The Master of Science in Engineering Management offers graduate students an opportunity to develop both the technical expertise and the business competence that is in high demand among prospective technology-based employers. Industry leaders are seeking qualified and talented individuals who are not only able to guide research and design teams but also able to direct and supervise development and production processes. The combination of technical proficiency and business skills fostered in the engineering management program is designed to provide a competitive edge for graduates seeking a wide range of positions in technology-based product or service industries, as well as in comparable local, state, and federal programs.

The program was designed by experienced high-level managers and academic leaders as an option for engineers and scientists to broaden their skill sets to include management tools and techniques that are applicable to technology-based industries. Graduates of the engineering management program work as product managers, or leaders of teams in technical industries. Upon completion of the program, students find that their acquired skills are applicable to a wide range of industries, primarily those focused upon the development of technical products and the management of technical projects.

Graduates may assist companies in bringing a product from idea through its development phases to its introduction to the marketplace. They may also be involved in forming and managing teams for assessing cost-effectiveness, formulating strategies to improve production, or analyzing a company’s supply chain. Most of these projects cannot be successfully completed without the skills of those possessing a background in management decision making and engineering expertise; therefore, the engineering management graduate is often a technical liaison to management. As a result, many of these assignments have actually proven to be a gateway to upper-level management positions.

The current program of study can be taken on a part-time or full-time basis on-ground or online. There are four core courses required of all students, which have been formulated to satisfy the foundation requirements of economic decision making, decision-making mathematics, and project management. In addition to these required courses, the curriculum consists of electives that allow students to choose either a broad-based program of study or one centered on a particular concentration. Some students may elect to refresh or enhance their technical skills in engineering-based subjects such as information systems, computer systems engineering, or graduate courses from the traditional engineering disciplines. Other students may prefer to broaden their knowledge base by selecting course work in management subjects such as engineering organizational psychology, financial management, logistics and warehousing, supply chain engineering, or lean systems design. Additionally, students may also elect to complete the Gordon Engineering Leadership Program as part of their engineering management degree.

One recent graduate has observed that “Northeastern’s MSEM is like an MBA for engineers, with high-quality, dedicated professors who are proficient in their field yet are able to convey information in a way that’s easy to understand.” This graduate also noted, “My courses in project management have been key to understanding the subtleties that affect Project Managers while technical courses provide a strong background in fundamentals as well as specialty topics. My experience with co-op has been outstanding and has truly helped me further my career.”

MSEM—Master of Science in Engineering Management

Complete all courses and requirements listed below unless otherwise indicated.

GENERAL REQUIREMENTS

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>SH</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR 6205</td>
<td>Deterministics Operations Research</td>
<td>4</td>
</tr>
<tr>
<td>EMGT 5220</td>
<td>Engineering Project Management</td>
<td>4</td>
</tr>
<tr>
<td>EMGT 6225</td>
<td>Economic Decision Making</td>
<td>4</td>
</tr>
<tr>
<td>IE 6200</td>
<td>Engineering Probability and Statistics</td>
<td>4</td>
</tr>
</tbody>
</table>

OPTIONS

Complete one of the following options:

Course Work Option

Complete 16 semester hours from the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>SH</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSYE 6200</td>
<td>Concepts of Object-Oriented Design</td>
<td>4</td>
</tr>
<tr>
<td>CSYE 6210</td>
<td>Component Software Development</td>
<td>4</td>
</tr>
<tr>
<td>CSYE 6220</td>
<td>Enterprise Software Design</td>
<td>4</td>
</tr>
<tr>
<td>CSYE 7230</td>
<td>Software Engineering</td>
<td>4</td>
</tr>
<tr>
<td>CSYE 7270</td>
<td>Building Virtual Environments</td>
<td>4</td>
</tr>
<tr>
<td>CSYE 7280</td>
<td>Advanced User Experience Design and Testing</td>
<td>4</td>
</tr>
<tr>
<td>ENSY 5000</td>
<td>Fundamentals of Energy System Integration</td>
<td>4</td>
</tr>
<tr>
<td>EMGT 5300</td>
<td>Engineering/Organizational Psychology</td>
<td>4</td>
</tr>
<tr>
<td>EMGT 6305</td>
<td>Financial Management for Engineers</td>
<td>4</td>
</tr>
<tr>
<td>EMGT 7978</td>
<td>Independent Study</td>
<td>1 to 4</td>
</tr>
<tr>
<td>ENTR 6200</td>
<td>Enterprise Growth and Innovation</td>
<td>3</td>
</tr>
<tr>
<td>ENTR 6212</td>
<td>Business Planning for New Ventures</td>
<td>3</td>
</tr>
<tr>
<td>ENTR 6218</td>
<td>Business Model Design and Innovation</td>
<td>3</td>
</tr>
<tr>
<td>ENTR 6219</td>
<td>Financing Ventures from Early Stage to Exit</td>
<td>3</td>
</tr>
</tbody>
</table>

