Engineering Management
Master of Science Degree
(For students entering their program
July 2019 – 201940 or later)

General Information

The master's program in Engineering Management (MSEM) at New England Institute of Technology is designed for engineering professionals who desire to advance their technical and managerial knowledge in the engineering industry. The program emphasizes the relevance of continuous learning to personal and professional growth through the combination of advanced traditional engineering management courses and an integrated management core.

The MSEM program is designed to equip current or aspiring engineering managers with the necessary tools to make thoughtful decisions that affect an organization's management needs. The program's mission is built around central themes that drive modern engineering industry operations: best practices of leaders and management professionals in the engineering industry, engineering project accounting and finance, engineering law, and the software applications that support the engineering management profession.

Successful graduates may be able to advance their careers by qualifying for positions such as project managers, project executives, directors of engineering operations, and comparable leadership roles in the engineering management field.

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Program Mission, Goals and Outcomes

Program Mission and Goals:
The master's degree in Engineering Management is designed for experienced professionals who have earned a bachelor's degree in engineering or related scientific areas and want to develop superior skills in managing engineering projects, products and services. The program bridges the gap between the field of engineering and the field of business management by equipping students with the technical expertise and leadership skills they need to advance their career in the fast-paced world of technology.

The coursework includes topics such as project management, corporate finance and business analysis, organizational behavior and ethics as well as systems engineering and decision models. The MSEM program will provide the engineer with the necessary business intelligence to improve overall processes while understanding the human elements and legal implications of any engineering discipline.

The program is comprised of 45 credit hours (11 courses) and builds upon the mathematical and analytical expertise gained from prior engineering education and/or professional experience.

Program Outcomes:
Students will:
1. Lead complex engineering and capital-intensive organizations with globally dispersed organizational structures.

2. Solve industry-related problems by applying their knowledge of business, mathematics, science and engineering.

3. Understand the implications of emerging technologies on the organization and society.

4. Interpret quantitative and subjective data to make sound engineering and managerial decisions.

5. Apply systems engineering to solve complex technical and operational problems to meet both business and customer needs.

6. Lead effective teams and develop quality projects.

7. Communicate effectively across the entire enterprise, both vertically and horizontally to all members of the organization.

8. Understand the ethical responsibilities of practicing engineering managers and the impact of their decisions within a global, societal and environmental context.

9. Appreciate the need for life-long learning and personal development.

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Curriculum
Sample Plan of Study
Course Schedule subject to change

Term I					
Course No.		*Course Title*	*C*	*L*	*T*
EMG	512	Systems Engineering	4	0	4
MGM	533	Advanced Project Management	4	0	4
			8	**0**	**8**

Term II					
Course No.		*Course Title*	*C*	*L*	*T*
EMG	511	Human Centered Design Thinking	4	0	4
MGM	514	Leadership	4	0	4
			8	**0**	**8**

Term III					
Course No.		*Course Title*	*C*	*L*	*T*
EMG	522	Quantitative Business Analysis	4	0	4
MGM	504	Managerial Finance	4	0	4
		Optional			
CPT	591	Workplace Practicum I	0	20	1
			8	**0/20**	**8/9**

Term IV					
Course No.		*Course Title*	*C*	*L*	*T*
EMG	502	Emerging Technologies	4	0	4
MGM	534	Technology and the Law	4	0	4
		Optional			
CPT	592	Workplace Practicum II	0	20	1
			8	**0/20**	**8/9**

Term V					
Course No.		*Course Title*	*C*	*L*	*T*
EMG	544	Decision Models	4	0	4
MGM	546	Ethical Decision Making	4	0	4
		Optional			
CPT	593	Workplace Practicum III	0	20	1
			8	**0/20**	**8/9**

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Term VI			C	L	T
Course No.		*Course Title*	C	L	T
EMG	556	Master's Capstone	5	0	5
		Optional			
CPT	594	Workplace Practicum IV	0	20	1
			5	**0/20**	**5/6**
Total Quarter Credit Hours = 45-49					

Legend
C = Number of lecture hours per week
L = Number of laboratory hours per week
T = Total Quarter Credit Hours where each lecture hour per week is one credit, every 2-4 laboratory hours are one credit depending on the expected amount of pre- or post-lab work.

