Student Handbook
& Curriculum Requirements

Curriculum Effective
Fall 2017
A fall curriculum guide may be found at:
http://courses.engr.wisc.edu/courses.php?deptCode=ie
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Introduction to Industrial and Systems Engineering at UW-Madison

Important Contact Information

Department of Industrial and Systems Engineering (ISyE)

Jeff Linderoth
ISyE Department Chair
linderoth@wisc.edu, (608) 890-1931
3270A Mechanical Engineering Building

Full List of ISyE faculty
http://directory. engr. wisc. edu/ie/faculty

Student Services:

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1410 Engineering Drive, Rm. 170

*Please contact Maria, Alexis, or Francisca for any questions about your ISyE program and more!

Department Administration:

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3246 Mechanical Engineering Building

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3270 Mechanical Engineering Building

ISyE Prospective Students Please Contact
Engineering General Resources (EGR)
egradvisor@engr.wisc.edu
(608) 262-2473

College of Engineering

Jennifer Binzley
Assistant Dean, Undergraduate Affairs
binzley@wisc.edu, (608) 262-3484
2620 Engineering Hall

Important Web Addresses:

- My UW Homepage: https://my.wisc.edu/
- ISyE Department Home Page: https://www. engr. wisc. edu/department/industrial-systems-engineering/
- Schedule of Classes: http://registrar.wisc.edu/schedule_of_classes_students.htm
- ISyE Department Facebook Page: https://www. facebook. com/ISyE.UWMadison/?ref=aymt_homepage_panel
- ISyE Department Twitter Account: https://twitter.com/uwisye
- ISyE Alumni and Student LinkedIn Group: https://www.linkedin.com/groups/138818

Please see your MyUW student center course information for waitlist information.
Overview

Industrial engineers make things better!

The first bachelor’s degree in Industrial Engineering at the University of Wisconsin-Madison was awarded in 1969. Since that time, an increasing percentage of industry and other organizations have discovered the value of industrial and systems engineers. Today, there is a large demand for people with diversified backgrounds, who possess technical knowledge and people skills.

In the Department of Industrial and Systems Engineering at UW-Madison, the course curriculum is designed to give you this background while allowing you choices to match your interests. Courses focusing on team and design projects also help to prepare you for success in the workplace.

Through the ISyE required courses and electives you will be exposed to the following five main areas of interest:

- Decision Science and Operations Research
- Health Systems Engineering
- Human Factors and Ergonomics
- Manufacturing and Production Systems
- Quality Engineering and Management

More information about these areas can be found at https://www.engr.wisc.edu/department/industrial-systems-engineering/research-in-industrial-systems-and-engineering/.

After graduation, there are many different job opportunities available to industrial engineers

There is virtually no limit to what can be done using industrial and systems engineering! Many industrial engineers are employed in some facet of manufacturing, where they interface with many types of professionals and work to blend technology, people, money and information for smooth and efficient operations. Job opportunities outside manufacturing industries abound as well. Industrial engineers work in hospitals and medical centers, telecommunication companies, research laboratories, education systems, airline and transportation companies, banks, consulting organizations, and more. Many industrial engineers also go into management positions.

How do I choose my electives?

To help you, we’ve included lists of electives on pages 10 & 11!

Review the individual class descriptions and get an idea of what the work in each area would look like for you.

Still unsure?
Contact your assigned faculty or academic advisor for more information.

Academic Advisors:
Maria Zarzalejo Camejo, Alexis Steinbach, or Francisca Jofre in Student Services:
1410 Eng. Drive, Room 170
zarzalejocam@wisc.edu / (608) 263-7038
asteinbach@wisc.edu / (608) 265-8268
jofre@wisc.edu / (608) 260-0625
Department Educational Mission, Vision & Guiding Principles

Mission:
Create, acquire, assimilate, apply, and transfer knowledge for the design, analysis, improvement and implementation of complex systems that include humans, materials and equipment and other resources – the essence of Industrial and Systems Engineering.

Vision:
To be a top-ranked industrial and systems engineering department recognized for:
- Innovative educational curricula and learning experiences
- Strong, balanced research program
- Positive and diverse learning environment
- Beneficial outreach/technology transfer activities
- Leadership in the ISyE profession

Guiding Principles:
- Support and reward excellence and innovation
- Create competencies for life-long learning
- Foster environments for teamwork, diversity, and good university citizenship
- Create partnerships with industry, government, and alumni
- Act with professional and ethical responsibility
- Advance the reputation of the ISyE profession, the ISyE Department, and the University
ISyE Educational Objectives

Graduates will demonstrate competence in the professional practice of industrial engineering:

- Demonstrate a thorough understanding and working knowledge of mathematics, physical science, economics, and basic engineering principles to solve industrial engineering problems
- Independently use appropriate techniques, skills, and tools to identify, formulate, analyze, and solve industrial engineering problems
- Design a system, component, or process to meet an identified need

Graduates will demonstrate the skills needed to assume leadership in their workplaces and profession:

- State a lifelong learning plan and demonstrate research skills to gain new knowledge or information necessary
- Communicate and work effectively on professional teams to solve engineering problems
- Act with professional and ethical responsibility, and appreciate the impact of proposed solutions in a global/societal context
ISyE Educational Outcomes

A graduate from UW-Madison with a BS in Industrial & Systems Engineering (BSIE) can:

- Apply knowledge of math, science, economics, and engineering principles to solve ISYE, social or business problems
- Recognize, describe, predict and analyze systems behavior
- Apply experimental design or data analytics
- Demonstrate ability to design a system, component, or process to meet desired needs within realistic constraints, such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- Design effective and efficient human and technical work systems
- Contribute to solving ISyE problems and cooperate with engineers to solve engineering and societal problems
- Identify, formulate, and solve engineering problems using appropriate information and approaches
- Understand physiological, cognitive, and sociotechnical aspects of humans as components in complex systems
- Identify opportunities and apply engineering solutions for evaluating productivity and quality improvement
- Demonstrate an understanding of professional and ethical responsibility
- Demonstrate an understanding of the impact of engineering solutions in a global, economic, environmental, and societal context
- Demonstrate knowledge of contemporary issues across various industries
- Show proficiency and effectiveness in technical communications
- Engage in continued learning and demonstrate an appreciation of the benefits of lifelong learning
- Apply the techniques, skills, and modern engineering tools necessary for engineering practice, such as quality engineering, optimization, simulation, and project management
# ISyE Curriculum

## ISyE Required Curriculum (Fall 2016 and beyond)

### Math and Statistics

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 221 (or 217 or 275)</td>
<td>Calculus and Analytic Geometry</td>
<td>5</td>
</tr>
<tr>
<td>Math 222 (or 276)</td>
<td>Calculus and Analytic Geometry</td>
<td>4</td>
</tr>
<tr>
<td>Math 234</td>
<td>Calculus - Functions of Several Variables</td>
<td>4</td>
</tr>
<tr>
<td>Math 340</td>
<td>Elementary Matrix &amp; Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>Stat 311</td>
<td>Introduction to Mathematical Statistics I</td>
<td>3</td>
</tr>
<tr>
<td>Stat 312</td>
<td>Introduction to Mathematical Statistics II</td>
<td>3</td>
</tr>
</tbody>
</table>

