Master of Science in Innovation and Technological Entrepreneurship

Program Description
The Master of Science in Innovation and Technological Entrepreneurship consists of ten courses (30 credits), including 4 core courses (12 credits), 4 elective courses (12 credits, 6 of which must be in Engineering and/or Science) and a 2 course (6 credit) practicum. Each student will participate in the development and delivery of a team capstone project (through the 2 course practicum) which will be reviewed by an external professional panel. Proposed course titles are presented below in Table 1.

Table 1. Courses in MS ITE Program

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<thead>
<tr>
<th>Requirements</th>
<th>Courses</th>
<th>Department</th>
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<tbody>
<tr>
<td>Program Core 12 Credits</td>
<td>ENTR.6500 -Innovation &amp; Emerging Technology</td>
<td>Entrepreneurship</td>
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<td>4 courses</td>
<td>ENTR.6300 -Market Research for Entrepreneurs</td>
<td>Entrepreneurship</td>
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<td>ENTR.6350 -Financing Innovation &amp; Tech. Ventures</td>
<td>Entrepreneurship</td>
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<td>ENTR.6450 -New Product Development</td>
<td>Entrepreneurship</td>
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<td>Program Electives</td>
<td>ENTR.6400 -New Venture Creation</td>
<td>Entrepreneurship</td>
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<td>12 Credits 4 Courses</td>
<td>MIST.6350 -Project Management or</td>
<td>MIS</td>
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<td></td>
<td>MECH.5750 –Industrial Design of Experiments</td>
<td>Mech. Engineering</td>
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<td>MECH.5710 –Collaborative Engineering and Quality</td>
<td>Mech. Engineering</td>
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<td>ENTR.6550 -Corporate Entrepreneurship</td>
<td>Entrepreneurship</td>
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<td>MGMT.6400 -Managing Entrepreneurial Teams</td>
<td>Management</td>
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<td>PLAS.5900 -Intellectual Property</td>
<td>Plastics Engg</td>
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<td>PLAS.5370 -Business Law for Engineers</td>
<td>Plastics Engg</td>
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<td>PUBH.6070- Healthcare Information Systems</td>
<td>Health Sciences</td>
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<td>MIST.6300-e-Business</td>
<td>MIS</td>
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<td>MKTG.6010-Customer and Markets (pre-req</td>
<td>Marketing</td>
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<td>ENTR.6300)</td>
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<td>MSIT.5650-Cloud Computing</td>
<td>Computer Science</td>
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<td>ENTR.6700-Global Entrepreneurship</td>
<td>Entrepreneurship</td>
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<td>ENTR.5650-Technological Entrepreneurship</td>
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<td></td>
<td>•Special Topics Additional electives with Dept. approval</td>
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<td>Program Capstone 6</td>
<td>ENTR.6800 - New Venture Planning Capstone I</td>
<td>Entrepreneurship</td>
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<tr>
<td>Credits 2 Courses</td>
<td>ENTR.6810 - New Venture Implementation Capstone II</td>
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Contact:
Manning School of Business, Graduate Programs Office
Ashwin Mehta 978-934-2728 or MSITE@uml.edu
Admissions Requirements

Target Audience
The Program will be offered to engineering, science and select business graduates as a 5th year program (the University’s Plus-One program) and to working professionals with an appropriate undergraduate degree in business, science, technology or engineering.

Working Professionals
Admissions to the program will be determined based on an overall review of the following applicant materials: undergraduate degree and performance in science, engineering or business (other areas will be considered if the applicant demonstrates significant work experience in a technical field), GMAT or GRE score, three letters of recommendation (professional and academic) and a letter describing the applicant’s professional goals and how earning a MS will assist in their professional development. For applicants from non-English speaking countries, a minimum score on the Test of English as a Foreign Language (TOEFL) of 600 (paper-based) or 100 (Internet-based) must be obtained.

Plus-One Program (formerly the Accelerated Bachelor’s to Master’s Program)
The Plus-One Program option offered by the College of Management is an accelerated program offered to encourage outstanding undergraduate students in engineering, science and business to continue study at the graduate level. Undergraduate students in these majors (i.e., science, engineering or business), who have a GPA of 3.00 or better at the end of their junior year must apply for this program before they complete their undergraduate graduation requirements. Students who plan to apply to this program must meet with the M.S. program advisor by their junior year to discuss any additional course requirements.

