MANUFACTURING SYSTEMS ENGINEERING: MANUFACTURING SYSTEMS ENGINEERING, M.S.

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/policiesandrequirementstext), in addition to the program requirements listed below.

NAMED OPTION REQUIREMENTS

MODE OF INSTRUCTION

<table>
<thead>
<tr>
<th>Face to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Mode of Instruction Definitions

Accelerated: Accelerated programs are offered at a fast pace that condenses the time to completion. Students are able to complete a program with minimal disruptions to careers and other commitments.

Evening/Weekend: Courses meet on the UW–Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

Face-to-Face: Courses typically meet during weekdays on the UW-Madison Campus.

Hybrid: These programs combine face-to-face and online learning formats. Contact the program for more specific information.

Online: These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

CURRICULAR REQUIREMENTS

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Credit</td>
<td>30 credits</td>
</tr>
<tr>
<td>Minimum Residence</td>
<td>16 credits</td>
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</table>

Minimum 15 credits must be graduate-level coursework. Details can be found in the Graduate School's Minimum Graduate Coursework Requirement (https://policy.wisc.edu/library/UW-1244/). The department recommends taking coursework in College of Engineering, the School of Business, the Department of Statistics, the Department of Biological Systems Engineering, or the Department of Computer Sciences.

Overall 3.00 GPA required.

Graduate GPA Requirement

This program follows the Graduate School's policy: https://policy.wisc.edu/library/UW-1203/.

Other Grade Requirements

Grades of C or lower do not count toward the degree.

Assessments and Examinations

The research-thesis track requires student to submit a thesis and defend to a committee of faculty. The industry-thesis track requires students to submit an industry thesis and defend it to a committee of faculty. The course-only track does not require a thesis.

Language Requirements

No language requirements.

REQUIRED COURSES

The on-campus Manufacturing Systems Engineering M.S. program has three tracks: course only, industrial thesis, and research thesis. Students must take four courses from the core course areas with at least one course from each of the core course areas. All students are required to take the capstone course I SYE/M E 641 Design and Analysis of Manufacturing Systems. The remaining course requirements vary depending on the program track that is chosen and are described in the table below.

Course Only Track

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>I SYE/M E 641</td>
<td>Design and Analysis of Manufacturing Systems (Offered in spring semester)</td>
<td>3</td>
</tr>
<tr>
<td>Elective Courses (400 level and above)</td>
<td>15</td>
<td></td>
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</tbody>
</table>

Total Credits 30

1 These tracks are internal to the program and represent different pathways a student can follow to earn this degree. Track names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

2 At least one course must be selected from each of the three core areas.

3 Up to one credit of I SYE 702 or M E 702 for an internship may count as elective credit toward the degree. A written report must be approved by the advisor. This credit cannot be used toward fulfillment of the Thesis Requirement in the Industry Thesis or Research Thesis tracks.
Industry Thesis Track ¹

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>I SY E/M E 641</td>
<td>Design and Analysis of Manufacturing Systems (Offered in spring semester)</td>
<td>3</td>
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</table>