Note that these pages are extracted from the full Graduate Catalog, please refer to it for complete details.
Complete three of the following courses (12 semester hours):

**Electives**

- **CSYE 6200** Concepts of Object-Oriented Design 4 SH
- **CSYE 6210** Component Software Development 4 SH
- **CSYE 6220** Enterprise Software Design 4 SH
- **CSYE 7230** Software Engineering 4 SH
- **CSYE 7270** Building Virtual Environments 4 SH
- **CSYE 7280** Advanced User Experience Design 4 SH
- **ENMG 5300** Engineering/Organizational Psychology 4 SH
- **ENMG 6305** Financial Management for Engineers 4 SH
- **ENMG 7978** Independent Study 1 to 4 SH
- **ENTN 6200** Enterprise Growth and Innovation 3 SH
- **ENTN 6212** Business Planning for New Ventures 3 SH
- **ENTN 6218** Business Model Design and Innovation 3 SH
- **ENTN 6219** Financing Ventures from Early Stage to Exit 3 SH
- **GE 5100** Product Development for Engineers 4 SH
- **IE 5400** Healthcare Systems Modeling and Analysis 4 SH
- **IE 5500** Systems Engineering in Public Programs 4 SH
- **IE 5620** Mass Customization 4 SH
- **IE 7200** Supply Chain Engineering 4 SH
- **IE 7210** Production System 4 SH
- **IE 7255** Manufacturing Processes 4 SH
- **IE 7270** Intelligent Manufacturing 4 SH
- **IE 7275** Data Mining in Engineering 4 SH
- **IE 7280** Statistical Methods in Engineering 4 SH
- **IE 7285** Statistical Quality Control 4 SH
- **IE 7290** Reliability Analysis and Risk Assessment 4 SH
- **IE 7315** Human Factors Engineering 4 SH
- **IE 7615** Neural Networks in Engineering 4 SH
- **INFO 6210** Data Management and Database Design 4 SH
- **INFO 6215** Business Analysis and Information Engineering 4 SH
- **INFO 7245** Agile Software Development 4 SH
- **INFO 7260** Business Process Engineering 4 SH
- **INFO 7285** Organizational Change and IT 4 SH
- **INFO 7290** Data Warehousing and Integration 4 SH
- **INFO 7330** Information Systems for Healthcare-Services Delivery 4 SH
- **INFO 7390** Advances in Data Sciences and Architecture 4 SH
- **MGSC 6206** Management of Service and Manufacturing Operations 3 SH
- **OR 7230** Probabilistic Operation Research 4 SH
- **OR 7235** Integer and Nonlinear Optimization 4 SH
- **OR 7240** Network Analysis and Advanced Optimization 4 SH
- **OR 7245** Multi-Criteria Decision Making 4 SH
- **OR 7310** Logistics, Warehousing, and Scheduling 4 SH
- **SCHM 6210** Supply Chain Management 3 SH
- **SCHM 6211** The Transportation Industries 3 SH
- **SCHM 6212** Executive Roundtable in Supply Chain Management 3 SH
- **SCHM 6213** Global Supply Chain Management 3 SH
- **SCHM 6215** IT Applications in Supply Chain Management 3 SH
- **TECE 6200** Innovation and Entrepreneurial Growth 3 SH
- **TECE 6222** Emerging and Disruptive Technologies 3 SH
- **TECE 6230** Entrepreneurial Marketing and Selling 3 SH
- **TECE 6340** The Technical Entrepreneur as Leader 3 SH
- **TECE 6250** Lean Design and Development 3 SH
- **TECE 6300** Managing a Technology-Based Business 3 SH
- **TELE 5310** Fundamentals of Communication Systems 4 SH
- **TELE 5330** Data Networking 4 SH
- **XINFO 5000** Fundamentals of Energy System Integration 4 SH
- **XMGSC 5000** Systems Engineering in Public Programs 4 SH
- **XOR 7230** Probabilistic Operation Research 4 SH
- **XOR 7290** Statistical Quality Control 4 SH
- **XOR 7310** Logistics, Warehousing, and Scheduling 4 SH
- **XTECE 6200** Innovation and Entrepreneurial Growth 3 SH
- **XTECE 6222** Emerging and Disruptive Technologies 3 SH
- **XTECE 6230** Entrepreneurial Marketing and Selling 3 SH
- **XTECE 6340** The Technical Entrepreneur as Leader 3 SH
- **XTECE 6250** Lean Design and Development 3 SH
- **XTELE 5310** Fundamentals of Communication Systems 4 SH
- **XTELE 5330** Data Networking 4 SH
- **XINFO 6215** Business Analysis and Information Engineering 4 SH
- **XINFO 7245** Agile Software Development 4 SH
- **XINFO 7260** Business Process Engineering 4 SH
- **XINFO 7285** Statistical Quality Control 4 SH
- **XINFO 7290** Reliability Analysis and Risk Assessment 4 SH
- **XIE 5400** Healthcare Systems Modeling and Analysis 4 SH
- **XIE 5500** Systems Engineering in Public Programs 4 SH
- **XOR 7230** Probabilistic Operation Research 4 SH
- **XOR 7240** Integer and Nonlinear Optimization 4 SH
- **XOR 7245** Multi-Criteria Decision Making 4 SH
- **XOR 7310** Logistics, Warehousing, and Scheduling 4 SH
- **XSCHM 6210** Supply Chain Management 3 SH
- **XSCHM 6211** The Transportation Industries 3 SH
- **XSCHM 6212** Executive Roundtable in Supply Chain Management 3 SH
- **XSCHM 6213** Global Supply Chain Management 3 SH
- **XSCHM 6215** IT Applications in Supply Chain Management 3 SH
- **XTECE 6200** Innovation and Entrepreneurial Growth 3 SH
- **XTECE 6222** Emerging and Disruptive Technologies 3 SH
- **XTECE 6230** Entrepreneurial Marketing and Selling 3 SH
- **XTECE 6340** The Technical Entrepreneur as Leader 3 SH
- **XTECE 6250** Lean Design and Development 3 SH
Complete two of the following courses (8 semester hours):  

