major paper focused on a foundational issue in health management.

HM 707* **Health Management Foundations II** *(pending GPCC approval)*
Through this course, students will gain knowledge about the fundamental concepts and practical issues related to accounting and finance and their uses in planning, decision making and control in health care management. Skills in the basics of managerial finance and managerial accounting, budgeting and forecasting will be developed through discussion, case studies and course assignments.

HM 708* **Leadership in Health Organizations** *(pending GPCC approval)*
This course explores principles, practices, trends and issues of leadership in health management settings. Current theories of leadership with attention to styles, practices, tasks and models will be covered. Participants will be encouraged to reflect on and analyze their own leadership experiences in light of theories studied. Through the

interplay of theory and practical application, participants will gain a deeper appreciation for the requirements, responsibilities, and consequences of effective leadership.

HM 730 / **Scholarly Paper** *(pending GPCC approval)*
This full course is designed as an opportunity for graduate course based students to demonstrate, in writing, their ability to integrate ideas that reflect current knowledge in areas of health management practice, education, research, and/or policy. The scholarly paper is to demonstrate integrative thinking at a general and abstract level. A student will identify a topic, and in consultation with a faculty member with expertise in the area develop a proposal that is individualized to the student's area of interest. The student will then develop the paper under the guidance of a faculty member. The paper must be 25 to 30 pages, excluding references and appendices. The paper does not typically involve the collection or analysis of primary data or the conduct of research with subjects. It is a scholarly essay, not a thesis.