Master of Engineering in Technical Entrepreneurship

Lehigh's one-year, 30-credit, full-time professional Master's program (M.Eng.) in technical entrepreneurship helps young entrepreneurs to develop an entrepreneurial mindset through a process we call "Learn by Doing, Learn by Making and Learn by Launching." Entrepreneurial minded students from any undergraduate major are encouraged to apply. Students in the program learn by experiencing the idea-to-venture process in an educational environment that's features a dedicated curriculum offered by a dedicated faculty in a dedicated, intellectual property secure maker space. The business community -- from young start-ups to the Fortune 500 -- recognizes the need for curious, creative and innovative young minds with the skills to lead and manage product development teams to create social and economic value. Graduates of the TE MEng program will find themselves well-positioned to take on complex product development roles and assignments in both large and small companies.

Graduate TE Course Sequence

The TE academic calendar begins with the start of the second summer session with 5 credits. Students complete 10 credits each during the fall and spring semesters and complete their 30 credits with the final two courses during the first summer session of the following year.

Students complete five credits in the second summer session, ten credits in the fall, ten credits in the spring and then five credits in summer session 1.

First Year

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<th>Second Semester</th>
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<td>TE 301</td>
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<td>TE 407</td>
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Second Year

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Total Credits: 30

Further information can be obtained from: http://www.lehigh.edu/~innovate/

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Courses

TE 211 Capstone Design Projects-1 3 Credits
Students work in cross disciplinary teams on conceptual design projects with realistic constraints including marketing, financial and economic planning, and economic and technical feasibility including industrial, business and engineering standards for new products. Teams typically work on projects from industry or entrepreneurial start-ups. Oral presentations and written reports.

TE 212 Capstone Design Projects-2 2 Credits
Students work in cross disciplinary teams on the detailed design, including fabrication and testing of a prototype following industrial, business and engineering standards for the new products or processes designed in Capstone Design Experiences-1. Additional deliverables include a detailed production plan, marketing plan, and base-case financial models. Teams typically work on projects from industry or entrepreneurial start-ups. Oral presentations and written reports.

Prerequisites: TE 211

Attribute/Distribution: ND

TE 250 (ENTP 250) Systematic Creativity Techniques 3 Credits
ENTP 250/TE 250 -- Systematic creativity methods including anthropological research, painstorming, bisociation, the Kano model, trimming technique, DeBono's Six Hats technique, biomimicry, lateral benchmarking, Blue Ocean Strategy, & the art of tinkering, along with other innovation methods. This course includes hands-on labs, individual & team projects, & the creation of a creativity portfolio. Open to students in any college and major. (ND).

Attribute/Distribution: ND

TE 301 Creativity and Systematic Innovation Methods 3 Credits
Creativity methods, anthropological research, painstorming, bisociation, the Kano model, axiomatic design, the trimming technique, parameter analysis, decomposition, nonlinear design, Taguchi's method, DeBono's Six Hats technique, biomimicry, TRIZ, lateral benchmarking, Blue Ocean Strategy, the art of tinkering and other innovation methods. Hands-on labs, individual and team projects.

TE 302 Methods in Visual Thinking 2 Credits
Visualization techniques, visual thinking and envisioning information as taught by Edward Tufte and others, multimedia tools and methods. Appropriate use of technology as applied to new product development, no programming required.

TE 303 Methods in Prototyping, Modeling and Testing 2 Credits
Generation of mock-ups and looks-like prototypes, electro-mechanical-optical bread-boards design, fabricate, build and test multiple generations of prototypes, computer modeling methods, shop methods, testing, sensors and data collection.

TE 304 (CSB 304, ENTP 304) Software Ventures 3 Credits
Designed from the perspective of a functional leader, this course provides students with a holistic perspective of developing a successful software venture in an interdisciplinary and experiential environment. Students will develop a software-oriented idea concurrent with module delivery that will contain best practices, case studies, and subject-matter experts. Examination will include business model fundamentals, customer discovery, translating requirements to a minimum viable product, agile development, user acquisition, and traction. Prior programming experience preferred, but, not required. Open to any major.

Prerequisites: ENGR 010 or CSE 002 or BIS 111

TE 401 Integrated Product Development (IPD) Process -1 3 Credits
An integrated and interdisciplinary approach to engineering design, concurrent engineering, design for manufacturing, industrial design and the business of new product development. Topics include design methods, philosophy and practice, the role of modeling and simulation, decision making, risk, cost, material and manufacturing process selection, platform and modular design, mass customization, quality, planning and scheduling, business issues, teamwork, group dynamics, creativity and innovation. Case studies and semester-long team projects.

Prerequisites: TE 301 and TE 407
TE 402 Integrated Product Development (IPD) Process-2 3 Credits
Continuation of TE 401, the parallel development of the product, the development of the marketing and manufacturing system, manufacturing and marketing launch, sales, service and customer support. Case studies and semester-long team projects.
Prerequisites: TE 401

TE 403 Entrepreneurial Startup Process-1 3 Credits
Key aspects surrounding company startups, including feasibility analysis, business model development and evaluation, formation of new venture teams, financial forecasts, sources of financing. Readings, financial templates, live case studies and guest entrepreneurs.
Prerequisites: TE 301 and TE 407

TE 404 Entrepreneurial Startup Process-2 3 Credits
Continuation of TE 403, integration of key business components to form and launch your venture: industry analysis, marketing plan and sales strategy; mobilization of the new venture team; operations, including space, legal and insurance consideration; and financial management. Selected topics related to respective venture types (i.e. social entrepreneurship, family business, franchising, immigrant entrepreneurs). Lectures, workshops and guest entrepreneurs.
Prerequisites: TE 403

TE 405 Entrepreneurial Startup Projects-1 2 Credits
Applying the concepts and processes developed in TE 403. Developing your business platform including business model, start-up team, and financial plan to launch and grow your venture.
Prerequisites: TE 403 and TE 302 and TE 303

TE 406 Entrepreneurial Startup Projects-2 3 Credits
Applying the concepts of entrepreneurial startup process, building upon the business model, entrepreneurial team and financing plan developed in TE 405. Developing a comprehensive business plan and investor's pitch, finalize the steps necessary to launch the company and start operations.
Prerequisites: TE 404 and TE 405

TE 407 Intellectual Property (IP) Creation and Management 2 Credits
Intellectual property issues: confidentiality, nondisclosure, agreement not to compete, founders agreements, patents, copyrights, trademarks, trade secrets both domestic and international.
Prerequisites: TE 302 and TE 303 and TE 403

TE 461 Integrated Product Development (IPD) Projects-1 2 Credits
Technical and economic feasibility study of new products. Selection and content of the project is determined by the faculty project adviser in consultation with the student, progress and final reports, oral and posters presentations. Consent of the program director and faculty project adviser required.
Prerequisites: TE 401 and TE 302 and TE 303

TE 462 Integrated Product Development (IPD) Projects-2 2 Credits
Detailed design specification, fabrication, building and testing prototype new products and plan for production, selection and content of the project is determined by the faculty project advisor in consultation with individual students or student teams. Progress and final reports, oral and poster presentations. Consent of program director and faculty project adviser required.
Prerequisites: TE 461 and TE 402