Subject to change.

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Degree Progress Checklist

Check off each completed course.

T1	EMG	512	_____
	MGM	533	_____
T2	EMG	511	_____
	MGM	514	_____
T3	MGM	504	_____
	EMG	522	_____
	Optional		
	CPT	591	_____
T4	EMG	502	_____
	MGM	534	_____
	Optional		
	CPT	592	_____
T5	EMG	544	_____
	MGM	546	_____
	Optional		
	CPT	593	_____
T6	EMG	556	_____
	Optional		
	CPT	594	_____

Subject to change.
Please see your graduate advisor for any
questions.

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Course Descriptions

EMG 502 Emerging Technologies
4 Class Hours 4 Quarter Credit Hours
This course will be presented through the lens of the past, present, and future of technology and innovation, exploring related issues and the potential impact of technologies on organizations and society. Topics will include the study of how new technologies have impacted businesses historically, how current technologies are implemented, and how emerging technologies may impact industries and consumers. The course will examine the strategic implications associated with emerging, disruptive, and sustaining technologies.

EMG 511 Human-Centered Design Thinking
4 Class Hours 4 Quarter Credit Hours
This course is the foundation of what the program defines as the practice and methods of design. Utilizing "Design Think" methodology, students will execute a variety of interdisciplinary projects and iterate the methods of observation, ideation, prototyping, and user feedback. Successful students will be able to convert needs into desirable solutions that will facilitate more creative and innovative people and organizations.

EMG 512 Systems Engineering
4 Class Hours 4 Quarter Credit Hours
Systems Engineering is an interdisciplinary approach and means to enable the realization of successful systems. It focuses on defining customer needs and required functionality early in the development cycle, documenting requirements, then proceeding with design synthesis and system validation while considering the complete problem including operations, performance, test, manufacturing, cost, and schedule. Emphasis includes the links of systems engineering to fundamentals of decision theory, statistics, lean Six Sigma and optimization. It also introduces the most current, commercially successful techniques for systems engineering.

EMG 522 Quantitative Business Analysis
4 Class Hours 4 Quarter Credit Hours
This course introduces a structured approach to problem solving and the fundamental quantitative methods used to formulate and solve problems to support business decision-making. Students will practice both analyses of complex situations and communication of results based on these decision models.

EMG 544 Decision Models
4 Class Hours 4 Quarter Credit Hours
Successful management requires the ability to recognize a decision situation, understand its essential features, and make a choice. However, many of these situations – particularly those involving uncertainty and/or complex interactions – may be too difficult to grasp intuitively, and the stakes may be too high to learn by experience. This course introduces spreadsheet modeling, simulation, decision analysis and optimization to represent and analyze such complex problems. The skills learned in this course are applicable in almost all aspects of business.

EMG 556 Master's Capstone
5 Class Hours 5 Quarter Credit Hours
Students must choose one of the following two options:

Option 1: The master's project option requires engineering management students to demonstrate their competence in the skills and knowledge associated with their degree program. It is designed to show the in-depth learning and higher-order thinking of the students. With this option, students must choose a project in the field of engineering management. Then they will plan, organize, implement, and work towards the completion of the project in a controlled manner, so as to meet the goals and objectives of their project. The capstone project is usually carried out by an individual student and may be derived from the student's workplace where the student can exploit the workplace experience to benefit both the student and the student's employer. Before beginning work, each capstone project must first be approved by the MSEM Master's Project Committee. At the end of the project, the student will prepare a Final Project Report and defend this work product before the Program Director and members of the Committee.

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Option 2: The master's thesis option requires the engineering management students to carry out an investigation of technology or methodology in which the student has a strong interest. The topic of this investigation or research should be an extension or continuation of the topics covered in the MSEM curriculum. Before beginning this work, the topic must be approved by the MSEM Master's Project Committee. The student will submit a final report on the research and present the research before the Program Director and members of the Committee.