### Science

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 201 (or EMA 201)</td>
<td>General Physics</td>
<td>5</td>
</tr>
<tr>
<td>Physics 202</td>
<td>General Physics</td>
<td>5</td>
</tr>
<tr>
<td>Chem 109 (or 103 &amp; 104)</td>
<td>General Chemistry</td>
<td>5-9</td>
</tr>
<tr>
<td>Comp Sci 301 or 200 or 300</td>
<td>Introduction to Programming</td>
<td>3</td>
</tr>
</tbody>
</table>

### Eng. & Science Electives

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng. Science (Non ISyE or EPD) (min 3cr), Computer Science Elective (min3cr), Statistics Elective (min3cr); Additional 6 credits of electives in Eng. Science, CS, Statistics, Math or Biology</td>
<td>15</td>
</tr>
</tbody>
</table>

### Required ISyE Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acct IS 300 (or 100)</td>
<td>Accounting Principles</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 313</td>
<td>Engineering Economic Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 315</td>
<td>Production Planning and Control</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 320</td>
<td>Simulation and Probabilistic Modeling</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 321</td>
<td>Simulation Modeling Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>ISyE 323</td>
<td>Operations Research-Deterministic Modeling</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 348</td>
<td>Human Factors Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>ISyE 349</td>
<td>Introduction to Human Factors</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 350</td>
<td>Junior Design Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 415</td>
<td>Introduction to Mfg. Systems, Design &amp; Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 417</td>
<td>Health Systems Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 450</td>
<td>Senior Design Project</td>
<td>3</td>
</tr>
</tbody>
</table>

### ISyE Technical Electives and Inter Egr 110

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Factors, Quantitative Methods, Quality course Requirement and Inter Egr 110*</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

**Inter Egr 110- Intro to Engineering (1 credit) According to CoE regulations**

### Communication Skills

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comm A + Comm B (EPD 397)</td>
<td>According to CoE regulations</td>
<td>6</td>
</tr>
<tr>
<td>Technical Communication</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

### Liberal Studies

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electives</td>
<td>According to COE Regulations for Liberal Studies Electives</td>
<td>11</td>
</tr>
<tr>
<td>Econ 101 (or 111)</td>
<td>Principles of Micro Economics</td>
<td>4</td>
</tr>
</tbody>
</table>

### Min Required Credits

<table>
<thead>
<tr>
<th>Total Credits</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>120</td>
</tr>
</tbody>
</table>

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1. EMA 201 alone does NOT meet the pre-req for Physics 202. If you take EMA 201 you must take either EMA 202 or ME 240 also to meet the Physics 202 prerequisites. EMA 202 and ME 240 will fulfill requirements for engineering and science electives.
2. CS 300 can be used as the Science-Computer Science requirement or as a CS elective, but it cannot be used to fulfill both requirements.
3. InterEgr 170 (or other eligible InterEgr departmental course option) will count toward the Eng & Science Elective credits.
4. This course is not required for transfer students. (Inter Egr 110 will count as 1 credit undesignated IE Tech Elective (undesignated) for ISyE students).

*For complete ISyE Department Program and ISyE Curriculum Guide Details please visit: [https://www.engr.wisc.edu/department/industrial-systems-engineering/](https://www.engr.wisc.edu/department/industrial-systems-engineering/)*

*ISyE Online Course Planning Assistance: [https://www.engr.wisc.edu/academics/student-services/academic-advising/first-year-undergraduate-students/](https://www.engr.wisc.edu/academics/student-services/academic-advising/first-year-undergraduate-students/)*
### Engineering and Science Electives

Fifteen credits in engineering and science are required, with at least three credits coming from engineering, computer science and statistics. Courses that can be used to fulfill the requirements are listed below:

<table>
<thead>
<tr>
<th>Engineering Science</th>
<th>(Example of popular electives)</th>
<th>Min 3 Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mat. Sci 350</td>
<td>Introduction to Materials Science</td>
<td>3</td>
</tr>
<tr>
<td>Mech. Engr 240</td>
<td>Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>Mech. Engr 418</td>
<td>Materials Science of Polymers for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>EP 271</td>
<td>Engineering Problem Solving I</td>
<td>3</td>
</tr>
<tr>
<td>Civ Engr 498</td>
<td>Construction Project Management</td>
<td>3</td>
</tr>
<tr>
<td>Civ Engr 579</td>
<td>Seminar- Transportation Engineering</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Computer</th>
<th>Min 3 Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comp Sci 270</td>
<td>Fundamentals of Human-Computer Interaction</td>
</tr>
<tr>
<td>Comp Sci 300</td>
<td>Programming II</td>
</tr>
<tr>
<td>Comp Sci 310</td>
<td>Problem Solving using Computers</td>
</tr>
<tr>
<td>Comp Sci 367</td>
<td>Introduction to Data Structures</td>
</tr>
<tr>
<td>Comp Sci 368</td>
<td>Learning a New Programming Language</td>
</tr>
<tr>
<td>Comp Sci 369</td>
<td>Web Programming</td>
</tr>
<tr>
<td>Comp Sci 412</td>
<td>Introduction to Numerical Methods</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Min 3 Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stat 327</td>
<td>Learning a Statistical Language-Introductory Data Analysis with R</td>
</tr>
<tr>
<td>Stat 333</td>
<td>Applied Regression Analysis</td>
</tr>
<tr>
<td>Stat 349</td>
<td>Introduction to Time Series</td>
</tr>
<tr>
<td>Stat 351</td>
<td>Introductory Nonparametric Statistics</td>
</tr>
<tr>
<td>ISYE 412</td>
<td>Fundamentals of Industrial Data Analytics</td>
</tr>
<tr>
<td>Stat 424</td>
<td>Statistical Experimental Design for Engineers</td>
</tr>
<tr>
<td>Stat 471</td>
<td>Introduction to Statistical Data Processing</td>
</tr>
<tr>
<td>ISyE 575</td>
<td>Introduction to Quality Engineering</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mathematics</th>
<th>Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 240</td>
<td>Introduction to Discrete Mathematics</td>
</tr>
<tr>
<td>Math 319</td>
<td>Techniques in Ordinary Differential Equations</td>
</tr>
<tr>
<td>Math 371</td>
<td>Basic Concepts of Mathematics</td>
</tr>
<tr>
<td>Math 431</td>
<td>Introduction to the Theory of Probability</td>
</tr>
<tr>
<td>Math 441</td>
<td>Introduction to Modern Algebra</td>
</tr>
<tr>
<td>Math 475</td>
<td>Introduction to Combinatorics</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biology</th>
<th>Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zoo 101</td>
<td>Animal Biology</td>
</tr>
<tr>
<td>Zoo 220</td>
<td>Biology and Society</td>
</tr>
<tr>
<td>Zoo 260</td>
<td>Introductory Ecology</td>
</tr>
<tr>
<td>Bio 151/153</td>
<td>Introductory Biology</td>
</tr>
<tr>
<td>Physio 335</td>
<td>Physiology</td>
</tr>
</tbody>
</table>

---

1. If you would like to submit a request for a course substitution, fill the following form and meet with your academic advisor to discuss further: [https://www.engr.wisc.edu/app/uploads/2016/02/Course-Substitution-Form-ISyE-Undergraduate.pdf](https://www.engr.wisc.edu/app/uploads/2016/02/Course-Substitution-Form-ISyE-Undergraduate.pdf)

2. **Engineering Science:** With only a few exceptions, any engineering course at the 200 level or above that is not listed as, or cross-listed with, ISyE or EPD. Courses that do not fulfill the requirement for Engineering & Science credit are classes that teach something other than engineering science principles (such as business or leadership).