General eligibility guidelines for admissions to a UML Accelerated Bachelor’s to Master’s Programs can be found online at http://www.uml.edu/catalog/graduate/degree_requirement/bachelors_masters.htm.
Course Descriptions

Core Courses

**ENTR.6500 Innovation and Emerging Technologies (3 credits)**
This course examines technological innovation and its relationship to value-creation and business strategy. Emphasis is placed on emerging scientific and technical innovations and the opportunities and challenges they present to both existing businesses and new venture entrepreneurs. The overall goal of this course is to help you to understand, appreciate and learn to manage the technology innovation process. Students examine innovation strategies, planning models, evaluation models, licensing and the commercialization process required to launch new businesses around innovative products and technologies.

**ENTR.6300 Market Research for Entrepreneurs (3 credits)**
In this course students will learn and apply various marketing research techniques that will enable them to succeed as entrepreneurs. Some of the topics we will cover include: assessing customer needs, estimating market demand, deciding the features of the proposed product/service and the price that would be most attractive to their target market etc. The course will provide students with an overview of key marketing concepts, an understanding of the statistical methodology behind the market research techniques and practical application of the techniques via cases and projects.

**ENTR.6350 Financing Innovation and Technology Ventures (3 credits)**
This course focuses on strategies for financing innovation and new technology ventures both within a firm and on a stand-alone basis. Topics covered will include: different types of business organizations; different sources of funding including internal sources and external source such as angel investors, venture capitalists, etc.; short-term and long-term financial planning and forecasting; business valuation; term sheet negotiation and exit strategies including mergers and acquisitions and IPOs. Each aspect of the course will be covered within the context of a business plan and venture life-cycle.

**ENTR.6450 New Product Development (3 credits)**
This course will enable students to understand the complexities involved in new innovation and technology-based product development. Through examples and exercises, students will be exposed to such topics as creative problem solving, customer/suppliers/partners involvements and inputs processes, integration among all functions, building and managing cross functional teams, rapid prototyping and development, creating a learning organization and measurements.

Elective Courses

**ENTR.6400 -New Venture Creation**
This course is designed to help students to identify, evaluate, and obtain control over opportunities that can be exploited by starting new companies. It essentially focuses on entrepreneurship as a generic activity. It explores the opportunities and challenges faced by individuals starting up new ventures and the probable paths of career development for the students pursuing entrepreneurship. Thus, for those who may be interested in starting or running a new business in their lives, this class will provide an essential foundation for the process, skills and resources required as well as the opportunities available to the young entrepreneurs.
**MIST.6350 Project Management (3 credits)**
This course will focus on managing innovation and technology projects and the critical role that a project manager plays in successful execution. Topics included in the course are: project planning, deliverables, managing quality, change management, documentation, communication, risks management, project team and human resource management approaches and creating and managing expectations.

**ENTR.6550 Corporate Entrepreneurship (3 credits)**
This course focuses on entrepreneurship in established companies. Corporate Entrepreneurship (CE) is a process by which companies adopt a conscious strategy to encourage creativity, innovation, outside-the-box thinking, experimentation and risk taking. As a result, companies promoting and implementing CE strive for competitive advantages in rapidly changing global markets. The course will cover components of CE, developing & implementing CE strategies and managing CE.

**MGMT.6400 Building & Managing Entrepreneurial Teams (3 credits)**
A critical element of success in the launch of new products, services and companies is the composition and experience of the team members. This course examines the composition, development and lifecycle of entrepreneurial teams within the context of startups and existing corporations. Students will develop an understanding of the need for diverse experiences and skills among team members along with an understanding of how teams change as entrepreneurial processes progress. A particular emphasis will be placed on improving students communications and collaboration skills in a cross-functional team context. Students will also explore evolving open collaborative approaches employed by companies to accelerate innovations by using customers, suppliers, partners and other organizations outside the four walls of a company.

**ENTR.6880 Special Topics in Entrepreneurship & Innovation (3 credits)**
Topics of current interest in Entrepreneurship, Innovation and Technology Management. Subject matter to be announced in advance.