CPT 591 Workplace Practicum I
20 Field Hours 1 Quarter Credit Hour
Prerequisite: Requires successful completion of four courses in the master's program and approval of the Graduate Director or Department Chair
In this optional course, students will use knowledge gained through previous coursework in the master's program with planned and supervised work experiences in the public or private sector. The course allows students to enhance the practical skills necessary for success by being exposed to the reality of the world of work beyond the boundaries of the campus and enhancing their self-confidence and career direction. Students are required to provide bi-weekly status reports to the Graduate Program Director while enrolled in this course.

CPT 592 Workplace Practicum II
20 Field Hours 1 Quarter Credit Hour
Prerequisite: CPT 591
This course is a continuation of the Workplace Practicum begun in CPT 591.

CPT 593 Workplace Practicum III
20 Field Hours 1 Quarter Credit Hour
Prerequisite: CPT 592
This course is a continuation of the Workplace Practicum begun in CPT 591 and continued in CPT 592.

CPT 594 Workplace Practicum IV
20 Field Hours 1 Quarter Credit Hour
Prerequisite: CPT 593
This course is a continuation of the Workplace Practicum begun in CPT 591 and continued in CPT 593.

MGM 504 Managerial Finance
4 Class Hours 4 Quarter Credit Hours
Prerequisite: MGM 533
Students will examine the basic principles of finance and their application to decision-making in organizations. The overall purpose of this course is for students to obtain a working knowledge of banking, financial statements, and capital budgeting.

MGM 514 Leadership
4 Class Hours 4 Quarter Credit Hours
Leadership is about developing a vision and inspiring others to achieve that vision. It is wayfinding through effective communication. Leaders seek to understand and shape organizational culture, while effecting and supporting positive change. This course provides aspiring leaders with tools to develop a confident voice for their own current and future leadership roles. The major theories of leading and managing people and organizations will be applied to real leadership situations in organizations ranging from start-ups to large enterprises, as well as real leaders in the student's chosen field. While seeking a deep understanding of their own leadership style, students will examine the interaction between leadership and organizational culture, culminating in the development of a personalized comprehensive leadership development plan.

MGM 533 Advanced Project Management
4 Class Hours 4 Quarter Credit Hours
Project management is more than merely parceling out work assignments to individuals and hoping that they will somehow accomplish a desired result. In fact, projects that could have been successful often fail because of such take-it-

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for-granted approaches. Individuals need hard information and real skills to work successfully in a project environment and to accomplish project objectives. Topics include project management life cycle and process; identifying and selecting projects; developing a project proposal; techniques for planning, scheduling, resource assignment, budgeting, and controlling project performance; project risks; project manager responsibilities and skills; project team development and effectiveness; project communication and documentation; and project management organizational structures. The concepts in the course support the project management knowledge areas of the Project Management Institute's A Guide to the Project Management Body of Knowledge (PMBOK® Guide).

MGM 534 Technology and the Law
4 Class Hours 4 Quarter Credit Hours
Pre/Co-requisite: MGM 533
This course is designed to provide a broad-based analysis of the legal issues relevant to technology-related fields. It provides a foundation for intellectual property topics associated with domestic and international business ventures such as copyright, trademark, and patent issues. Existing and pending contract and human resources laws and regulations will be addressed as well as the legal issues associated with negotiations and entrepreneurship.

MGM 546 Ethical Decision Making
4 Class Hours 4 Quarter Credit Hours
As future managers and leaders, students will be confronted by many challenging ethical dilemmas where the correct decision is not clear or may not even exist. This course aims to increase the student's ability to recognize ethical dilemmas, distinguish between legal versus ethical considerations, identify stakeholders, and generate and evaluate alternatives. Students will examine frameworks for ethical decision-making and engage with case studies and ethical scenarios where the decision-making process is as important as the final decision students reach.

