# INDUSTRIAL ENGINEERING: SYSTEMS ENGINEERING AND ANALYTICS, MS

## REQUIREMENTS

## MINIMUM GRADUATE SCHOOL REQUIREMENTS

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

## NAMED OPTION REQUIREMENTS
### MODE OF INSTRUCTION

| Face to Face | Evening/Weekend | Online | Hybrid | Accelerated |
| --- | --- | --- | --- | --- |
| Yes | No | No | No | Yes |

### Mode of Instruction Definitions

**Accelerated:** Accelerated programs are offered at a fast pace that condenses the time to completion. Students typically take enough credits aimed at completing the program in a year or two.

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

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

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

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

## CURRICULAR REQUIREMENTS

| Requirement | Detail |
| --- | --- |
| Minimum Credit Requirement | 30 credits |
| Minimum Residence Credit Requirement | 16 credits |
| Minimum Graduate Coursework Requirement | 15 credits must be graduate-level coursework. Refer to the Graduate School: Minimum Graduate Coursework (50%) Requirement policy: https://policy.wisc.edu/library/UW-1244 (https://policy.wisc.edu/library/UW-1244/). |
| Overall Graduate GPA Requirement | 3.00 GPA required. Refer to the Graduate School: Grade Point Average (GPA) Requirement policy: https://policy.wisc.edu/library/UW-1203 (https://policy.wisc.edu/library/UW-1203/). |
| Other Grade Requirements | Grades of C and D received by a candidate in any graduate course will not be counted as credit toward the degree. These grades will be counted in the graduate GPA. |
| Assessments and Examinations | None. |
| Language Requirements | No language requirements. |

## REQUIRED COURSES

Of the required credits, all must be numbered 300 or higher. At most, 6 credits may be numbered 300-399, at least 15 must be at the graduate level, at least 18 credits must be in the Industrial and Systems Engineering Department, and at least 16 credits must be taken as a graduate student in residence at UW-Madison. At most, 6 credits total from independent study (e.g., I SY E 699), research (e.g., I SY E 790), and internship/co-op (I SY E 702) courses may be applied toward this degree.

Below is a typical curriculum for those pursuing an MS in Industrial Engineering with a course option in Systems Engineering and Analytics. Please note the Systems Engineering and Analytics program is a customizable program and students should work out other course options with their faculty advisor.

### Fall Potential Courses

| Code | Title | Credits |
| --- | --- | --- |
| I SY E 313 | Engineering Economic Analysis | 3 |
| I SY E 412 | Fundamentals of Industrial Data Analytics | 3 |
| I SY E/COMP SCI/MATH  425 | Introduction to Combinatorial Optimization | 3 |
| I SY E/M E  510 | Facilities Planning | 3 |
| I SY E/M E  512 | Inspection, Quality Control and Reliability | 3 |
| I SY E 515 | Engineering Management of Continuous Process Improvement | 3 |
| I SY E/COMP SCI/E C E  524 | Introduction to Optimization | 3 |
| I SY E/COMP SCI/MATH/STAT  525 | Linear Optimization | 3 |
| I SY E 601 | Special Topics in Industrial Engineering | 1-3 |
| I SY E 603 | Special Topics in Engineering Analytics and Operations Research | 1-3 |
| I SY E 604 | Special Topics in Manufacturing and Supply Chain Management | 1-3 |
| I SY E 605 | Computer Integrated Manufacturing | 3 |
| I SY E 624 | Stochastic Modeling Techniques | 3 |
| I SY E/MATH/OTM/STAT  632 | Introduction to Stochastic Processes | 3 |

| I SY E 645 | Engineering Models for Supply Chains | 3 |
| I SY E/PSYCH 653 | Organization and Job Design | 3 |
| I SY E 699 | Advanced Independent Study | 1-5 |
| I SY E/INFO SYS 722 | Computer-Based Data Management | 3 |

### Spring Potential Courses

| Code | Title | Credits |
| --- | --- | --- |
| I SY E 313 | Engineering Economic Analysis | 3 |
| I SY E 412 | Fundamentals of Industrial Data Analytics | 3 |
| I SY E/M E 512 | Inspection, Quality Control and Reliability | 3 |
| I SY E 516 | Introduction to Decision Analysis | 3 |
| I SY E 517 | Decision Making in Health Care | 3 |
| I SY E/COMP SCI/ E C E 524 | Introduction to Optimization | 3 |
| I SY E/COMP SCI/ MATH/STAT 525 | Linear Optimization | 3 |
| I SY E 562 | Human Factors of Data Science and Machine Learning | 3 |
| I SY E 575 | Introduction to Quality Engineering | 3 |
| I SY E 601 | Special Topics in Industrial Engineering | 1-3 |
| I SY E 603 | Special Topics in Engineering Analytics and Operations Research | 1-3 |
| I SY E 604 | Special Topics in Manufacturing and Supply Chain Management | 1-3 |
| I SY E 612 | Information Sensing and Analysis for Manufacturing Processes | 3 |
| I SY E 615 | Production Systems Control | 3 |
| I SY E 620 | Simulation Modeling and Analysis | 3 |
| I SY E/M E 641 | Design and Analysis of Manufacturing Systems | 3 |
| I SY E/M E 643 | Performance Analysis of Manufacturing Systems | 3 |
| I SY E 699 | Advanced Independent Study | 1-5 |

### Summer Potential Courses

| Code | Title | Credits |
| --- | --- | --- |
| I SY E 313 | Engineering Economic Analysis | 3 |
| I SY E 516 | Introduction to Decision Analysis | 3 |
| I SY E/COMP SCI/ E C E 524 | Introduction to Optimization | 3 |
| I SY E 575 | Introduction to Quality Engineering | 3 |
| I SY E 601 | Special Topics in Industrial Engineering | 1-3 |
| I SY E 603 | Special Topics in Engineering Analytics and Operations Research | 1-3 |
| I SY E 604 | Special Topics in Manufacturing and Supply Chain Management | 1-3 |
| I SY E/MATH/OTM/ STAT 632 | Introduction to Stochastic Processes | 3 |
| I SY E 699 | Advanced Independent Study | 1-5 |

| I SY E 702 | Graduate Cooperative Education Program | 1-2 |

## Policy

Students in this program may not take courses outside the prescribed curriculum without faculty advisor and program director approval. Students in this program cannot enroll concurrently in other undergraduate or graduate degree programs.