- **INFO 7390** Advances in Data Sciences and Architecture 4 SH  
  - ENTR 6219 Financing Ventures from Early Stage to Exit 3 SH  
  - GE 5100 Product Development for Engineers 4 SH  
  - IE 5400 Healthcare Systems Modeling and Analysis 4 SH  
- **MGSC 6206** Management of Service and Manufacturing Operations 3 SH  
  - OR 7230 Probabilistic Operation Research 4 SH  
  - OR 7235 Inventory Theory 4 SH  
  - OR 7240 Integer and Nonlinear Optimization 4 SH  
  - OR 7245 Network Analysis and Advanced Optimization 4 SH  
- **OR 7250** Multi-Criteria Decision Making 4 SH  
  - OR 7310 Logistics, Warehousing, and Scheduling 4 SH  
  - SCHM 6210 Supply Chain Management 3 SH  
  - SCHM 6211 The Transportation Industries 3 SH  
  - SCHM 6212 Executive Roundtable in Supply Chain Management 3 SH  
  - SCHM 6213 Global Supply Chain Management 3 SH  
  - SCHM 6215 IT Applications in Supply Chain Management 3 SH  
  - TECE 6200 Innovation and Entrepreneurial Growth 3 SH  
  - TECE 6222 Emerging and Disruptive Technologies 3 SH  
- **TECE 6230** Entrepreneurial Marketing and Selling 3 SH  
  - TECE 6234 The Technical Entrepreneur as Leader 3 SH  
  - TECE 6250 Lean Design and Development 3 SH  
  - TECE 6300 Managing a Technology-Based Business 3 SH  
  - TELE 5310 Fundamentals of Communication Systems 4 SH  
  - TELE 5330 Data Networking 4 SH  
  - PROJECT Master’s Project 4 SH  
  - EMGT 7945 Management of Service and Manufacturing Operations 4 SH  