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Questions & Answers

1. When do my classes meet?
This evening program has two courses per term. Each course meets once a week from 6:30-10 p.m.

At the beginning of each term you will receive a detailed schedule giving the exact time and location of all your classes. The College requires that all students be prepared to take classes and receive services at any of NEIT's locations where the appropriate classes and services are offered.

Classes cancelled by the university for any reason will be rescheduled.

2. How large will my classes be?
The average size for a class is about 15 to 20 students; however, larger and smaller classes occur from time to time.

3. Where do my classes meet?
Classes meet on the East Greenwich campus. Some courses may be offered online.

4. How long should it take me to complete my program?
To complete your degree requirements in the shortest possible time, you should take the courses outlined in the prescribed curriculum. For a typical six-term curriculum a student may complete the requirements in as little as 18 months.

5. Is NEIT accredited?
NEIT is accredited by the New England Commission of Higher Education (formerly the Commission on Institutions of Higher Education of the New England Association of Schools and Colleges, Inc.). Accreditation by NECHE is recognized by the federal government and entitles NEIT to participate in federal financial aid programs. Some academic departments have specialized professional accreditations in addition to accreditation by NECHE. For more information on accreditation, see NEIT's catalog.

6. Can I transfer the credits that I earn at NEIT to another college?
The transferability of a course is always up to the institution to which the student is transferring. Students interested in the transferability of their credits should contact the Office of Teaching and Learning for further information.

7. Can I transfer credits earned at another college to NEIT?
Transfer credit for appropriate courses taken at accredited institutions will be considered for courses in which the student has earned a "B" or above. An official transcript from the other institution must be received before the end of the first week of the term for transfer credit to be granted for courses to be taken during that term. Students will receive a tuition reduction for the approved courses based on the program rate and will be applied against the final academic term of the curriculum's tuition amount. No tuition credit is provided for technical courses which are not a part of the curriculum.

Students may transfer no more than 4 credits (one course).

8. How many credits do I need to acquire my Financial Aid?
Students entering the MSEM program will be eligible for various forms of financial aid, including loans, if they take at least 4 credits per term.

9. What does my program cost?
The cost of your program will be as outlined in your enrollment agreement, along with your cost for books and other course materials.

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10. What kind of employment assistance does NEIT offer?

The Career Services Office assists NEIT students and graduates in all aspects of the job search, including resume writing, interviewing skills, and developing of a job search strategy. Upon completion of their program, graduates may submit a resume to the Career Services Office to be circulated to employers for employment opportunities in their fields. Employers regularly contact us about our graduates. In addition, our Career Services Office contacts employers to develop job leads. A strong relationship with employers exists as a result of our training students to meet the needs of industry for over fifty years. No school can, and NEIT does not, guarantee to its graduates employment or a specific starting salary.

11. Where will job opportunities exist?

Engineering Management is a career that brings together the technological problem-solving savvy of engineering and the organizational, administrative, and planning abilities of management in order to oversee complex enterprises from conception to completion. Engineering managers possess the practical experience as engineers that enables them to apply technical expertise to a project, but it's equally critical that they have the skills to organize and direct projects, as well as manage a variety of personnel, such as scientists, other engineers and support staff.

Engineering managers plan, coordinate, and supervise research, development, and production in a variety of engineering fields. Engineering management job duties may include:
- overseeing the design of machinery, equipment, products or systems
- directing production, quality assurance or maintenance
- designing and assessing the feasibility of new products or processes
- coordinating with other units, such as management, financial or marketing

Engineering managers are in demand nationwide.

12. Do I need an engineering degree to enter the program?

Yes. A B.S. degree in engineering, engineering technology or a related field from an accredited institution is required for before beginning this degree program. You may enroll in this program pending the completion of your current BS degree. Significant professional experience may be considered in lieu of an appropriate degree. A transcript and/or a resume should be supplied to satisfy either of these requirements.

13. Do I need a certain grade point average to enter the program?

Yes, you will need a 2.5 grade point average to enter the program.

