Industrial Engineering, M.S.I.E.

Curriculum in Masters of Science in Industrial Engineering

A candidate for the M.S. degree in industrial engineering must comply with the rules and regulations as outlined in the WVU Graduate Catalog and the specific requirements of the Statler College and the Industrial and Management Systems Engineering Department.

Program Requirements

All M.S. degree candidates are required to perform research and follow a planned program of study. The student’s research advisor, in conjunction with the student’s Advising and Examining Committee (AEC) will be responsible for determining the plan of study appropriate to the student’s needs. The underlying principle of the planned program is to provide the students with the necessary support to complete their degree and prepare them for their career.

Curriculum Requirements

A minimum cumulative GPA of 3.0 is required in all courses

Course Requirements

A minimum of 60% of courses must be from 500 level or above

Complete one of the following options: 31-34

Thesis Option - 31 total credit hours

Complete one core course from each Area of Concentration (9 credit hours)

Complete one Area of Concentration (15 credit hours) includes: (Core Courses - 9 credit hours and Elective Courses - 6 credit hours)

IENG 697 Research (6 hours)
IENG 796 Graduate Seminar (1 credit hour)
Written Proposal
Thesis
Final Oral or Written Examination

Problem Report Option - 34 total credit hours

Complete one core course from each Area of Concentration (9 credit hours)

Complete one Area of Concentration (15 credit hours) includes: (Core Courses - 9 credit hours and Elective Courses - 6 credit hours)

Any BIOM, CE, CHE, CHEM, CPE, CS, EE, IENG, IH&S, MAE, MATH, MINE, PNGE, PHYS, SAFM, SENG, or STAT courses 400-799 as approved by the student’s AEC (6 credit hours)

IENG 697 Research (3 hours)
IENG 796 Graduate Seminar (1 credit hour)
Written Proposal
Formal written report or professional report/paper
Final Oral or Written Examination

Coursework Option - 34 total credit hours

Complete one core course from each Area of Concentration (9 credit hours)

Complete one Area of Concentration (15 credit hours) includes: (Core Courses - 9 credit hours and Elective Courses - 6 credit hours)

Any BIOM, CE, CHE, CHEM, CPE, CS, EE, IENG, IH&S, MAE, MATH, MINE, PNGE, PHYS, SAFM, SENG, or STAT courses 400-799 as approved by the student's AEC (9 credit hours)

IENG 796 Graduate Seminar (1 credit hour)
Final Oral or Written Examination

Areas of Concentration

MANUFACTURING SYSTEM

Core Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>IENG 514</td>
<td>Design of Industrial Experiments</td>
<td>3</td>
</tr>
<tr>
<td>IENG 542</td>
<td>Advanced Production Control</td>
<td>3</td>
</tr>
<tr>
<td>IENG 551</td>
<td>Quality and Reliability Engineering</td>
<td>3</td>
</tr>
<tr>
<td>IENG 577</td>
<td>Advanced Engineering Economy</td>
<td>3</td>
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Elective Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit</th>
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</thead>
<tbody>
<tr>
<td>IENG 505</td>
<td>Computer Integrated Manufacturing</td>
<td>3</td>
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</tbody>
</table>
IENG 506  Computer Aided Process Planning  3  
IENG 507  Robotics and Flexible Automation  3  
IENG 518  Technology Forecasting  3  
IENG 554  Applied Integer/Heuristic Programs  3  
IENG 556  Supply Chain Management  3  

ERGONOMICS  
Core Courses  
IENG 514  Design of Industrial Experiments  3  
IENG 564  Industrial Ergonomics  3  
IENG 577  Advanced Engineering Economy  3  
IENG 660  Human Factors System Design  3  

Elective Courses  
IENG 461  System Safety Engineering  3  
IENG 518  Technology Forecasting  3  
IENG 561  Industrial Hygiene Engineering  3  
IENG 662  Systems Safety Engineering  3  

DECISION SCIENCES & PRODUCTION SYSTEMS  
Core Courses  
IENG 455  Simulation by Digital Methods  3  
IENG 514  Design of Industrial Experiments  3  
IENG 553  Applied Linear Programming  3  
IENG 577  Advanced Engineering Economy  3  

Elective Courses  
IENG 518  Technology Forecasting  3  
IENG 554  Applied Integer/Heuristic Programs  3  
IENG 556  Supply Chain Management  3  
IENG 754  Inventory Theory  3  
IENG 756  Applied Stochastic Processes  3  

* Students who do not hold a baccalaureate degree in industrial engineering are required to take a set of undergraduate industrial engineering courses above and beyond the minimum coursework requirements.

Final Examination  
M.S. students following the thesis or problem report option must prepare a written research proposal. The proposal must be approved by the student's AEC at least one semester prior to the final oral examination.

All students, regardless of option, are required to pass a final oral or written examination, administered by their AEC, covering the thesis or problem report and/or related course material.

Suggested Plan of Study  
The plan below illustrates the Thesis Option. It is important for students to take courses in the order specified as much as possible; all prerequisites and concurrent requirements must be observed. A typical M.S.I.E degree program that completes degree requirements in two years is as follows.

First Year  
<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Core Course Area of Concentration 1</td>
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<td>Core Course Area of Concentration 1</td>
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<td>Core Course Area of Concentration 1</td>
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<td>Core Course Area of Concentration 1</td>
<td>3</td>
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<tr>
<td>Elective Course Area of Concentration 1</td>
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<td>Elective Course Area of Concentration 1</td>
<td>3</td>
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<tr>
<td>IENG 796</td>
<td>1-3 IENG 796</td>
<td>1-3 IENG 796</td>
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<td><strong>Total</strong></td>
<td>10-12</td>
<td><strong>Total</strong></td>
<td>10-12</td>
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Second Year  
<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Course Area of Concentration 2</td>
<td>3</td>
<td>IENG 697</td>
<td>9</td>
</tr>
</tbody>
</table>
Core Course Area of Concentration 3 3
IENG 697 3

Total credit hours: 38-42

**Major Learning Outcomes**

**INDUSTRIAL ENGINEERING**

1. Practice industrial engineering and to initiate and develop leadership roles in business, industry and/or government.
2. Continue professional development and life-long learning.
3. Interact in society and business in a professional and ethical manner.
4. Be proficient in written and oral communication and to utilize people-oriented skills in individual and team environments.
5. Apply the skills from industrial engineering to be proficient in his/her chosen field or further advanced studies.