**PLAS.5370 Business Law for Engineers (3 credits)**
Employment agreements, including ethical work considerations, non-compete provisions, trade secrets, assignment of rights to inventions; contracts including types, terms, warranties, risk of loss, remedies of breach; legal aspects of product design, prototyping and testing; materials, product & equipment defects and liability; intellectual property including patents, trade secrets, trademarks, copyright, accounting for intellectual property, licensing; business torts, damages & remedies including environmental pollution, conversion, breach of contract, injunctions.

**MECH.5760 Engineering Project Management (3 credits)**
Skills are developed enabling engineers to be effective decision makers and technical leaders in an environment where technology management, business operations and strategies for contract compliance are critical to achieving competitive advantage. Elements of the Project Planning and Control System are presented along with analytical methods important for maintaining Projects on schedule and within budget.

**PLAS.5900 Survey of Intellectual Property (3 credits)**
A review of patents, trademarks, copyrights and their application for protection of technology in the plastics industry. Other topics to be considered will be employee rights/non-competition agreements, foreign patent protection and technology licensing.
MECH.5750  Industrial Design of Experiments
This course will familiarize the students with the concepts of Robust Design and Statistical Design of Experiments (DOE) as applied in the design and manufacturing of new products. The course will discuss classical as well more current methodologies of DOE including Full Factorial, Fractional Factorial, Taguchi, Central Composite and D-Optimal Designs. The course will also provide for different methods for analysis of results including ANOVA, Signal to Noise, and Sampling techniques. Example experiments using industrial cases studies and the manufacturing laboratories at UML will be used.

MIST.6300-e-Business
This course provides a foundation on digital commerce and e-business for MBA students. It will cover both technological and managerial aspects of managing e-business operations in either a traditional or pure "dot.com" organization. Issues covered include interactive marketing and market-spaces, agent-based commerce and intelligent markets, electronic shopping carts, user interface issues, EDI transaction via Extranets, database interfaces, personalization and targeted communications, security, encryption, and payment systems, privacy and intellectual property.

PUBH.6070 Healthcare Information Systems Credits
This course provides health care professionals with a practical understanding of health care information systems sufficient to work effectively with and support information systems design, development and implementation within a variety of health care settings. The course includes analysis and discussion of actual case examples. (Fall, Spring, Summer)

MKTG.6010-Customers and Markets (pre-req 62.6300)
Pursues the development of comprehensive and integrated marketing plans using industry/competitor analysis, market value chains, and forecasting. An emphasis is given to business-to-business marketing situations which require an in-depth analysis of the firms' complex organizational behavior and evolving buyer-seller relationship.

MSIT.5650-Cloud Computing
This course starts with an overview of modern distributed models, exposing the design principles, systems architecture, and innovative applications of parallel, distributed, and cloud computing systems. The course will focus on the creation and maintenance of high-performance, scalable, reliable systems, providing comprehensive coverage of distributed and cloud computing, including: Facilitating management, debugging, migration, and disaster recovery through virtualization. Clustered systems for research or ecommerce applications. Designing systems as web services. Principles of cloud computing using examples from open-source and commercial applications.

ENTR.6700-GLOBAL Entrepreneurship
This course discusses state of global entrepreneurship and the opportunities for it. It will cover different forms of global entrepreneurship, influences of macro forces and factors for global entrepreneurs’ consideration. The course will offer a structured approach to thinking and creating entrepreneurship beyond domestic markets and operations. It will present entrepreneurship framework, case studies, group projects and connections with global entrepreneurs to understand “real-life global entrepreneurship”.

ENTR.5650-Technological Entrepreneurship
This course is designed to help master's level students, often from fields outside of business, understand how technological and social innovations lead to new businesses and how those are created, funded, governed, and grown.
Capstone Experience

*ENTR.6800 New Venture Planning Capstone I (3 credits)*
*ENTR.6810 New Venture Implementation Capstone II (3 credits)*

These two capstone courses focus on technology commercialization, business planning and initial incubation of an early-stage business by project teams; and, development of an investment proposal to launch a new business. Students will be exploring, identifying and analyzing the path “from Idea to Market” for technology and research projects. They will evaluate selected technology and research projects for commercial applications, explore different options available to productize & introduce to market, and, where appropriate, complete a new venture business plan, and potentially launch or participate in launching a new business. The course will be offered as a continuous course over two consecutive semesters, requiring students to actually develop these commercialization projects. Each Team will be assigned to a faculty member who will instruct and guide them throughout the capstone experience.