ENGINEERING MANAGEMENT, MASTER OF SCIENCE

http://engineering.jhu.edu/msem/

The Master of Science in Engineering Management (MSEM) degree program combines advanced course work in highly-specialized technical fields with a professional education in contemporary business, entrepreneurship, and management practices. Graduates of the program will be provided with the educational background to pursue professional management roles in industry.

Facilities

The MSEM program has a dedicated seminar room housed in Wyman. Students are able to study, conduct research and build prototypes within this space.

Graduate Requirements

Please consult directly with the MSEM program director or MSEM academic advisor to confirm the below requirements; changes may have occurred since this annual publication.

Students in the MSEM program take ten courses to fulfill degree requirements, with the following guidelines:

- Five advanced courses in the engineering technical track
- Three full-fall semester management courses, fall and spring MSEM Seminar courses, two half-semester required courses in the spring. plus students may choose from a list of approved half-semester courses to complete their elective, in addition to EN.662.643, The Practice of Consulting, taken during the intersession.
- No grade lower than C may be applied to the program
- Courses must be at the graduate level
- Departments sponsoring technical tracks may impose stricter requirements for course work within the track.
- Students are additionally required to complete EN.500.603 Graduate Orientation and Academic Ethics, which does not count towards the degree requirements above.

At the discretion of the student's advisors, an MSEM student may be permitted to double-count up to two JHU courses, or apply graduate courses taken at JHU or elsewhere but not applied to a degree, in accordance with conditions in the WSE Policy on Double-Counting Courses.

Advising

MSEM students will receive advising on the technical track from a designated faculty member affiliated with that track. MSEM students will be advised regarding the management track by members of the Center for Leadership Education faculty.

Faculty

Faculty members teaching the technical track courses are listed in their respective engineering departments elsewhere in this catalogue. Faculty members teaching the management track courses are listed in the Center for Leadership Education section of this catalogue.

Program Requirements

Management Track

The Center for Leadership Education has constructed a five-course program tailored to the needs of future engineering managers. MSEM students will participate in a cohort program, which begins each fall, where all students in an entering class will take the following a suite of management courses together.

In addition, all MSEM students are required to attend the MSEM Seminar EN.662.811 M.S. in Engineering Management Seminar/EN.662.812 MSEM Seminar) course while enrolled in the program. This will meet weekly and addresses three important content areas: Innovation and design thinking; personal skills and development especially in the communication arena; and talks with practicing engineering managers. The Engineering Management program reserves the right to change the list of eligible courses at its discretion.

Technical Tracks

In addition to fulfilling the management track requirements, MSEM students must complete the requirements for one of the technical tracks. These are:

- Biomaterials
- Chemical & Biomolecular Engineering
- Chemical Product Design
- Civil Engineering
- Communications Science
- Computer Science
- Cybersecurity
- Energy
- Environmental Systems Analysis, Economics and Public Policy
- Fluid Mechanics
- Materials Science and Engineering
- Mechanical Engineering
- Mechanics and Materials
- Nano-Biotechnology
- Nanomaterials and Nanotechnology
- Operations Research
- Probability and Statistics
- Smart Product and Device Design
- Systems Engineering
- Space Systems Engineering, Engineering for Professionals

Biomaterials

*(Sponsored by the Department of Materials Science & Engineering (https://e-catalogue.jhu.edu/engineering/materials-science-engineering/))*

Prerequisites

- UG calculus, chemistry, biology, physics and introductory biomaterials course equivalent to EN.510.316 Biomaterials I

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN.510.607</td>
<td>Biomaterials II: Host response and biomaterials applications</td>
<td>3</td>
</tr>
</tbody>
</table>
Biomolecular Materials I - Soluble Proteins and Amphiphiles

Total Credits 6

Substitutions for required courses can be made at the advisor’s discretion.

Electives
- Electives should be related to Materials Science and Engineering and must be approved by the DMSE graduate committee
- See list of pre-approved elective courses or courses off list by petition

List of Pre-approved Electives

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN.510.400</td>
<td>Introduction to Ceramics</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.403</td>
<td>Materials Characterization</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.405</td>
<td>Materials Science of Energy Technologies</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.422</td>
<td>Micro and Nano Structured Materials &amp; Devices</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.426</td>
<td>Biomolecular Materials I - Soluble Proteins and Amphiphiles</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.428</td>
<td>Material Science Laboratory I</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.429</td>
<td>Material Science Laboratory II</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.430</td>
<td>Biomaterials Lab</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.604</td>
<td>Mechanical Properties of Materials</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.605</td>
<td>Electrical, Optical and Magnetic Properties of Materials</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.607</td>
<td>Biomaterials II: Host response and biomaterials applications</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.657</td>
<td>Materials Science of Thin Films</td>
<td>3</td>
</tr>
</tbody>
</table>

Courses not on this list can be used at the advisor’s discretion.