Research Thesis

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>I SY E 702</td>
<td>Manufacturing Systems Engineering, M.S.</td>
<td>3</td>
</tr>
<tr>
<td>M E 417</td>
<td>Engineering Design with Polymers</td>
<td>3</td>
</tr>
<tr>
<td>M E 418</td>
<td>Engineering Design with Polymers</td>
<td>3</td>
</tr>
<tr>
<td>M E 419</td>
<td>Fundamentals of Injection Molding</td>
<td>3</td>
</tr>
<tr>
<td>M E 429</td>
<td>Metal Cutting</td>
<td>3</td>
</tr>
<tr>
<td>M E 437</td>
<td>Advanced Materials Selection</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 415</td>
<td>Introduction to Manufacturing Systems, Design and Analysis</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 605</td>
<td>Computer Integrated Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>M E 417</td>
<td>Transport Phenomena in Polymer Processing</td>
<td>3</td>
</tr>
<tr>
<td>M E 418</td>
<td>Engineering Design with Polymers</td>
<td>3</td>
</tr>
<tr>
<td>M E 419</td>
<td>Fundamentals of Injection Molding</td>
<td>3</td>
</tr>
<tr>
<td>M E 429</td>
<td>Metal Cutting</td>
<td>3</td>
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<tr>
<td>M E 437</td>
<td>Advanced Materials Selection</td>
<td>3</td>
</tr>
<tr>
<td>M E 445</td>
<td>Mechatronics in Control &amp; Product Realization</td>
<td>3</td>
</tr>
<tr>
<td>M E 446</td>
<td>Automatic Controls</td>
<td>3</td>
</tr>
<tr>
<td>M E 447</td>
<td>Computer Control of Machines and Processes</td>
<td>3</td>
</tr>
<tr>
<td>M E 449</td>
<td>Redesign and Prototype Fabrication</td>
<td>3</td>
</tr>
<tr>
<td>M E 469</td>
<td>Internal Combustion Engines</td>
<td>3</td>
</tr>
<tr>
<td>M E 514</td>
<td>Additive Manufacturing</td>
<td>3</td>
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<tr>
<td>M E/N E 565</td>
<td>Power Plant Technology</td>
<td>3</td>
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<tr>
<td>M E/CBE 567</td>
<td>Solar Energy Technology</td>
<td>3</td>
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<tr>
<td>M E/E C E 577</td>
<td>Automatic Controls Laboratory</td>
<td>4</td>
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<tr>
<td>M E 717</td>
<td>Advanced Polymer Processing</td>
<td>3</td>
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<tr>
<td>M E/E C E 739</td>
<td>Advanced Robotics</td>
<td>3</td>
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<tr>
<td>M E 747</td>
<td>Advanced Computer Control of Machines and Processes</td>
<td>3</td>
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<tr>
<td>M S &amp; E 434</td>
<td>Introduction to Thin-Film Deposition Processes</td>
<td>3</td>
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<tr>
<td>M S &amp; E 461</td>
<td>Advanced Metal Casting</td>
<td>3</td>
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<tr>
<td>M S &amp; E/M E 462</td>
<td>Welding Metallurgy</td>
<td>3</td>
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<tr>
<td>M S &amp; E 465</td>
<td>Fundamentals of Heat Treatment</td>
<td>3</td>
</tr>
<tr>
<td>N E 405</td>
<td>Nuclear Reactor Theory</td>
<td>3</td>
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Fundamentals of Systems Engineering and Design