3. **Computer Science:** Besides the listed courses, any computer science course at the 500 level or greater that is not cross-listed with ISyE will provide Computer Science credit.

4. **CS 300:** Can be used as the Science-Computer Science requirement or as a CS elective, but it cannot be used to fulfill both requirements.

5. **Statistics:** Besides the listed courses, most statistics courses at the 500 level or greater that are not cross-listed with ISyE will provide Statistics credit with department approval (Statistics 511 and 541 do not fulfill the requirement).

6. This course can be used as a Statistics elective or as an ISyE Technical Elective, but it cannot be used to fulfill both requirements.

7. Credit will not be given for both ISyE 575 and Statistics 424 to fulfill requirements for the ISyE undergrad program.

8. **Mathematics:** Besides the listed courses, any math course at the 500 level or greater that is not cross-listed with ISyE will provide Mathematics credit.

9. Mathematics and Biology electives are not required, but could be used to satisfy the additional 6 credits of Engineering & Science Electives.
**ISyE Technical Electives (12 credits required)**

<table>
<thead>
<tr>
<th>Human Factors Sociotechnical Methods</th>
<th>Min 3 Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISyE 515 Engineering Management</td>
<td>3</td>
</tr>
<tr>
<td>ISyE/Psych 549^</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 552 Hum Factors Eng Design &amp; Eval</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 555 Human Performance and Accident Causation</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 556^ Occupational Safety &amp; Health Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 559 Patient Safety &amp; Error Reduction</td>
<td>2</td>
</tr>
<tr>
<td>ISyE/BME 564 Occupational Ergonomics and Biomechanics</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 565 Ergonomics in Service</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 601^ Special Topics in Industrial Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 602^ Special Topics in Human Factors</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 610^ Design of Program Evaluation Systems</td>
<td>3</td>
</tr>
<tr>
<td>ISyE/LIS 617 Health Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 650^ Labor-Management Relations for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>ISyE/Psych 652 Sociotechnical Systems</td>
<td>3</td>
</tr>
<tr>
<td>ISyE/Psych 653 Organization and Job Design</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 658/OTM 758 Managing Technological Change in Mfg. Systems</td>
<td>3</td>
</tr>
<tr>
<td>ISyE/BME 662 Design &amp; Human Disability &amp; Aging</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 663^ Occupational Stress</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 699^ Advanced Independent Study (Focused on HF)</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quantitative Methods</th>
<th>Min 3 Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISYE 412^ Fundamentals of Industrial Data Analytics</td>
<td>3</td>
</tr>
<tr>
<td>Stat 424^ Statistical Experimental Design</td>
<td>3</td>
</tr>
<tr>
<td>ISyE/CS/Math 425^ Introduction to Combinatorial Optimization</td>
<td>3</td>
</tr>
<tr>
<td>ISyE/NE 460 Uncertainty Analysis for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>ISyE/ME 510 Facilities Planning</td>
<td>3</td>
</tr>
<tr>
<td>ISyE/ME 512 Inspection, Quality Control and Reliability</td>
<td>3</td>
</tr>
<tr>
<td>ISyE/ME 513 Analysis of Capital Investments</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 516 Introduction to Decision Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 517 Decision Making in Health Care</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 520 Quality Assurance Systems</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 524 Introduction to Optimization</td>
<td>3</td>
</tr>
<tr>
<td>ISyE/CS/Math/Stat 525 Linear Programming Methods</td>
<td>3</td>
</tr>
<tr>
<td>ISyE/CS/AAE 526 Advanced Linear Programming</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 575^2,3 Introduction to Quality Engineering (online)</td>
<td>3</td>
</tr>
<tr>
<td>ISyE/OTM 578^ Facilities Location Models</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 601^ Special Topics in Industrial Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 605 Computer-Integrated Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 612 Information Sensing Analysis for Mfg Processes</td>
<td>3</td>
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<tr>
<td>ISyE 615 Production Systems Control</td>
<td>3</td>
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<tr>
<td>ISyE/OTM 620 Simulation Modeling and Analysis</td>
<td>3</td>
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<tr>
<td>ISyE 624 Stochastic Modeling Techniques</td>
<td>3</td>
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<tr>
<td>ISyE/Math/OTM/Stat 632 Introduction to Stochastic Modeling</td>
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<tr>
<td>ISyE/Math/OTM 633^ Queuing Theory and Stochastic Processes</td>
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<td>ISyE/CS 635^ Tools and Environments for Optimization</td>
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<tr>
<td>ISyE/ME 641 Design &amp; Analysis of Manufacturing Systems</td>
<td>3</td>
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<tr>
<td>ISyE/ME 643 Performance Analysis of Manufacturing Systems</td>
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<tr>
<td>ISyE 645 Engineering Supply Chains</td>
<td>3</td>
</tr>
<tr>
<td>ISyE/OTM 671 E-Business: Technologies, Strategies, and Applications</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 699^ Advanced Independent Study (Focused on QM)</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 722/ Info Syst 422 Computer-Based Data Management</td>
<td>3</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Quality Engineering</th>
<th>Min 3 Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stat 424^ Statistical Experimental Design for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>ISyE/ME 512 Inspection, Quality Control and Reliability</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 515 Engineering Management</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 575^2,3 Introduction to Quality Engineering (online)</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 601^ Special Topics in Industrial Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 699^ Advanced Independent Study (Focused on Quality Eng.)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Note:** Courses marked with the ^ symbol are rarely offered by the department.

1. Any Special Topics course (601) or Ind Study (699) MUST have prior approval to be used as a technical elective. No more than three credits may be taken in ISyE 699 in fulfillment of the requirement for ISyE technical electives.
2. Credit will not be given for both ISyE 575 and Statistics 424.
3. This course can be used as a Statistics elective or as an ISyE Technical Elective, but it cannot be used to fulfill both requirements.
ISyE Design Requirements

Engineering design is the process of devising a system, component, or process to meet desired needs. It is a decision-making process (often iterative), in which the basic sciences, mathematics and engineering sciences are applied to convert resources optimally to meet a stated objective. Among the fundamental elements of the design process are the establishment of objectives and criteria, synthesis, analysis, and construction, testing, and evaluation.

ISyE 315 · Production Planning & Control · 3 credits

Techniques and applications of control concepts in the design of inventory, production, quality, and project-planning systems; use of the computer as a component in such systems

ISyE 350 · Junior Design Lab · 3 credits

The Junior design level lab will include open-ended problem solving projects or major homework assignments that:
- Develop the student’s creativity and problem solving skills
- Require the formulation of design problem statements, and defined objectives and criteria for system synthesis, analysis, and evaluation
- Develop and use the student’s concept of modern design theory and methodology
- Require the consideration and feasibility of alternative solutions
- Address realistic factors related to economics, safety, aesthetics, ethics, and societal impact
- Integrate and build upon basic sciences and knowledge presented in preceding classes
- Develop teamwork and communication skills
- Focus on designing “processes” to promote the understanding, acceptance, and testing of the solution

ISyE 450 · Senior Design Project · 3 credits

This required senior-level capstone course provides students with a team-based project experience to address a real-world design challenge posed by an external organization. Student-teams work in close collaboration with the project client to design a new system or process, or redesign an existing one, by integrating and applying appropriate ISyE knowledge, methodologies and tools for problem definition and analysis; idea generation; solution development; evaluation and justification; implementation planning; and impact assessment.
Liberal Studies Requirements

All ISyE students must fulfill the following College of Engineering’s liberal studies requirements:

1. As a graduation requirement, and to fulfill campus general education guidelines, all engineering undergraduate students must take 15 credits from the College of Engineering, the Institute of Environmental Studies, or the College of Letters and Science, that carry H, S, L, or Z timetable breadth designators.