Civil Engineering
(Sponsored by the Department of Civil Engineering (https://e-catalogue.jhu.edu/engineering/civil-engineering/))

The Civil Engineering track for the Master of Science in Engineering Management consists of five courses, with the following guidelines:

Code         | Title                                               | Credits |
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>EN.560.730</td>
<td>Finite Element Methods</td>
<td>3</td>
</tr>
<tr>
<td>EN.560.604</td>
<td>Introduction to Solid Mechanics</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 6

Substitutions for required courses can be made at the advisor’s discretion.

Elective Courses
- Any two courses from 560.6xx or above, or 565.6xx or above (excluding seminar)

Chemical and Biomolecular Engineering
(Sponsored by the Department of Electrical & Computer Engineering (https://e-catalogue.jhu.edu/engineering/electrical-computer-engineering/))

Code         | Title                                               | Credits |
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>EN.540.673</td>
<td>Advanced Chemical Reaction Engineering in Practice</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 9

Substitutions for required courses can be made at the advisor’s discretion.

Elective Courses: Any two courses from 540.6xx or above, or 545.6xx or above (excluding seminar)

Courses not on this list can be approved at the advisor’s discretion.

Chemical Product Design
(Sponsored by the Department of Chemical and Biomolecular Engineering (https://e-catalogue.jhu.edu/engineering/chemical-biomolecular-engineering/))

Students must take five courses:
- Two semesters of Product Design EN.540.690 Chemical and Biomolecular Engineering Design-EN.540.691 Product Design 1
- Two ChemBE Courses (540.6xx)
- One approved elective in Engineering, Science, Math, or Applied Math

Substitutions for courses can be made at the advisor’s discretion.

Communications Science
(Sponsored by the Department of Electrical & Computer Engineering (https://e-catalogue.jhu.edu/engineering/electrical-computer-engineering/))

Students may select any combination of 5 courses in communications and related fields from the list below.

Code         | Title                                               | Credits |
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>EN.520.435</td>
<td>Digital Signal Processing</td>
<td>3</td>
</tr>
<tr>
<td>EN.520.447</td>
<td>Information Theory</td>
<td>3</td>
</tr>
<tr>
<td>EN.520.646</td>
<td>Wavelets &amp; Filter Banks</td>
<td>3</td>
</tr>
<tr>
<td>EN.520.651</td>
<td>Foundations of Probabilistic Machine Learning</td>
<td>4</td>
</tr>
<tr>
<td>EN.520.652</td>
<td>Filtering and Smoothing</td>
<td>3</td>
</tr>
<tr>
<td>EN.520.666</td>
<td>Information Extraction</td>
<td>3</td>
</tr>
<tr>
<td>EN.520.735</td>
<td>Sensory Information Processing</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 22

Substitutions for required courses can be made at the advisor’s discretion.

Computer Science
(Sponsored by the Department of Computer Science (https://e-catalogue.jhu.edu/engineering/computer-science/))

Curricular Requirements
- Any five regular graduate courses approved by the advisor, 400-level or higher, from the Department of Computer Science, not including the senior thesis. Three 1-credit graduate courses may be combined to constitute one regular graduate course.

Cybersecurity
(Sponsored by the Information Security Institute)

Pre-Requisites:
• Entering students are expected to have completed a program of study equivalent to that required by at least an undergraduate minor in computer science and a computer science BS is recommended.
• Applicants from other disciplines must have coursework (or equivalent experience) in Computer System Fundamentals, Programming, Data Structures, and Discrete Math.
• If the necessary background courses are lacking, students must take undergraduate courses to possess these prerequisites. These courses will not count toward the MSEM degree but will appear on the transcript.

Curricular Requirements (5):

• A combination of five graduate courses, 600-level or higher, are taken from the Information Security Institute required as below:
  • Two courses from the Core Technology and/or the Elective Technology course lists;
  • One Core Policy course and one Core Management course;
  • The fifth course from any of the above course categories.
• No more than three graduate-level courses by the Information Security Institute may be taken in one semester by an MSEM student in this track.

