MASTER OF SCIENCE IN MANAGEMENT OF TECHNOLOGY

The Management of Technology program (MSMOT) at Fairfield University serves the needs of professional technologists, engineers and managers in their progression into management-level positions. The program instructs and trains engineers and scientists, and motivated people from any discipline who have a need to make management decisions in a technology environment or will be involved in the management of such functions as technology research and development, product design, manufacturing, human and physical resources, product and system test, information and data analysis, and product and service support.

The program is intended for technologists and those involved in technology-dependent enterprises who aspire to favorably position their companies in fast-paced markets, influence crucial decision-making in pursuing new technologies and improve the likelihood of corporate success. Graduates of the program are able to help their organizations embrace technology innovation in a timely fashion, focusing the energy of their companies on translating research and development efforts rapidly and effectively into manufacturing strategies and products that satisfy market needs.

Mission

To prepare managers and leaders with the skills and competencies that will enable them to

- Understand, manage and lead organizations.
- Embrace technology innovation to remain competitive.
- Translate technology into business terms to result in richer business decisions, and a higher likelihood of breakthrough business performance.
- Assess, develop and apply solutions to the challenges confronting organizations in today's global economy.

Program Overview

This graduate degree program is designed to enhance your technical experience with advanced management and leadership skills. The program addresses the needs of the technically trained employee who must use business principles across the entire gamut of engineering disciplines. The non-technically trained person will also benefit from this program as business management has become intertwined with technology. Learning the skills this program affords will help prepare you to manage the domestic and global resources and processes required in today's business environment.

MSMOT graduates become effective leaders in small and large companies, providing creative guidance to the development and/or adoption and marketing of technology products and services. Specific program objectives include the following:

- To train the technically proficient by adding to their skills a deeper comprehension of business planning and economics, and an understanding of global markets, thereby empowering them to develop entrepreneurial skills. Technologists who are, or aspire to be employed as managers or supervisors and who currently engage in technology planning and development will be immersed in an educational program that integrates studies in technology management with modern management principles and practices.
- To enhance the skills of technologists in the design and manufacturing disciplines, in the management and effective use of information resources, and in the developing strategies that are crucial to effective leadership in technological entrepreneurship.
- To provide graduates in engineering, science and other disciplines with the opportunity to pursue a graduate program that expands their career paths and ultimately leads to leadership roles in technology-dependent businesses.
- To provide technology-dependent business and industry enterprises in Connecticut with people skilled in the management of technology and capable of enhancing the strength and competitiveness of those businesses. The outcome will serve to enrich the entrepreneurial climate in the state.
- To learn the skills relevant to today's competitive global environment where technology is increasingly a core competency of all organizations.

As a consequence of participating in this degree experience, the student will gain the following specific learning outcomes:

- Identify, prioritize, and solve technical and management related problems through analysis, synthesis, and evaluative processes.
- Understand how to plan, organize, lead, and control within an organizational setting.
- Interact with team members and/or work groups to achieve a common goal.
- Increase their individual knowledge and understanding of group and team interactions, and their impact upon business productivity, efficiency, and effectiveness.
- Recognize the skills and techniques needed for problem solving and decision making.
- Communicate effectively both orally and in writing.
- Understand basic accounting methods and their business applications.
- Use financial analysis within a business environment.
- Apply the strategic management process to an analysis of the business environment and make recommendations on preferred courses of action.
- Recognize ethical issues in the management of technology and in the decision making process in business and industry; and stimulate the student's sense of responsibility and help them deal with ambiguity.

Almost all of the MSMOT faculty have been engineers, managers and leaders in industry. Some have started their own companies. They know what it takes to succeed in the business world. They stand ready to help you move your career into overdrive with the new skills and competencies that you will gain.

Students

The MSMOT program is designed to accommodate students who wish to attend on a full-time or part-time basis. The program is directed toward the following student groups:

1. Engineers and scientists who need skills in critical thinking and decision-making to effectively guide the technology that will enhance product and service quality and their employer's business opportunities

2. Professionals who are charged with implementing technology initiatives in order to effectively compete in the 21st century with a lead over their competitors
3. Managers of technical and business activities responsible for creating strategic business plans and overseeing their execution
4. Research and development practitioners who require skills to recognize relevant technologies developed outside their own business organization and who must judge the merits of investing in them
5. Engineers and scientists who aspire to careers in management and require the knowledge to systematically integrate technology into their company's activity
6. Engineers and scientists interested in academic careers combining science, engineering, and management
7. Technologists who require broad management skills to provide leadership in business

The program does not require the GRE or other standardized testing. International students must take either the TOEFL or the IELTS exam.