2. Additionally, these credits must fulfill the following sub-requirements:
   - **Depth Condition:** A minimum of two courses from the same department or program. At least one of these two courses must be above the elementary level, and shown in the course guide to have an I, A, or D level designator.
     - Foreign language retro credits fulfill this sub-requirement. Economics 111 (or 101) combined with any economics course at the I or A levels may be used to satisfy this requirement. Other combinations of courses may also be used.
   - A minimum of six credits designated as humanities (H, L or Z breadth designator in the timetable), and an additional minimum of three other credits designated as social studies (S or Z).
     - Foreign language courses count as H credit. However, retro credits do not count toward this sub-requirement.
   - At least three credits in courses designated as Ethnic Studies (small case “e” course guide designator).
     - These credits may help satisfy regulations 1 or 2 as well, but they only count once toward the total 15 credits required.

Notes:

1. **Course Guide Designators:** I—Intermediate; A—Advanced; D—Intermediate or Advanced.
2. **Retro credits:** awarded by foreign language departments for successful completion of a 200 level or above foreign language course without taking a 100 level course. They can fulfill the depth condition sub-requirements, but they do not count toward the total 15 credits requirement.
Substitution Procedure
Any time you want to deviate from the published elective lists (pgs. 10-11), you must fill out a course substitution form, available on our website: https://www.engr.wisc.edu/app/uploads/2016/02/Course-Substitution-Form-ISyE-Undergraduate.pdf

Form instructions:
- Fill out the substitution request form
- Meet with your academic advisor to submit the form

Course substitutions will be reviewed by the department and you will be notified online of the outcome of the request. Course substitution requests must be submitted BEFORE you register for the course.

Pass-Fail Option Information
Pass-Fail (P-F) is an alternative way of being graded in a regularly graded course not counting toward your degree program (a free elective). A student may change the grading option of a full-semester course to or from pass-fail only during the first four weeks of classes. These courses do not fulfill degree requirements. Only students in good standing and who have accumulated at least 12 credits toward the degree before taking a course may elect the P-F privilege. Pass-fail grades are not included in GPAs.

The pass-fail agreement is between the student and the Registrar, and is not revealed to the person teaching the course. The person teaching the course submits the appropriate letter grade to the Registrar, who converts C or higher grades to S (Satisfactory), and D or F grades to U (Unsatisfactory).

Enrollment Demo:
http://registrar.wisc.edu/isis_helpdocs/enrollment_demos/V90CourseChangeRequest/V90CourseChangeRequest.htm
Example: ISyE Curriculum 2015 with Physics 201

**Total credits to graduate: 120-121**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course</strong></td>
<td><strong>Credits</strong></td>
</tr>
<tr>
<td>Math 221 (or 217 or 275)</td>
<td>5</td>
</tr>
<tr>
<td>Chem 109</td>
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<tr>
<td>InterEngr 110</td>
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**Sophomore Year**

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<tr>
<td><strong>Course</strong></td>
<td><strong>Credits</strong></td>
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<tr>
<td>Math 234</td>
<td>3</td>
</tr>
<tr>
<td>Physics 202</td>
<td>5</td>
</tr>
<tr>
<td>Stat 311</td>
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</tr>
<tr>
<td>Comp Sci 301 or 200</td>
<td>3</td>
</tr>
<tr>
<td>Eng. &amp; Science Elective (Open)</td>
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<td><strong>Total</strong></td>
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**Junior Year**

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<tr>
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<th>Second Semester</th>
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</thead>
<tbody>
<tr>
<td><strong>Course</strong></td>
<td><strong>Credits</strong></td>
</tr>
<tr>
<td>ISyE 323</td>
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</tr>
<tr>
<td>ISyE 348 &amp; ISyE 349</td>
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<tr>
<td>Acct IS 100/300</td>
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<tr>
<td>Eng. &amp; Science Elective (Stats.)</td>
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<tr>
<td>Liberal Studies Elective</td>
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<td>Liberal Studies Elective</td>
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<td><strong>Total</strong></td>
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**Senior Year**

<table>
<thead>
<tr>
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<th>Second Semester</th>
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</thead>
<tbody>
<tr>
<td><strong>Course</strong></td>
<td><strong>Credits</strong></td>
</tr>
<tr>
<td>ISyE 417</td>
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</tr>
<tr>
<td>ISyE Technical Elective (HF)</td>
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<tr>
<td>ISyE Technical Elective (Quant. M)</td>
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<tr>
<td>Liberal Studies Elective</td>
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<tr>
<td>Eng. &amp; Science Elective (Open)</td>
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<tr>
<td><strong>Total</strong></td>
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</table>
Example: ISyE Curriculum 2015 with EMA 201

**Total credits to graduate: 121-122**

### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
<th>Second Semester</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Math 221 (or 217 or 275)</td>
<td>5</td>
<td>Math 222 (or 276)</td>
<td>5</td>
</tr>
<tr>
<td>Chem 109</td>
<td>5</td>
<td>EMA 201</td>
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<tr>
<td>InterEngr 110</td>
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<td>Econ 111 (or 101)</td>
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<tr>
<td>Gen Ed Comm. A Elective</td>
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<td>Liberal Studies Elective</td>
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<tr>
<td><strong>Total</strong></td>
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### Sophomore Year

<table>
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<tr>
<th>First Semester</th>
<th>Credits</th>
<th>Second Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 234</td>
<td>3</td>
<td>Stat 312</td>
<td>3</td>
</tr>
<tr>
<td>EMA 202 or ME 240</td>
<td>3</td>
<td>ISyE 313</td>
<td>3</td>
</tr>
<tr>
<td>Stat 311</td>
<td>3</td>
<td>ISyE 315</td>
<td>3</td>
</tr>
<tr>
<td>Comp Sci 301 or 200</td>
<td>3</td>
<td>Physics 202</td>
<td>5</td>
</tr>
<tr>
<td>Liberal Studies Elective</td>
<td>3</td>
<td>Eng. &amp; Science Elective (Open)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td></td>
<td><strong>17</strong></td>
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</table>

### Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
<th>Second Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISyE 323</td>
<td>3</td>
<td>ISyE 320</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 348 &amp; ISyE 349</td>
<td>4</td>
<td>ISyE 321</td>
<td>1</td>
</tr>
<tr>
<td>Acct IS 100/300</td>
<td>3</td>
<td>ISyE 350 Jr Design Lab</td>
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<tr>
<td>Math 340</td>
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<td>EPD 397</td>
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<td>Eng. &amp; Science Elective (CS)</td>
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<td>ISyE Tech Elect (Open)</td>
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<td><strong>Total</strong></td>
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### Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
<th>Second Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISyE 415</td>
<td>3</td>
<td>ISyE 450 Senior Design Project</td>
<td>3</td>
</tr>
<tr>
<td>ISyE Technical Elective (HF)</td>
<td>3</td>
<td>ISyE Technical Elective (Quant. M)</td>
<td>3</td>
</tr>
<tr>
<td>ISyE 417</td>
<td>3</td>
<td>ISyE Technical Elective (Quality)</td>
<td>3</td>
</tr>
<tr>
<td>Liberal Studies Elective</td>
<td>3</td>
<td>Eng. &amp; Science Elective (Eng.)</td>
<td>3</td>
</tr>
<tr>
<td>Eng. &amp; Science Elective (Open)</td>
<td>3</td>
<td>Eng. &amp; Science Elective (Stats)</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td></td>
<td><strong>15</strong></td>
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</table>
Advising
The College of Engineering (COE) encourages students to seek guidance from multiple sources, including both faculty and academic advisors, because they will receive richer and more valuable advice.