14. Are there any other special entrance requirements?

Yes. You will need to write a personal statement as part of your admission process that details your interest in the program and how it will enable you to accomplish your professional goals.

15. Do I need to maintain a certain grade point average?

Yes. You are required to maintain a cumulative grade point average of at least 3.0 throughout the program. The minimum passing grade for a course in the MSEM program is a C (73%).

16. What happens if I earn less than a C in a course?

Students who earn less than a C in any course will be required to re-take the course the next time it is offered. If the student does not earn a C or better in a course after the second attempt, he/she will be dismissed from the MSEM program. Students will only be allowed to re-take two courses.

17. What are the hardware and software requirements for the program?

	Recommended Minimum
Operating System:	Windows 10 or Macintosh OS X (10.14)
Processor:	2+ GHz
Memory:	4GB
Plug-ins:	Adobe PDF Reader, Flash Adobe PDF Reader, Flash and others as required by

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	specific courses
Players:	QuickTime, Java Player, Java
Browser:	Chrome, IE, Safari, Edge, Firefox (all latest versions)
Display:	1024x768
Software:	Office 365 (2016)
Internet Connection:	FiOS/DSL/CABLE DSL/CABLE
Email Account:	New England Tech student email account
Sound Card:	Required
Other (some programs):	• A webcam (the one built into your laptop or iPad should be fine) • A microphone (built into the computer or headset is handy). • A digital camera (the one on a smart phone is fine).

Online students must be capable of installing and maintaining their own computer's hardware and software. New England Tech does not assist students with the setup of their computers.

Information about obtaining the software (if any) will be made available to you at the start of each course.

Note: Tablets and smartphones can be convenient for reading course materials and email but will not be sufficient for doing all of your course work.

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Technical Standards

These technical standards set forth by the engineering department establish the essential qualifications considered necessary for students admitted to the program. The successful student must possess the following skills and abilities or be able to demonstrate they can complete the requirements of the program with or without reasonable accommodation, using some other combination of skills and abilities.

Cognitive Ability
- Good reasoning and critical thinking skills.
- Problem solving skills and techniques.
- Ability to learn, remember and recall detailed information and to use it for problem solving.
- Ability to deal with materials and problems such as organizing or reorganizing information.
- Ability to use abstractions in specific concrete situations.
- Ability to separate complex information into its component parts.
- Ability to perform tasks by observing demonstrations.
- Ability to perform tasks by following written instructions.
- Ability to perform tasks following verbal instructions.
- Possession of basic keyboarding skills and knowledge of computer programs.

Communications Skills
- Ability to speak in understandable English in a classroom situation on a one-on-one basis as well as before a group.
- Ability to communicate effectively with faculty and other students.
- Ability to demonstrate and use the knowledge acquired during the classroom training process.
- Ability to verbally express technical concepts clearly and distinctly.
- Ability to express thoughts clearly.

Adaptive Ability
- Ability to remain calm in the face of computer lab equipment and/or software failure.
- Ability to maintain emotional stability and the maturity necessary to interact with members of the faculty and students in a responsible manner.
- Ability to tolerate the differences in all students, faculty, and administration.
- Ability to follow instructions and complete tasks under stressful and demanding conditions.
- Ability to adapt in a positive manner to new and changing situations with an open mind and flexibility.
- Ability to think clearly and act quickly and appropriately in stressful situations.

Physical Ability
- Ability to sit continuously at a personal computer for long periods of time in order to learn and complete projects and/or assignments.
- Ability to perform learned skills independently, with accuracy and completeness within reasonable time frames in accordance with classroom and business procedures.

Manual Ability
- Sufficient motor function and sensory abilities to participate effectively in the classroom laboratory.
- Sufficient manual dexterity and motor coordination to coordinate hands, eyes and fingers in the operation of computers, business equipment and other required classroom or laboratory tools and equipment.

Sensory Ability
Visual
- Acute enough to see clearly and interpret the contents on a computer screen or other classroom tools.