PRACTICE ORIENTED MASTERS PROGRAM (EPOM)

EPOM 400. Leadership and Interpersonal Skills. 3 Units.
This course is designed as an experience based process to increase understanding of Communication, Emotional Intelligence and behavioral based communication needs in the work environment. To increase understanding, students will learn to recognize, manage and leverage these in business relationships as well as in team and group processes to develop effective Leadership style. Students will work in teams to examine the topics from the perspective of team members and leaders and will formulate strategies to reach desired goals or outcomes.

EPOM 401. Introduction to Business for Engineers. 3 Units.
This course provides an introduction to the business environment for practicing engineers. The course emphasizes the interplay between business and engineering in the context of the competitive marketplace (economics), how engineering proposals are evaluated (finance), the relationship between product and customer (marketing), making effective use of micro-disciplinary teams (organizational behavior), and the manufacturing and production process (operations).

EPOM 403. Product and Process Design and Implementation. 3 Units.
The course is taught through a series of lectures, class discussions, group projects and case studies. The course aim is to provide a solid understanding of the many aspects of the engineering design process and the management of technology. The course focuses on the engineering and management activities used to develop and bring to market new products and processes. The first part of the course focuses on the techniques used to develop new ideas, the second part focuses on the management of technology and innovation. Recommended preparation: EPOM 401.

EPOM 405. Applied Statistics for Engineers. 3 Units.
This course provides an introduction to applied statistical methods and their application in engineering. The fundamental methods presented include: graphical presentation methods; probability distributions for attribute and variable data; confidence intervals and hypothesis tests for means, standard deviations, proportions, counts, and distribution shape in the context of one, two, paired, and many samples; ANOVA; regression, and correlation. Introductions to engineering applications will include acceptance sampling, statistical process control, process capability analysis, statistical tolerance intervals, designed experiments, gauge error studies, and reliability. MINITAB and/or R will be used in class; however, students may use whatever software they prefer or have available.

EPOM 407. Engineering Economics and Financial Analysis. 3 Units.
In this course, money and profit as measures of "goodness" in engineering design are studied. Methods for economic analysis of capital investments are developed and the financial evaluation of machinery, manufacturing processes, buildings, R&D, personnel development, and other long-lived investments is emphasized. Optimization methods and decision analysis techniques are examined to identify economically attractive alternatives. Basic concepts of cost accounting are also covered. Topics include: economics criteria for comparing projects: present worth, annual worth analysis; depreciation and taxation; retirement and replacement; effect of inflation and escalation on economic evaluations; case studies; use of optimization methods to evaluate many alternatives; decision analysis; accounting fundamentals: income and balance sheets; cost accounting. Offered as ECSE 407 and EPOM 407.

EPOM 409. Master of Engineering Capstone Project. 3 Units.
This is the capstone course for the Master of Engineering Program providing students with the opportunity to integrate the Program's topics through an intensive case study project. Interdisciplinary teams are assigned a major engineering project that covers the stages from design concept through development to final manufacture, including business and engineering decision making to maximize market penetration. Topics also include safety, environmental issues, ethics, intellectual property, product liability and societal issues. Recommended preparation: EPOM 401, EPOM 403, EPOM 405, and EPOM 407.

EPOM 410. Intellectual Property Management and Opportunity Assessment. 3 Units.
The goal of this course is to address issues relating to the commercialization of scientific inventions by exposing graduate students to the challenges and opportunities encountered when attempting to develop meaningful intellectual property from the point of early discovery to the clinic and market. Specifically, this course seeks to provide students with the ability to value a given technological advance or invention holistically, focusing on issues that extend beyond scientific efficacy and include patient and practitioner value propositions, legal and intellectual property protection, business modeling, potential market impacts, market competition, and ethical, social, and healthcare practitioner acceptance. These issues transcend disciplinary boundaries, requiring the integration of expertise in the fields of law, business, and biomedical research disciplines. For instance, comprehending the intricacies involved in the evolution of an upstream product from the lab to the marketplace requires an understanding of intellectual property management, namely the identification of optimal appropriability mechanisms, constructing an intellectual property portfolio (e.g., patents, trademarks, and trade secrets), and leveraging this portfolio in a competitive fashion. An emphasis of this course is to help students understand that intellectual property strategy is business strategy, and that IP is a strategic business asset that can be leveraged to create value and intellectual asset formation in the marketplace.