Role of the Student in the Advising Process
The COE requires, and expects, students to be active in educational planning and advisement.

Student Expectations:
- Know what your degree requirements are
- Monitor your academic progress, which includes knowing what courses have been completed, what courses remain, and what “good academic standing” means
- Be aware of the policies and procedures that guide your studies
- Consult regularly with an advisor, especially before every registration period
- Be aware of how you learn in order to balance course schedules

Advising Day
The ISyE department will hold two ISyE advising days to assist with this process—one during the fall and one during the spring. Students should plan on attending. If you are studying abroad, in a co-op, or otherwise unable to attend advising day, you must check in with your faculty or academic advisor prior to enrollment time.

Faculty vs. Academic Advisors
All undergraduate students who have been admitted into the ISyE department will be assigned both a faculty advisor and an academic advisor to assist them throughout their ISyE program.

Faculty Advisors
Each student is strongly encouraged to take the initiative to build a relationship with his or her faculty advisor and other faculty members. Building a mentoring relationship with faculty is best done by meeting in person with faculty for scholarly advice, such as guidance on research/independent study projects or advice on post-graduation plans.

Faculty advisors are best to see for:
- Questions about course content or intensity
- Help selecting advanced elective coursework to align with your post-graduation plans

Academic Advisors
The academic advisor advises students on curriculum requirements, COE and UW-Madison policies and procedures, and graduate school or professional school application processes. You can meet with an IE academic advisor by drop-in appointments at the Undergraduate Student Services Center in 1410 Engineering Drive Suite 170. You can also make an appointment directly with Alexis Steinbach, Maria Zarzalejo Camejo, or Francisca Jofre by using the online scheduling tool (https://calendar.wisc.edu/scheduling-assistant/) or by calling (608) 262-3471.

Academic advisors are the best resource for:
- Developing individual educational plans
- Answering questions about reports from the Degree Audit Reporting System (DARS)
- Connecting students with other campus resources (e.g., Office of Student Financial Services, Engineering Transfer Admissions, International Engineering Studies and Programs, Engineering Career Services, etc.)
Grievance Procedures

If a student feels unfairly treated or aggrieved by faculty, staff, or another student, the University offers several avenues to resolve the grievance. Student’s concerns about unfair treatment are best handled directly with the person responsible for the objectionable action. If the student is uncomfortable making direct contact with the individual(s) involved, they should contact the advisor or the person in charge of the unit where the action occurred (program or department chair, section chair, lab manager, etc. Many departments and schools/colleges have established specific procedures for handling such situations; check their web pages and published handbooks for information. If such procedures exist at the local level, these should be investigated first. For more information, see the College of Engineering Policies and Procedures:
https://www.engr.wisc.edu/academics/student-services/academic-advising/policies-and-procedures/

And the Graduate School Academic Policies & Procedures: Grievances & Appeals:
https://grad.wisc.edu/acadpolicy/#grievancesandappeals

Procedures for proper accounting of student grievances against ISyE faculty, staff, or students:

1. The student is encouraged to speak first with the person toward whom the grievance is directed to see if a situation can be resolved at this level.
2. Should a satisfactory resolution not be achieved, the student should contact the program’s Grievance Advisor, ISyE’s Associate Chair of Graduate Affairs, to discuss the grievance. The Grievance Advisor will facilitate problem resolution through informal channels and facilitate any complaints or issues of students. The first attempt is to help students informally address the grievance prior to any formal complaint. Students are also encouraged to talk with their faculty advisors regarding concerns or difficulties, if necessary. University resources for sexual harassment, discrimination, disability accommodations, and other related concerns can be found on the UW Office of Equity and Diversity website: https://oed.wisc.edu/.
3. Other campus resources include:
   a. The Graduate School
   b. McBurney Disability Resource Center
   c. Employee Assistance Office
   d. Ombuds Office
   e. University Health Services
4. If the issue is not resolved to the student’s satisfaction, the student can submit the grievance to the Grievance Advisor in writing, within 60 calendar days of the alleged unfair treatment.
5. On receipt of a written complain, a faculty committee will obtain a written response from the person filing the grievance.
6. The faculty committee will determine a decision regarding the grievance. The Grievance Advisor will report on the action taken by the committee in writing to both the student and the party toward whom the complaint was directed within 15 working days from the date the complaint was received.
7. At this point, if either party (the student or the person toward whom the grievance is directed) is unsatisfied with the decision of the faculty committee, the party may file a written appeal. Either party has 10 working days to file a written appeal to the School/College.
8. Documentation of the grievance will be stored for at least 7 years. Significant grievances that set a precedent will be stored indefinitely.
Policy on Sexual Harassment

Sexual harassment is a community concern. When sexual harassment occurs, it degrades the quality of work and education at the University of Wisconsin-Madison. It erodes the dignity and productivity of the individuals involved and diminishes the quality, effectiveness, and stature of the institution. It can occur in any university setting (an office, a classroom, a university program). Each of us has a collective responsibility not to harass others and to act responsibly when confronted by the issue of sexual harassment, thereby promoting an environment that better supports excellence in teaching, research, and service.

(Taken from: http://www.oed.wisc.edu/sexualharassment/index.html)

What is Sexual Harassment?
Unwelcome sexual advances, requests for sexual favors, and verbal or physical conduct of a sexual nature constitute sexual harassment when submission to such conduct is a condition of employment, academic progress, or participation in a university program; or submission to or rejection of such conduct influences employment, academic or university program decisions; or the conduct interferes with an employee’s work or a student’s academic career, or creates an intimidating, hostile, or offensive working, learning, or program environment.

Key Points about Sexual Harassment
- Differences in power or status can be a significant component in sexual harassment. A person who seems to acquiesce to sexual conduct may still experience tangible action harassment or hostile environment harassment if the conduct is unwelcome.
- Harassment can occur between men and women or between members of the same gender.
- Sexual harassment may or may not involve a tangible injury (e.g., economic loss, lowered grades). A sexually harassing environment, in and of itself, may constitute a harm.
- Individuals in positions of authority are responsible for ensuring that employees, students or others do not harass. In an academic or program setting, offenders can be faculty, instructors, lecturers, teaching assistants, coaches, tutors, or fellow students or program participants.
- The person filing a sexual harassment charge does not have to be the person harassed but could be anyone significantly harmed by the harassing conduct.
- Some behavior that is not in violation of university policy may, nonetheless, be unprofessional under the circumstances. Consequences of such unprofessional behavior may include poor performance evaluations or possible discipline.