Energy
(Sponsored by the Department of (https://e-catalogue.jhu.edu/engineering/mechanical-engineering/) Environmental Health & Engineering (https://ehe.jhu.edu/))

Required Courses:

Approval of substitutions for required courses are at the discretion of the technical advisor.

Energy Technology Group: choose at least 1
030.404 Electrochemical Systems for Energy Conversion and Storage
510.405 Materials Science of Energy Technologies
510.627 Photovoltaics and Energy Devices
540.619 Projects in Design: Alternative Energy
540.630 Thermodynamics, Statistical Mechanics and Kinetics

Systems Management Group: choose at least 1
520.629 Networked Dynamical Systems
530.664 Energy Systems Analysis
570.607 Energy Policy and Planning Models
570.697 Risk and Decision Analysis

Electives: (choose up to 3)
030.403 Optoelectronic Materials and Devices: Synthesis, Spectroscopy, and Applications
271.402 Water, Energy and Food
410.777 Biofuels
425.604 Energy and Climate Finance
420.616 Environmental Consequences of Conventional Energy Generation
425.601 Principles and Applications of Energy Technology
425.625 Solar Energy: Science, Technology and Policy
425.640 The Future of the US Electric System in a Carbon-Constrained World
530.629 Simulation and Analysis of Ocean Wave Energy Systems
570.657 Air Pollution
570.695 Environmental Health and Engineering Systems Design
615.448 Alternative Energy Technology
680.697 Global Energy Fundamentals
680.714 Energy, Environment and Development in Developing Countries
680.730 Global Electricity Markets
680.790 Principles of Energy Economics and Finance

680.792 The Water, Energy and Food Nexus
680.855 Life Cycle Assessment
680.852 Energy Poverty
810.761 Energy in the Americas: Conflict, Cooperation and Future Prospects

Other elective courses must be approved at the advisor’s discretion.

Fluid Mechanics
(Sponsored by the Department of Mechanical Engineering (https://e-catalogue.jhu.edu/engineering/mechanical-engineering/))

Any five courses in Fluid Mechanics or closely related discipline, at the 400-level or higher, as approved by the Faculty advisor. At least two of the required track courses must be at the 600-level or higher.

Materials Science & Engineering
(Sponsored by the Department of Materials Science & Engineering (https://e-catalogue.jhu.edu/engineering/materials-science-engineering/))

Prerequisites
• UG calculus, chemistry and physics; biology is recommended

Code Title Credits
EN.510.601 Structure Of Materials 3

Total Credits 3

Substitutions for required courses can be made at the advisor’s discretion.

Electives
• See list of pre-approved elective courses or courses off list by petition

Recommended Structure

Code Title Credits
EN.510.400 Introduction to Ceramics 3
EN.510.403 Materials Characterization 3
EN.510.405 Materials Science of Energy Technologies 3
EN.510.422 Micro and Nano Structured Materials & Devices 3
EN.510.426 Biomolecular Materials I - Soluble Proteins and Amphipiles 3
EN.510.428 Material Science Laboratory I 3
EN.510.429 Materials Science Laboratory II 3
EN.510.430 Biomaterials Lab 3
EN.510.604 Mechanical Properties of Materials 3
EN.510.605 Electrical, Optical and Magnetic Properties of Materials 3
EN.510.607 Biomaterials II: Host response and biomaterials applications 3
EN.510.657 Materials Science of Thin Films 3

Alternative selections can be made at the advisor’s discretion.

Mechanical Engineering
(Sponsored by the Department of Mechanical Engineering (https://e-catalogue.jhu.edu/engineering/mechanical-engineering/))

Code Title Credits
EN.510.430 Biomaterials Lab 3
Required Courses
Any five courses in Mechanical Engineering or closely related discipline at the 400-level or higher, as approved by the Faculty advisor. At least two of the required technical courses must be at the 600-level or higher.

Alternative selections can be made at the advisor’s discretion.

Mechanics and Materials
(Sponsored jointly by the Department of Mechanical Engineering (https://e-catalogue.jhu.edu/engineering/mechanical-engineering/) and the Department of Materials Science & Engineering (https://e-catalogue.jhu.edu/engineering/materials-science-engineering/))

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN.510.601</td>
<td>Structure Of Materials</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.604</td>
<td>Mechanical Properties of Materials</td>
<td>3</td>
</tr>
</tbody>
</table>

Substitutions for required courses can be made at the advisor’s discretion.

