MANAGEMENT OF TECHNOLOGY (MOT)

MOT 0405 Supply Chain Design **3 Credits**
This course deals with the optimization of processes in a supply chain using analytical techniques and modeling. The term "supply chain" refers to all the resources required in moving material through a network of manufacturing processes, quality assurance measures, maintenance, and customer interfaces to produce, deliver, and maintain a product. These are modeled using simulation of this chain, permitting an analyst to design the supply chain and to predict its performance. Students are taught to create discrete simulation models that will reflect the actual performance of a supply chain, prior to committing investments in inventory, procurement and fabrication. These simulations offer three general benefits: a) may be used to achieve an optimized design; b) may be used in solving production expansion needs; and c) can be used to locate and correct problems in an existing manufacturing system.

MOT 0407 Design of Manufacturing Systems and Processes **3 Credits**
In this course, students will learn the significance and ramifications of "Lean Manufacturing" practices and advantages they provide to a manufacturing company. They will learn how to analyze the cross functional processes and to understand how strategic business objectives are translated into specific actions involving facilities, equipment, new skills, and process improvements that must be achieved. Tactical planning and execution design are introduced using specific analytical techniques including: (1) statistical segmentation of demand, (2) production and inventory considerations of facility and product design, including the impacts of variability, (3) use of statistical segmentation for make-to-stock, make-to-order, and make-to-plan strategies, (4) introduction to replenishment techniques including: level loading, rhythm cycles and considerations for safety and cycle stock, and (5) use of postponement strategies in optimizing inventory control.

MOT 0415 Information Systems **3 Credits**
This course offers insights into the capabilities of modern software and computing systems, allowing prospective technology managers to discriminate between effective and ineffective applications of software and network systems - considerations essential to managing businesses that depend upon efficient data and information processing. The course covers inputs, outputs, storage, transmission media and information processing, and networking. The course presents current Information Technology (IT) topics designed to enable one with knowledge vital to a successful career as a manager. The student is provided with a knowledge of: hardware and software fundamentals, system categories, overviews of programming languages, networks and communications concepts, e-commerce concepts, cloud and distributed computing, middleware, database technology, ERP with an overview of the SAP product, system planning, systems development methodologies, traditional and object oriented analysis and design techniques, software package evaluation and selection techniques, IT management issues and practices. In class case studies are discussed and lectures may at times delve into deeper technical matters. This course provides the student with both conceptual and managerial knowledge as well as practical hands on knowledge, useful in joint project team settings and designed to allow one to better lead and participate in company projects.

MOT 0420 Design for Economy and Reliability **3 Credits**
Considerations of reliability permit a product to achieve a desired performance throughout its service life, thereby satisfying those who have purchased it. Careful thought and design produce reliability and economy of manufacture. This course instructs the prospective technology manager in the considerations leading to creation of cost-effective products of quality and presents: (1) the Total Design method, (2) concurrent engineering and the effective use of design reviews, (3) quality function deployment, (4) cost structures and models, (5) materials selection and economics, (6) robust design validation techniques and the Taguchi method, and (7) the Fault Tree and its use as a diagnostic aid in design validation.

MOT 0450 Planning, Research, and Development **3 Credits**
This course addresses the formation and development of new ideas and their subsequent use in the creation of products and services. This involves the creation of systems developed from the integration of knowledge in design, development, software and economics and the application of Earned Value and Accountancy. The knowledge so gained is to be applied, often iteratively, to create new conceptions of products and service. This work simultaneously addresses performance and cost. Graphic methods for planning projects are instructed. In addition specialized analytical processes are presented that permit an evaluation and critique of new concepts. These processes and techniques are applied in group activities. In addition, the course requires essential research into specific issues. This research is to be undertaken as part of homework assignments on recommended subjects in which the students will learn the methods that serve to enhance their knowledge and communicate this to enrich the lecture sessions in each class. In summary, the means for developing new ideas and methods to apply them are presented in this course. These newly learned resources will be applied in group actions to gain experience in their use and thus create useful tools for future circumstances that require their application.

MOT 0460 Project Management **3 Credits**
This course concentrates on the general methodology of managing a technology project from concept to operational use with emphasis on the functions, roles, and responsibilities of the project manager. Study of the basic principles and techniques related to controlling resources (i.e. people, materials, equipment, contractors, and cash flow) to complete a technology project on time and within budget while meeting the stated technical requirements. Through group and individual activities, including case study review, students will learn to apply project management tools and techniques.