What to do if you feel you’ve been sexually harassed:
- Seek advice. Consult your department chair, another divisional resource person, the Office of Equity and Diversity (http://www.oed.wisc.edu/), or another campus resource to discuss options for resolution.
- You may choose to seek informal resolution or file a sexual harassment complaint. You may find more information on filing a complaint at http://www.oed.wisc.edu/dishar.html
- For additional information, please visit: http://www.oed.wisc.edu/sexualharassment/do.html

For more information on discrimination against students and other resources:
- Cases of suspected child abuse and/or neglect: http://oed.wisc.edu/documents/UW-Madison_Policy_on_Child_Abuse_and_Neglect.pdf
Other Important Academic Resources

Degree Audit Reporting System (DARS)

The Degree Audit Reporting System (DARS) is part of UW–Madison’s commitment to academic advising for undergraduate students. The DARS report provides an automated summary of a student's academic progress toward a degree by showing which requirements have already been completed, and which remain unsatisfied. The report is particularly helpful when combined with the knowledge and insight of an advisor. DARS is not intended to replace students’ contact with academic and faculty advisors. Instead, the quick and thorough analysis provided by DARS allows more time in an advising appointment to discuss course options, research opportunities, plans for graduate school, or issues of personal interest or concern to students. DARS reports should always be reviewed with a student’s transcripts. Learn more about DARS by reading the Quick Guide for Students at "https://registrar.wisc.edu/documents/DARS_Students_Quick_Guide.pdf".

You can order a DARS report at my.wisc.edu on the Student Records tab.

Note: Please remember that DARS is just a computer program, and it may occasionally make mistakes or produce a report that is difficult to read. If you see something on your DARS report that does not seem right or that you don’t understand, please contact an advisor for further assistance.

UW Course Guide

The course guide provides a broad spectrum of course information in a consistent format and single location. It is an enriched, searchable course catalog with aggregated information from many campus sources. The course guide is available for use by current students, faculty, advisors, and staff. It is also available to the public at large.

Accessing the course guide: Anyone with an active UW-Madison NetID can login at http://my.wisc.edu/ and click on the Course Guide tab to access the guide. Prospective students, parents, high-school counselors or anyone without a UW-Madison NetID should access the course guide at http://public.my.wisc.edu/.

The course guide also provides you with a “Degree Planner” tab to organize and visualize your future semester.

Scholarships

In recent years, the Department has been able to award 15-25 scholarships per year to ISyE students. Scholarships are awarded during the fall semester, but are applied to the following academic year. Scholarships range from $1,000-$5,000 and are awarded to students with excellent academic records. Any ISyE student with a strong academic record is encouraged to apply. Applications are accepted until May 1st.

Scholarship applications can be found at http://scholarships.wisc.edu/Scholarships.
Tutoring & Academic Assistance

CoE Undergraduate Learning Center
https://www.engr.wisc.edu.academics/student-services/ulc/

The CoE undergraduate learning center is a good resource for many classes:

- **Drop-in tutoring**
- **Practice Engineering Problem Solving (PrEPS):** academic support for EMA 201, EMA 202, ME 240, Physics 201, and Physics 202
- **Group tutoring/study table**
- **Tutoring-by-request** (authorized students)

Contact Information: Rm 405 Wendt Commons, ulc@engr.wisc.edu

Other Resources and Learning Centers

- **Business Learning Center:** Economics, accounting, finance
- **Center for Educational Opportunity:** Academic and ancillary support services first-generation college students, students from economically vulnerable families, and students with disabilities.
- **Chemistry Learning Center:** Chemistry 103, 104, 343, 345
- **Diversity Affairs Office:** Guidance and support for underrepresented students and women in Engineering.
- **GUTS - Greater University Tutoring Service:** Math, science, languages, computer science, economics, statistics, etc.
- **Math Lab:** Math 101, 112, 113, 114, 141, 171, 211, 213, 221, 222, 234, 240
- **Math Tutorial:** Math 95, 101, 112, 113, 114, 171/217, 211, 213, 221, 222, 234
- **Physics Learning Center:** Physics 103, 104, 207, 208
- **Residence Hall Tutoring:** Popular classes such as Spanish, economics, math, and chemistry
- **Statistics Department Tutoring:** Stats 224, 301, 324, 371
- **Writing Center:** For UW-Madison courses with a writing component; the Writing Center does NOT provide support for Communications-A, English as a Second Language, or creative writing courses.
- **McBurney Disability Resource Center:** Academic accommodations for students with a documented disability, or possible undiagnosed disability. Students must provide documentation and be registered with the Center to receive a Verified Individualized Services & Accommodations (VISA) before they can obtain accommodations.
- **University Health Services:** Promoting, protecting, and restoring student health and well-being
International Student Services (ISS)

To maintain F-1 and J-1 visa status, international students must be enrolled in a full course of study each fall and spring semester.

For undergraduate students, a full course of study is 12 enrolled credits per semester. Summer enrollment is not required by the US federal government for F-1 and J-1 visa holders unless you are a new student (with a summer reporting date on your I-20 for initial school attendance).

There are valid academic and medical reasons for an international student to reduce his/her credit load. For any semester an international student intends to reduce his/her course load, he/she must:

1. Complete the Reduced Course Load for F-1 and J-1 Students form. The form is available at https://apps.iss.wisc.edu/upload/documents/rcl.pdf
2. Have his/her academic advisor or medical professional sign the form, and submit the form to the International Student Services (ISS) for review.

Check with an advisor in the ISS office if you want to confirm that you are in compliance with your visa regulations.
CoE Transfer Services

All students interested in transferring to Industrial & Systems Engineering, should visit http://studentservices engr.wisc.edu/advising/internal_transfer.html.

Please note that students enrolled in other engineering majors at UW-Madison can submit an application to transfer into ISyE through the CoE link above at the end of each academic term. Inter-departmental transfers are competitive and not guaranteed, if you are considering transferring majors, contact your academic advisor to discuss further.

For additional questions, contact: coeadvising@wisc.edu
ENHANCING YOUR EDUCATIONAL & PROFESSIONAL EXPERIENCE

Wendt Commons
A “one-stop-shopping” approach to teaching and learning services

Wendt Commons is comprised of:
- Wendt Library
- Engineering Media Services
- Engineering Learning Center

From renting out media equipment to setting up and maintaining online course components, this consolidation of resources can help in multiple ways.

Wendt Commons is also home to a constantly expanding technology-based community including the new makerspace. Students benefit by being able to access computer labs, cameras and video equipment, 3D printers, course videos, and virtually hardware, all software and tools needed for classes.

More information at [http://wendt.engr.wisc.edu/](http://wendt.engr.wisc.edu/)
Certificate Programs in the College of Engineering

While UW-Madison does not have minors, it does offer organized programs in specific disciplines that lead to a certificate and in most cases, a transcript notation indicating successful completion.

Six Sigma Green Belt Certification Program (No Transcript Notation)

Developed by Motorola in the early 1980s, Six Sigma is a disciplined approach to improve process quality and bottom-line results using common statistical tools. Six Sigma is a target-measurement system for near-perfect execution of a process, using reduction of variations and robust design as methods for improvement. The goals of defect reduction, yield improvement, improved customer satisfaction, lower costs, and thus higher net income are attained by the effective use of these statistical and problem-solving tools.

The Six Sigma Green Belt certificate complements the Industrial and Systems Engineering undergraduate degree by providing evidence of competence in this highly employable discipline, analyzing and solving quality problems and executing quality-improvement projects.

The Six Sigma Green Belt certificate will be issued to students who:
1. Complete a required 12-credit core of courses that emphasize the Six Sigma body of knowledge: ISyE 315; ISyE 512 or 612; ISyE 450 (or 515); and ISyE 575 – note ISyE 515 cannot be used to fulfill the Sr Design Requirement for Students – only ISyE 450 does.
2. Complete an industry project in ISyE 450 (or ISyE 515) following the Six Sigma design/measure/analyze/improve/control problem-solving methodology with instructor approval.
3. Apply for the certificate.