Elective Courses
Any two (2) of the following courses, approved by the faculty advisor:

<table>
<thead>
<tr>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>EN.510.403</td>
<td>Materials Characterization</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.428</td>
<td>Material Science Laboratory I</td>
<td>3</td>
</tr>
<tr>
<td>EN.530.405</td>
<td>Mechanics of Advanced Engineering Structures</td>
<td>3</td>
</tr>
<tr>
<td>EN.530.414</td>
<td>Computer-Aided Design</td>
<td>3</td>
</tr>
<tr>
<td>EN.530.418</td>
<td>Aerospace Structures</td>
<td>3</td>
</tr>
<tr>
<td>EN.530.602</td>
<td>Thermodynamics Of Materials</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.603</td>
<td>Phase Transformations of Materials</td>
<td>3</td>
</tr>
<tr>
<td>EN.530.612</td>
<td>Computational Solid Mechanics</td>
<td>3</td>
</tr>
</tbody>
</table>

Alternative selections can be made at the advisor’s discretion.

Nano-Biotechnology
(Sponsored by the Department of Materials Science & Engineering (https://e-catalogue.jhu.edu/engineering/materials-science-engineering/))

Prerequisites
- UG calculus, chemistry, biology, physics and introductory biomaterials course equivalent to Biomaterials I (EN.510.316)

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<tr>
<th>Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>EN.510.422</td>
<td>Micro and Nano Structured Materials &amp; Devices</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.607</td>
<td>Biomaterials II: Host response and biomaterials applications</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 6

Nanomaterials and Nanotechnology
(Sponsored by the Department of Materials Science & Engineering (https://e-catalogue.jhu.edu/engineering/materials-science-engineering/))

Prerequisites
- UG calculus, chemistry, and physics

<table>
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<tr>
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<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN.510.422</td>
<td>Micro and Nano Structured Materials &amp; Devices</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 3

Substitutions for required courses can be made at the advisor’s discretion.

Electives
- Electives should be related to Materials Science and Engineering and must be approved by the DMSE graduate committee
- See list of pre-approved elective courses or courses off list by petition

Recommended Structure

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN.510.422 (Required)</td>
<td>Micro and Nano Structured Materials &amp; Devices</td>
<td>3</td>
</tr>
</tbody>
</table>

See list of pre-approved elective courses or courses off list by petition

Electives in Spring: suggest two

Total Credits 3

List of Pre-approved Electives

<table>
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<tr>
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<td>EN.510.428</td>
<td>Material Science Laboratory I</td>
<td>3</td>
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<tr>
<td>EN.510.429</td>
<td>Material Science Laboratory II</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.430</td>
<td>Biomaterials Lab</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.604</td>
<td>Mechanical Properties of Materials</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.605</td>
<td>Electrical, Optical and Magnetic Properties of Materials</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.607</td>
<td>Biomaterials II: Host response and biomaterials applications</td>
<td>3</td>
</tr>
<tr>
<td>EN.510.657</td>
<td>Materials Science of Thin Films</td>
<td>3</td>
</tr>
</tbody>
</table>

Alternative selections can be made at the advisor’s discretion.
Any five courses from the following list, or a substitution as approved
appropriate mathematical or statistical content can be counted to
with advisor’s approval, one non-departmental course containing
satisfy the five course requirement.
• An overall GPA of 3.0 must be maintained in courses used to meet the
program’s technical requirements. At most two course grades of C or
• Students must satisfy the department’s graduate student computing
requirement.
• With advisor’s approval, one non-departmental course containing
appropriate mathematical or statistical content can be counted to
satisfy the five course requirement.

Smart Product and Device Design
(Sponsored jointly by the Department of Mechanical Engineering
and the Department of Electrical & Computer Engineering)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN.530.646</td>
<td>Risk Measurement/Management in Financial Markets</td>
<td>4</td>
</tr>
<tr>
<td>EN.553.647</td>
<td>Quantitative Portfolio Theory and Performance Analysis</td>
<td>4</td>
</tr>
<tr>
<td>EN.553.648</td>
<td>Financial Engineering and Structured Products</td>
<td>4</td>
</tr>
</tbody>
</table>

Alternative selections can be made at the advisor’s discretion.

Probability and Statistics
(Sponsored by the Department of Applied Mathematics & Statistics)

Admissions Requirements
• One upper-division undergraduate course in probability (equivalent to
EN.553.420 Introduction to Probability)
• One upper-division undergraduate course in mathematical statistics
(equivalent to EN.553.430 Introduction to Statistics)

Curricular Requirements
Any five (5) of the following courses, approved by the faculty advisor:

Additional Requirements
• An overall GPA of 3.0 must be maintained in courses used to meet the
program’s technical requirements. At most two course grades of C or
• Students must satisfy the department’s graduate student computing
requirement.
• With advisor’s approval, one non-departmental course containing
appropriate mathematical or statistical content can be counted to
satisfy the five course requirement.