Curriculum

The MSMOT program offers courses affording students the opportunity to establish the foundations of technology management, and then choose a set of electives that best reflects their interests. Of these courses, several are in the School of Business MBA program. A total of 10 courses, including the two-term capstone course, will earn a student the Master's degree. Entering students are expected to have an adequate background in probability and statistics, computer programming using at least one higher order language, and financial accounting.

Program

For the Master of Science in Management of Technology, students complete the following:

Code	Title	Credits
ACCT 6500	Accounting Information for Decision-Making [B]	3
or FNCE 5400	Principles of Finance	
or ACCT 5400	Introduction to Accounting	
MGMT 6508	Strategic Management of Technology and Innovation: The Entrepreneurial Firm [B]	3
MGMT 6584	Global Competitive Strategy [B]	3
or MGTN 6505	Introduction to Systems Engineering	
MGTN 5415	Information Systems	3
MGTN 5460	Project Management	3
MGTN 5470	Leadership in Technical Enterprise	3
MGTN 6961	Capstone I: Project Definition and Planning	3
MGTN 6962	Capstone II: Project Execution and Results	3
Select two elective courses [1]		6
Total Credits		**30**

Of particular note among the required courses is the MGTN 6961 and MGTN 6962 course sequence, which constitutes the MSMOT capstone, a team-driven effort to define and design realizable solutions to real-world technical/business projects. The capstone courses are supervised by faculty mentors.

B Indicates a course offered by the Dolan School of Business.

1 MSMOT students may select any of the courses listed below, or any graduate courses offered by the University. Students should consult the MOT program director to discuss their specific needs.

Elective Courses

In addition to the required courses, students must complete two elective courses. MSMOT students may elect to enroll in graduate courses in *any* discipline within the University that will assist them in meeting their career objectives. Care must be taken to meet the applicable prerequisite courses. Students may, if they choose, take courses in concentration areas such as Management of Design and Manufacturing, Strategic Management of Resources, Management of Information Technology, Systems Engineering Concepts and Methods, and healthcare. Representative course electives are shown below:

Code	Title	Credits
Management of Resources		
MGMT 6540	Cross Cultural Management and Sustainable Leadership [B]	3
MGMT 6584	Global Competitive Strategy [B]	3
MGTN 5420	Design for Economy and Reliability	3
MGTN 5450	Planning, Research, and Development	3
MGTN 5465	Agile Project Management	3
MGTN 5485	Management of Intellectual Property	3
MKTG 5400	Marketing Management [B]	3
MKTG 6500	Customer Value [B]	3
MKTG 6540	Advertising Management [B]	3
Management of Information Technology		
SWEG 5301	Software Engineering Methods	3
SWEG 5357	Database Management Systems	3
SWEG 5407	Java for Programmers	3
SWEG 5427	Operating Systems and Programming	3
SWEG 5530	Introduction to Information Security	3
SWEG 6404	Network Security	3
SWEG 6448	Server Management	3
SWEG 6505	Advanced Database Concepts	3
SWEG 6508	Data Warehouse Systems	3
SWEG 6512	Web Development II with ASP.NET	3
SWEG 6518	Data Mining and Business Intelligence	3
SWEG 6530	Applications and Data Security	3
SWEG 6596	Network Routing and Switching	3
Mechanical Engineering		
MEEG 5322	Advanced Dynamics	3
MEEG 5327	Fracture Mechanics	3
MEEG 5330	Mechanics of Composite Materials	3
Systems Engineering Concepts and Methods		
MGTN 6505	Introduction to Systems Engineering	3
MGTN 6525	Principles of Quality Management	3

B Indicates a course offered by the Dolan School of Business.

Note: A maximum of five courses from the MBA curriculum in the Dolan School of Business may be applied to the MSMOT degree.

Courses

MGTN 5405 Supply Chain Design **3 Credits**
This course is designed to equip and prepare the student with the understanding, management tools, and strategies for supply chain design and management in a global supplier environment. Using analytical techniques, modeling, and industrial scenarios, this course looks in depth at development and manufacturing processes, quality management infrastructure logistics strategies, and culture necessary in evaluating and selecting suppliers for various degrees of added value. 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.

MGTN 5407 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.

MGTN 5415 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.

MGTN 5420 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.

MGTN 5450 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.

MGTN 5460 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.

MGTN 5465 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.

MGTN 5470 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.

MGTN 5485 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.

MGTN 6505 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.

MGTN 6510 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 life cycle.

MGTN 6525 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.

MGTN 6961 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.

MGTN 6962 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.

MGTN 6990 Independent Study **1-3 Credits**
This course is intended to broaden the graduate student's knowledge in a specific area of interest. Students may pursue topics or projects under the supervision of a faculty member. Enrollment by departmental approval only.