For more information: https://www.engr.wisc.edu/department/industrial-systems-engineering/academics/certificates/six-sigma-green-belt-certificate/
Faculty contact: Professor Jeff Linderoth, linderoth@wisc.edu, (608) 890-1931

Students please be advised that the required courses for certificate completion may be not offered every semester.

Please note: The ISyE Six Sigma Green Belt Certificate is an optional certificate that does not require students to take extra classes outside of the IE undergraduate program. Due to the popularity and high-demand of students seeking to complete the Six Sigma Green Belt Certificate, the department may not be able to accommodate all students that are interested in the required coursework.

Other Engineering Certificates

In addition to our engineering majors, you also can choose from a broad range of certificate programs that are designed to enhance your education, expand your skillset, and make you a more versatile, marketable engineer. Students need to be in good standing with the College of Engineering to apply for a certificate program. Certificates need to be completed concurrently with your engineering major.

- Biology in Engineering Certificate
- Certificate in Engineering for Energy Sustainability
- Certificate in Engineering Thermal Energy Systems
- Certificate in Integrated Studies in Science, Engineering and Society
- Certificate in International Engineering
- Certificate in Manufacturing Engineering
- Certificate in Nuclear Engineering Materials
- Certificate in Technical Communications
- Certificate in Technical Japanese Studies
Engineering Cooperative Education and Summer Intern Program

Students gain valuable "real world" engineering experiences working with a variety of industries and governmental agencies through the dynamic cooperative-education and summer-intern programs. *Any credits gained will be recorded as ISyE Technical Electives undesignated area. Students can apply up to 2 credits of ISyE 001 co-op or internship credits toward their ISyE degree program.

Cooperative Education

Obtaining work experience prior to completing your degree requirements typically increases employment opportunities and starting salaries at graduation. Most UW engineering co-ops work full-time in an engineering position from Jan. - Aug. or May - Dec. The co-op typically provides a solid eight months of paid engineering work experience. Alternating assignments are also an option.

Cooperative education is an academic option as part of your engineering education. Students who participate complete assignments and receive academic credit toward graduation. While on co-ops, students are considered full-time students and are eligible to maintain family or UW health insurance. Compensation is competitive, averaging $20/hr.

The advantage of a co-op over an internship is the increased level of responsibility received due to the longer duration of the work term. Co-ops are able to work on larger and more complex projects that require more time to complete.

Summer Internships

The summer internship is for students seeking engineering employment during the summer months. These 12-14 week assignments provide students exposure to engineering while enabling the employer to fill short-term project needs.

For more information: https://ecs.engr.wisc.edu/public/student/coopintern.php
Contact Person: Stephanie Salazar Kann, (608) 262-5096, ssalazar@wisc.edu
Engineering Study Abroad

Studying abroad offers valuable cross-cultural experiences and the opportunity to improve your language skills, live and work in culturally diverse surroundings, and improve your value on the job market.

Planning for your study-abroad experience is of utmost importance. You must meet with your academic and/or faculty advisor as well as with the coordinator of the study-abroad experience. Students are ultimately responsible for understanding how courses taken abroad will or will not fulfill degree requirements.

Come to your meeting prepared to discuss the following topics with your advisor:

- Courses you plan to take to ensure an academically successful experience
- Advisor approval/clearance forms
- Departmental course equivalencies
- DARS designations for courses that fulfill elective credits
- Grading of courses taken abroad
- Completing the last 30 credits abroad (if applicable)

Contact Information:
International Engineering Studies & Programs
1415 Engineering Drive, 1150 Engineering Hall
Tel: (608) 263-2191 international@engr.wisc.edu

International Engineering Studies & Programs (IESP)

International Engineering Studies and Programs within the College of Engineering prepares UW-Madison engineering students to study abroad. As an IESP participant, you can choose from more than 50 study-abroad programs in the Americas, Asia and the Pacific, and Europe. Most programs are available for a semester or year, and many offer instruction in English.

While abroad on an IESP program, you will maintain student status and you will earn pass-fail grades for coursework completed overseas.

The CoE does not consider study-abroad programs to be semesters in residence; therefore, you will need to request a waiver of the college’s residency requirements (at the time of application) if you plan to study abroad during your final 30 credits. The majority of programs are exchanges, which means that you would pay the same tuition as you currently do at UW-Madison. Financial aid is available to all UW degree-seeking students on study-abroad programs – even those who have not received aid in the past.

A minimum GPA of 3.0 (for most programs) is required to apply. Application deadlines are October 1 for the spring semester and March 1 for the fall semester or for the entire academic year.

More information: http://international.engr.wisc.edu/

International Engineering Certificate

To obtain a certificate in International Engineering, students must have a five-week (minimum) study abroad experience.

Additional information and access to the application can be found at https://www engr.wisc.edu/academics/undergraduate-academics/certificate-in-international-engineering/.
International Academic Programs (IAP)

*International Academic Programs* offers more than 150 study-abroad programs to UW-Madison students across campus. Instruction is in a wide range of languages, including many options in English. Most programs are limited to course options in social sciences and humanities, though a limited number of programs do have engineering courses available.

While abroad on an IAP program, you will maintain your student status, and are typically assigned a letter grade for the courses that you will take. If you have questions about the grading basis for a particular course, you will need to talk to both IAP and to your advisor.

The College of Engineering does not consider study-abroad programs to be semesters in residence; therefore, you will need to request a waiver of the college’s residency requirements (at the time of application) if you plan to study abroad during your final 30 credits.

**Contact information:**

International Academic Programs  
106 Red Gym  
716 Langdon Street  
Tel: (608) 265-6329  
peeradvisor@studyabroad.wisc.edu

**Other UW-Madison Study Abroad Experiences**

If a UW-Madison engineering student chooses to study abroad through another unit (or independently), it is extremely important that the student meet with the following people before going abroad:

- academic and/or faculty advisor
- coordinator of the study-abroad program
We highly recommend students become involved in extra-curricular organizations. These experiences provide you with a wide network of people and resources and they increase your understanding of the field by helping forge interactions with professors, professionals and peers.
Engineering Career Services (ECS)

Engineering Career Services (ECS) works with companies from around the country to help our engineering students at all degree levels, as well as our College of Engineering alumni, with career development. [https://www.engr.wisc.edu/academics/student-services/career-services/](https://www.engr.wisc.edu/academics/student-services/career-services/)

ECS helps students one-on-one by:
- preparing them for internship/co-op experiences
- assisting with job searches
- helping with resume & cover letter writing
- practicing interviewing skills (mock interviews, sample interview questions)
- providing other important career information such as negotiating job offers and salaries

Students can become lifetime members of Engineering Career Services by registering and paying a one-time $20 fee.
ISyE Graduate Programs (MS&PhD)

The Department of Industrial and Systems Engineering at UW-Madison offers opportunities for graduate study leading to the Master of Science Degree (Course Only Degree Options and MS Thesis/Research Degree Option) and the Doctor of Philosophy degrees in Industrial Engineering. Students entering the MS Degree program with a BS in Industrial Engineering from UW-Madison have automatically satisfied all the prerequisites. Discuss your interest and obtain more information about each program from your ISyE Academic or Faculty advisor.

Master of Science in Industrial Engineering — Course Only Option (1 Year)

30 credit Program Options – Students with a bachelor’s degree in Industrial Engineering are allowed to count up to 6 credits of approved undergraduate course work toward degree requirements allowing students to complete the MS degree course options in two full semesters (12 credits per semester). Please note: The summer session does not count as a full semester for these programs. GRE exam is not required and a minimum GPA of 3.0 is required.