MOT 0465 Agile Project Management **3 Credits**
Provides an introduction to Agile concepts and tools to create and improve customer and user value. A core set of lean and Agile concepts are presented and applied. Agile project management methods such as scrum or Kanban have become the de-facto standard in software development and are increasingly used in other areas as well. This course is an introduction to scrum and focuses on building experience with the method. Other Agile methods are covered as well. The course content, in addition to reading assignments, uses practical assignments such as case studies, projects, and simulations to provide applied experience with Agile practice.

MOT 0470 Leadership in Technical Enterprise **3 Credits**
This course introduces major leadership theories and explores the issues and challenges associated with leadership of technical organizations. The course integrates readings, experiential exercises, and contemporary leadership research theory. Participants investigate factors that influence effective organizational leadership as well as methods of enhancing their own leadership development. The course prepares executives, supervisors, and managers to master the complex interpersonal, social, political, and ethical dynamics required for leading modern organizations.

MOT 0485 Management of Intellectual Property **3 Credits**
Intellectual property may exist in many forms and often goes unrecognized as a part of the wealth of corporations when it can actually represent the most valuable property a corporation holds. This course instructs students in how to recognize the different types of intellectual property and the different forms of protection that may be used to protect its loss to competitive agencies. In addition to enlightenment as to what form it may take, the students are instructed in how to determine its monetary value and how to use it to advance important company objectives such as increasing sales volume and how to establish policies and methods to protect it from theft by competitive firms. Throughout the course, students learn how to address the legal issues surrounding the rights of ownership and the existence of infringements. They recognize the specific issues that distinguish an invention (or any other form of intellectual property) from its competition, causing it to obtain an edge in the market place.

MOT 0500 Introduction to Systems Engineering **3 Credits**
This course introduces students to the fundamental principles of systems engineering (SE) and their application to the development of complex systems. It describes the role that systems engineering plays as an integral component of program management. Topics include requirements analysis, concept definition, system synthesis, design trade-offs, risk assessment, interface definition, engineering design, system integration, and related systems engineering activities. The Friedman-Sage matrix is used as a framework for analysis purposes. The course defines the breadth and depth of the knowledge that the systems engineer must acquire concerning the characteristics of the diverse components that constitute the total system. Case studies and examples from various industries are used to illustrate the systems engineering process.

MOT 0510 Design for Reliability **3 Credits**
This course will present techniques to prevent operational failures through robust design and manufacturing processes. Engineering design reliability concepts based on statistical models and metrics will be introduced. Techniques to improve reliability, based on the study of root-cause failure mechanisms will be presented. Students will gain the fundamentals and skills in the field of reliability as it directly pertains to the design and the manufacture of software, electrical, mechanical, and electromechanical products. The course provides insight on how to incorporate reliability, availability, maintainability, and serviceability aspects (RAMS) into all phases of the product lifecycle.

MOT 0515 Independent Study **3 Credits**
This course is intended to broaden the student's knowledge in a specific area of interest. Students may pursue topics or projects under the supervision of a faculty member. Enrollment by permission only.

MOT 0525 Principles of Quality Management **3 Credits**
This course is designed to provide a comprehensive coverage of quality management including planning, assurance and control. It provides an introduction to the fundamental concepts of statistical process control, total quality management, Six Sigma and the application of these concepts, philosophies, and strategies to issues arising in government and industry. Emphasis will be placed on both theory and implementation methods. Students will gain an understanding of the application of the numerical tools used by teams in the quality management problem-solving process. Statistical methods and case studies are employed. The course is designed to assist students in developing processes by which they will be able to implement these methods in their working environment.

MOT 0591 Capstone I: Project Definition and Planning **3 Credits**
In this first semester of the capstone course, students form project groups, conceive technical approaches to problem solutions, and develop detailed plans and a schedule for project activities. Students execute the planning process using appropriate professional software such as Microsoft Project. Students in each team produce a detailed project plan defining the work to be done (task descriptions), the task/subtask organizational structure, task responsibilities (assigning who does what), the task execution schedule (e.g., Gantt charts), areas of risk and risk abatement concepts, and provide an explanation of the value of the work to be performed to fulfill the objectives.

MOT 0592 Capstone II: Project Execution and Results **3 Credits**
The second semester of the capstone course concerns implementation of the project plan developed in the prior semester. This typically includes hardware fabrication, software development supporting analytical work, detailed design, experimental studies, system integration, and validation testing, all of which serve as proof of meeting project objectives in data and functional demonstrations. Project teams submit a final report for grading and make a formal presentation to faculty, mentors, and interested personnel from associated industries.