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CBE 430</td>
<td>Chemical Kinetics and Reactor Design</td>
<td>3</td>
</tr>
<tr>
<td>CIV ENGR 370</td>
<td>Transportation Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CIV ENGR 498</td>
<td>Construction Project Management</td>
<td>3</td>
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<tr>
<td>COMP SCI/E C E 755</td>
<td>VLSI Systems Design</td>
<td>3</td>
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<tr>
<td>COMP SCI/E C E 756</td>
<td>Computer-Aided Design for VLSI</td>
<td>1</td>
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<tr>
<td>E C E 427</td>
<td>Electric Power Systems</td>
<td>3</td>
</tr>
<tr>
<td>M E 418</td>
<td>Engineering Design with Polymers</td>
<td>3</td>
</tr>
<tr>
<td>M E 444</td>
<td>Design Problems in Elasticity</td>
<td>3</td>
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<tr>
<td>M E 535</td>
<td>Computer-Aided Geometric Design</td>
<td>3</td>
</tr>
<tr>
<td>M E 549</td>
<td>Product Design</td>
<td>3</td>
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<tr>
<td>M E 748</td>
<td>Optimum Design of Mechanical Elements and Systems</td>
<td>3</td>
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<td>MARKETNG/ OTM 427</td>
<td>Information Technology in Supply Chains</td>
<td>3</td>
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<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
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<tr>
<td>MARKETNG/OTM 727</td>
<td>Information Technology in Supply Chains</td>
<td>3</td>
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<tr>
<td>I SY E 412</td>
<td>Fundamentals of Industrial Data Analytics</td>
<td>3</td>
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<tr>
<td>I SY E/M E 510</td>
<td>Facilities Planning</td>
<td>3</td>
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<tr>
<td>I SY E/M E 512</td>
<td>Inspection, Quality Control and Reliability</td>
<td>3</td>
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<tr>
<td>I SY E 515</td>
<td>Engineering Management of Continuous Process Improvement</td>
<td>3</td>
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<tr>
<td>I SY E 516</td>
<td>Introduction to Decision Analysis</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 520</td>
<td>Quality Assurance Systems</td>
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</tr>
<tr>
<td>I SY E/COMP SCI/ECE 524</td>
<td>Introduction to Optimization</td>
<td>3</td>
</tr>
<tr>
<td>I SY E/B M E 564</td>
<td>Occupational Ergonomics and Biomechanics</td>
<td>3</td>
</tr>
<tr>
<td>I SY E 575</td>
<td>Introduction to Quality Engineering</td>
<td>3</td>
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<tr>
<td>I SY E 601</td>
<td>Special Topics in Industrial Engineering</td>
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<tr>
<td>I SY E 602</td>
<td>Special Topics in Human Factors</td>
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<tr>
<td>I SY E 603</td>
<td>Special Topics in Engineering Analytics and Operations Research</td>
<td>1-3</td>
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<tr>
<td>I SY E 612</td>
<td>Information Sensing and Analysis for Manufacturing Processes</td>
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<tr>
<td>I SY E 620</td>
<td>Simulation Modeling and Analysis</td>
<td>3</td>
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<tr>
<td>I SY E/M E 643</td>
<td>Performance Analysis of Manufacturing Systems</td>
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<tr>
<td>I SY E 645</td>
<td>Engineering Models for Supply Chains</td>
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<tr>
<td>OTM 654</td>
<td>Production Planning and Control</td>
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<tr>
<td>STAT/M E 424</td>
<td>Statistical Experimental Design</td>
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**Fundamentals of Business and Management**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ACCT I S 300</td>
<td>Accounting Principles</td>
<td>3</td>
</tr>
<tr>
<td>ACCT I S 710</td>
<td>Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>FINANCE/ECON 300</td>
<td>Introduction to Finance</td>
<td>3</td>
</tr>
<tr>
<td>FINANCE 720</td>
<td>Investment Theory and Practice</td>
<td>3</td>
</tr>
<tr>
<td>FINANCE 757</td>
<td>Entrepreneurial Finance</td>
<td>1,3</td>
</tr>
<tr>
<td>I SY E/PSYCH 653</td>
<td>Organization and Job Design</td>
<td>3</td>
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<tr>
<td>M H R 700</td>
<td>Organizational Behavior</td>
<td>3</td>
</tr>
<tr>
<td>M H R 710</td>
<td>Challenges &amp; Solutions in Business Sustainability</td>
<td>3</td>
</tr>
<tr>
<td>M H R 715</td>
<td>Strategic Management of Innovation</td>
<td>1,3</td>
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<tr>
<td>M H R 722</td>
<td>Entrepreneurial Management</td>
<td>1,3</td>
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<tr>
<td>M H R 723</td>
<td>Business Strategy</td>
<td>3</td>
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<tr>
<td>M H R 734</td>
<td>Venture Creation</td>
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<tr>
<td>M H R 741</td>
<td>Technology Entrepreneurship</td>
<td>3</td>
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<tr>
<td>MARKETNG 300</td>
<td>Marketing Management</td>
<td>3</td>
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<tr>
<td>MARKETNG/OTM 421</td>
<td>Fundamentals of Supply Chain</td>
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<tr>
<td>MARKETNG/OTM 722</td>
<td>Logistics Management</td>
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<td>MARKETNG/OTM 724</td>
<td>Strategic Global Sourcing</td>
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<tr>
<td>OTM 752</td>
<td>Project Management</td>
<td>3</td>
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</table>

OTM 758 Managing Technological and Organizational Change

1 Most 700-level courses are only taught every three or four semesters. Please check with instructor about the next offering before completing study plan.
2 This course number is used for multiple seminar classes. Please talk to your advisor to confirm a specific topic will count.
3 This course is offered in variable credit versions. Manufacturing Systems Engineering students must register for a 3-credit section.