**Thesis Option**

- **INFO 7390** Advances in Data Sciences and Architecture 4 SH  
  - ENTR 6219 Financing Ventures from Early Stage to Exit 3 SH  
  - GE 5100 Product Development for Engineers 4 SH  
  - IE 5400 Healthcare Systems Modeling and Analysis 4 SH  
  - OR 7230 Probabilistic Operation Research 4 SH  
  - OR 7235 Inventory Theory 4 SH  
  - OR 7240 Integer and Nonlinear Optimization 4 SH  
  - OR 7245 Network Analysis and Advanced Optimization 4 SH  
  - OR 7250 Multi-Criteria Decision Making 4 SH  
  - OR 7310 Logistics, Warehousing, and Scheduling 4 SH  
  - SCHM 6210 Supply Chain Management 3 SH  
  - SCHM 6211 The Transportation Industries 3 SH  
  - SCHM 6212 Executive Roundtable in Supply Chain Management 3 SH  
  - SCHM 6213 Global Supply Chain Management 3 SH  
  - SCHM 6215 IT Applications in Supply Chain Management 3 SH  
  - TECE 6200 Innovation and Entrepreneurial Growth 3 SH  

**ELECTIVES**

Complete two of the following courses (8 semester hours):  

- **CSYE 6200** Concepts of Object-Oriented Design 4 SH  
  - CSYE 6210 Component Software Development 4 SH  
  - CSYE 6220 Enterprise Software Design 4 SH  
  - CSYE 7230 Software Engineering 4 SH  
  - CSYE 7270 Building Virtual Environments 4 SH  
  - CSYE 7280 Advanced User Experience Design and Testing 4 SH  
  - ENSY 5000 Fundamentals of Energy System Integration 4 SH  
  - EMGT 5300 Engineering/Organizational Psychology 4 SH  
  - EMGT 6305 Financial Management for Engineers 4 SH  
  - EMGT 7978 Independent Study 1 to 4 SH  
  - ENTR 6200 Enterprise Growth and Innovation 3 SH  
  - ENTR 6212 Business Planning for New Ventures 3 SH  
  - ENTR 6218 Business Model Design and Innovation 3 SH  

Curriculum and Graduation Requirements by Program

TECE 6250  Lean Design and Development  3 SH
TECE 6300  Managing a Technology-Based Business  3 SH
TELE 5310  Fundamentals of Communication Systems  4 SH
TELE 5330  Data Networking  4 SH

THESIS
Requires 8 semester hours:
EMGT 7990  Thesis  1 to 8 SH

Engineering Leadership Option
Students completing this option receive the graduate certificate in engineering leadership in addition to the master’s degree.

LEADERSHIP
ENLR 5121  Engineering Leadership 1  2 SH
ENLR 5122  Engineering Leadership 2  2 SH

FOUNDATIONS
ENLR 5131  Scientific Foundations of Engineering 1  2 SH
ENLR 5132  Scientific Foundations of Engineering 2  2 SH

PROJECT
ENLR 7440  Engineering Leadership Challenge Project 1  4 SH
ENLR 7442  Engineering Leadership Challenge Project 2  4 SH

Hybrid/Online Option
Complete four of the following courses:
CIVE 5270  Environmental Protection and Management  4 SH
EMGT 5300  Engineering/Organizational Psychology  4 SH
EMGT 6305  Financial Management for Engineers  4 SH
ENSY 5000  Fundamentals of Energy System Integration  4 SH
IE 5620  Mass Customization  4 SH
IE 7200  Supply Chain Engineering  4 SH
IE 7280  Statistical Methods in Engineering  4 SH
IE 7285  Statistical Quality Control  4 SH
IE 7315  Human Factors Engineering  4 SH
INFO 6210  Data Management and Database Design  4 SH
INFO 7245  Agile Software Development  4 SH
ME 5645  Environmental Issues in Manufacturing and Product Use  4 SH
OR 7230  Probabilistic Operation Research  4 SH
OR 7310  Logistics, Warehousing, and Scheduling  4 SH

PROGRAM CREDIT/GPA REQUIREMENTS
32 total semester hours required
Minimum 3.000 GPA required