MS – Human Factors Health Systems Engineering (HFHSE)
This option allows a student to obtain a Master of Science degree in just one academic year after their bachelor’s degree. Human Factors and Health Systems Engineering professionals can create productive, safe and satisfying environments for humans, and apply industrial and systems engineering tools and approaches to specific health care problems by examining, designing, testing and evaluating products, environments and how people interact in it. This Course-Only Option is intended for students who do not plan to pursue a PhD degree. Those students interested in obtaining a PhD should consider the Master of Science in Industrial Engineering 2-year program (Thesis/Research Option).

MS – Systems Engineering and Analytics (SEA)
This option allows a student to obtain a Master of Science degree in just one academic year after their bachelor’s degree. The program in Systems Engineering and Analytics will train students to recognize, identify, analyze, and solve decision problems arising in the efficient operations of engineering systems. The program focuses on methods and models for data analytics and data-driven decision-making. This Course-Only Option is intended for students who do not plan to pursue a PhD degree. Those students interested in obtaining a PhD should consider the Master of Science in Industrial Engineering 2-year program (Thesis/Research Option).

Master of Science in Industrial Engineering – Thesis/Research Option (2 year)

For ISyE seniors wanting to pursue a thesis and PhD Minimum 30 credits (ISyE Undergraduate Credits cannot be used); Continue your education and obtain a Master of Science in Industrial and Systems Engineering degree. One advantage of this option is the opportunity to explore an area of interest in more depth and more comprehensively. GRE exam is not required and a minimum of 3.0 GPA is required.

The areas of Industrial and Systems Engineering graduate specialization are:

1. Human Factors and Ergonomics: Combines an understanding of technology, behavioral sciences, systems analysis, and special skills in implementing organizational change. The purpose of the program is to produce graduates capable of analyzing and designing the complex systems involving people at work. Graduates will have competence in both the social and technological aspects of a problem and be aware of new innovative ideas of work organization appearing around the world.

2. Quality Engineering: Designed to provide the necessary background for a professional career in industry or government. Emphasis is placed on the foundations of quality improvement: organizational dynamics, change strategies, business and statistical methods. The list of elective courses is flexible enough to enable the student to specialize in the skills of manufacturing systems, sociotechnical engineering, health systems, and decision sciences.
3. **Manufacturing & Production Systems Engineering**: Intended to provide the skills and expertise necessary to compete successfully in a manufacturing environment. These skills include knowledge of manufacturing processes and machines and their control, knowledge of the essentials of manufacturing systems design and analysis, and knowledge and “hands-on” experience with modern manufacturing technology. After satisfying the necessary breadth requirements of the program, students may choose to study, in more depth, a number of specialized topics from the approved course offerings to enhance their career readiness.

4. **Decision Science/Operations Research (DS/OR)**: Aims to improve the quality of decisions about the management of scarce resources. Problem solving in ISYE entails recognizing and identifying decision problems as well as generating, evaluating, choosing, and implementing solutions to them. The DS/OR area seeks to train students in the methodology used in decision science and operations research, in order to prepare them for careers in government and industry.

5. **Health Systems Engineering**: This option seeks to train students to look at a broad range of issues in health care, including inpatient and outpatient care, health promotion and prevention, long-term care, quality improvement and management, health care technology, patient safety, and program and system evaluation.

**Doctor of Philosophy Degree in Industrial Engineering**
Can be pursued directly after obtaining a bachelor’s degree but students will want to have a research background as an undergraduate before making the decision to directly pursue a PhD program after graduation. Most faculty advisors will recommend that the student earn their master’s degree along the way to a PhD. This plan takes approximately 4 years to complete.

**Application Requirements:**
Application requirements are the same as the 30 credit Master’s Thesis/Research program, but must include resume or CV and an ISyE Faculty member must agree to serve as your advisor.

**Master of Business Administration (MBA)**
A popular option for ISyE graduates is to pursue a Master of Business Administration (MBA).

Some graduates may find it advantageous to enter the program directly after graduation; others may work on the degree part time through the evening MBA program; others may return to school full time after working in industry. The MBA program at UW-Madison’s School of Business requires a number of foundation courses and significant prior work experience. These courses, plus 28 advanced credits, are necessary for the degree.

More information: [http://bus.wisc.edu/mba](http://bus.wisc.edu/mba)
ADDITIONAL USEFUL UW-MADISON WEB RESOURCES

Academic Calendar  https://secfac.wisc.edu/academic-calendar/
Adult and Student Services  http://www.dcs.wisc.edu/info/
Associated Students of Madison  http://www.asm.wisc.edu/
Bursar’s Office  http://www.bussvc.wisc.edu/bursar/bursar.html
Campus Safety  http://www.safeu.wisc.edu/
Child Care and Family Resources  http://occfr.wisc.edu/
Code of Conduct  https://www.students.wisc.edu/doso/students/
College of Engineering Student Services  https://www.engr.wisc.edu/academics/student-services/
Commencement  http://commencement.wisc.edu/
Computer-Aided Engineering  http://www.cae.wisc.edu/
Course Guide  http://public.my.wisc.edu/portal/render.userLayoutRootNode.uP
Information Technology, Division of Innovation Days  http://www.doit.wisc.edu/
International Student Services  http://iss.wisc.edu/
Job Center, UW Student  http://jobcenter.wisc.edu/
LGBT Campus Center  http://lgbt.wisc.edu/
Morgridge Center for Public Service  https://morgridge.wisc.edu/
Multicultural Student Center  http://msc.wisc.edu/msc/
New-Student Programs  http://www.newstudent.wisc.edu/
Office of Equity and Diversity (OED)  http://www.oed.wisc.edu/
Recreational Sports, Division of  http://www.recsports.wisc.edu/
Registrar, Office of the  http://www.registrar.wisc.edu/
SAFE Nighttime Services  http://transportation.wisc.edu/transportation/safeservices.aspx
Schedule of Classes  http://registrar.wisc.edu/schedule_of_classes.htm
Software Training for Students  http://www.doit.wisc.edu/training/student/
Steuber Prize for Excellence in Writing  https://tc.engr.wisc.edu/competitions/entering-the-steuber-prize-for-excellence-in-writing/
Student Financial Aid, Office of  http://www.finaid.wisc.edu/
Student Health Insurance Plan (SHIP)  http://www.uhs.wisc.edu/ship/
Student Life, Division of  http://students.wisc.edu/
Student Shop, College of Engineering  http://coestudentshop.engr.wisc.edu/
Transfer Student Information  https://www.admissions.wisc.edu/apply/transfer/
Transportation Services  https://transportation.wisc.edu/home.aspx
Undergraduate Catalog  http://pubs.wisc.edu/ug/
University Apartments  http://www.housing.wisc.edu/universityapartMents/
University Health Services  https://www.uhs.wisc.edu/
University Housing  http://www.housing.wisc.edu/
University Police Department  http://www.uwpd.wisc.edu/
Veteran Services  http://veterans.wisc.edu/index.htm
Visitor and Information Programs  http://www.vip.wisc.edu/
Wendt Library  http://wendt.library.wisc.edu/
Wisconsin Experience  https://students.wisc.edu/wisconsin-experience/
Wisconsin Union  http://www.union.wisc.edu/
www.engr.wisc.edu/isye.html