EPOM 411. Innovation - the Confluence of Need, Requirements and Creativity. 3 Units.
Innovation - the Confluence of Need, Requirements and Creativity: The Purpose of this course is to familiarize students with tools and methods of facilitation necessary to move from a simple idea, to a validated development concept with commercial potential. Drawing from fundamentals of a range of programs, including Stanford's BioDesign, Lean Launch, Requirements by Design and others, the course will lead students through the process of developing detailed perspectives on unmet need, validated design requirements, intellectual property analysis and commercialization fundamentals.

EPOM 412. Technology Transfer and Collaboration. 3 Units.
The overall goal of this course is to address the process of technology transfer. The course will build on an understanding of IP Management and Commercialization activities that follow a new discovery, and examine specific approaches to commercializing technology through the process of technology transfer both in the context of academic research and industry research and development. An overview of the drivers governing relevant industry standards will be discussed, along with specific tools that include sponsored research, licensing, and startup formation. The course will include hands-on assessments of two case studies that present applications of law and policy in the context of collaborative technology development, where each student team will provide a critique and overview of how they would handle the circumstances of the given case. Prereq: EPOM 410.

EPOM 413. Innovation, Strategy & Leadership: Contemporary Approach to Future Growth. 3 Units.
The overall goal of this course is to address the process of innovating in an enterprise context. Outside of the enterprise, global shifts, economic developments and technological evolutions all present opportunities and challenges for innovation-based organizations. Inside the enterprise, company culture, acceptable risk/reward profiles and strategic mindsets will all influence the effectiveness of valuable innovation. Building on an understanding of IP Management and Commercialization activities that follow a new discovery (see, e.g., EPOM 410), and needs-based innovation and design (see, e.g., EPOM 411) this course examines specific approaches and factors related to effectively responding to the challenge of innovation from strategic and leadership perspectives. This course will examine approaches to strategic leadership relative to innovative challenges, building an understanding of successful endeavors, flops that "should have worked" and an embrace of the myriad choices and factors that underlie competitive innovation. The course is three credit hours. During the semester, students will work individually, focusing on issues of the process of structuring innovation, applying tools and methodologies presented during the course. Course leaders and presenters will be drawn from across the university and industry. Analytical and philosophical understanding will be enhanced by hands-on assessments of two case studies that present applications of law and policy in the context of strategic technology innovation and leadership. The goal of each student team is to provide a critique and overview of what factors drove the circumstances and outcomes of the given case. The ultimate objective is to deliver a working understanding the strategic options available when attempting to lead an innovative enterprise through the process of converting innovative potential to strategically competitive solution.

EPOM 420. Data Analytics: Optimization. 3 Units.
This course is an introduction to an operations-research approach to engineering decision-making. Mathematical programming is the selection of the best decision, while satisfying some criterion, from some set of available alternatives. Optimization problems arise in all quantitative disciplines from computer science and engineering to operations research and economics. This course will focus on formulation, solution, interpretation, and implementation of the linear programs (LP), integer linear programs (ILP). These methods are powerful mathematical techniques with a wide range of practical applications in various fields, such as manufacturing, transportation, and supply chain management.

EPOM 475. Technology Marketing Strategy. 3 Units.
High technology products and services are unique in the levels of ambiguity and risk that challenge a manager's ability to craft a marketing strategy. Understanding the customer, reading market trends, creating a compelling vision of value, and launching marketing programs (already foreboding tasks in traditional marketing situations) have a heightened sense of uncertainty in the context of high technology platforms such as nanotechnology and regulated medical devices. This course draws on contemporary ideas in literature by thought leaders in technology marketing. We work though several marketing models and methods in practice today to assist students synthesize and build appropriate conceptual and managerial frameworks for technology marketing practice. Offered as EPOM 475 and MGTE 475.