Smart Product and Device Design
(Sponsored jointly by the Department of Mechanical Engineering
and the Department of Electrical & Computer Engineering)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN.530.646</td>
<td>Robot Devices, Kinematics, Dynamics, and Control</td>
<td>4</td>
</tr>
<tr>
<td>EN.530.414</td>
<td>Computer-Aided Design</td>
<td>3</td>
</tr>
<tr>
<td>or EN.520.491</td>
<td>CAD Design of Digital VLSI Systems I (Juniors/ Seniors)</td>
<td>3</td>
</tr>
<tr>
<td>EN.530.421</td>
<td>Mechatronics</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits

Substitutions for required courses can be made at the advisor’s discretion.

Elective Courses
Any two (2) courses approved by the faculty advisor.

Environmental Systems Analysis, Economics and Public Policy
(Sponsored by the Department of Environmental Health and Engineering)

Required Courses
At least one course from each of the three following groups:
• **Economics** (with calculus)— This requirement may be waived if the student has already had an intermediate microeconomics course accepted by their advisor

• **Mathematics of Decision Making**—acceptable courses include EN.570.495 and EN.570.497 Risk and Decision Analysis

• **Policy**— EN.570.607 Energy Policy and Planning Models

Substitutions for required courses can be made at the advisor’s discretion.

**Elective Courses**

Any of the courses listed in the Mandatory list (see Part A above)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN.570.496</td>
<td>Urban and Environmental Systems</td>
<td>3</td>
</tr>
<tr>
<td>EN.570.618</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

Other courses in environmental economics, systems, or policy, as approved by the advisor.

**ADDITIONAL NOTES**

• All courses must be approved by the student’s advisor.

• All course must be at the graduate level

• Students with a background in quantitatively rigorous economics sufficient for the economics requirement to be waived must still take five (5) courses in this track.

• No more than one course in environmental engineering may be used to fulfill the track and only with careful consultation with the student’s advisor. Candidate courses in environmental engineering include:

  - EN.570.446 Biological Process of Wastewater Treatment
  - EN.570.490 Solid Waste Engineering and Management
  - EN.570.491 Hazardous Waste Engineering and Management
  - EN.570.647 Hydrologic Transport in the Environment
  - EN.570.657 Air Pollution, etc.

**Systems Engineering**

(Sponsored by the Department of Systems Engineering)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EN.560.610</td>
<td>Systems Engineering for Space</td>
<td></td>
</tr>
<tr>
<td>EN.560.611</td>
<td>Fundamentals of Engineering Spaces Systems I</td>
<td></td>
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</tbody>
</table>

Elective Courses

Three courses from any combination of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EN.560.xx or above, or EN.565.xx or above (excluding seminar)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EN.645.6xx or above (EP Systems Engineering)</td>
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<tr>
<td>EN.570.495</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>EN.553.761</td>
<td>Nonlinear Optimization I</td>
<td>3</td>
</tr>
<tr>
<td>EN.570.497</td>
<td>Risk and Decision Analysis</td>
<td>3</td>
</tr>
<tr>
<td>EN.553.400</td>
<td>Mathematical Modeling and Consulting</td>
<td>4</td>
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<tr>
<td>EN.570.496</td>
<td>Urban and Environmental Systems</td>
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<td>EN.570.607</td>
<td>Energy Policy and Planning Models</td>
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<tr>
<td>EN.663.653</td>
<td>Innovation and Design I</td>
<td>3</td>
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<tr>
<td>EN.663.657</td>
<td>Innovation and Design II</td>
<td>3</td>
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</tbody>
</table>

• No more than one C may be used toward the degree in this track.

**SPACE SYSTEMS ENGINEERING, ENGINEERING FOR PROFESSIONALS PROGRAM**

(Sponsored by the Engineering for Professionals Program)

Required Courses:

• 675.600 Systems Engineering for Space
• 675.601 Fundamentals of Engineering Spaces Systems I

Elective Courses

Three courses from any combination of 675.xxx

• Substitutions for courses can be made at the advisor’s discretion.

For current faculty and contact information go to [http://eng.jhu.edu/wse/cle/page/our_people](http://eng.jhu.edu/wse/cle/page/our_people)