INDUSTRIAL ENGINEERING: RESEARCH, 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	No

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

Code	Title	Credits
I SY E courses [1]		18
I SY E 790	Master's Research and Thesis	3-6
or I SY E 890	Pre-Dissertator's Research	
Electives with advisor approval		6-9
Total Credits		**30**

1. I SY E 699 Advanced Independent Study may not be used to meet degree credit requirements. Students may count up to 3 credits of I SY E 702 Graduate Cooperative Education Program
2. At most 3 credits of I SY E 702 Graduate Cooperative Education Program, may be applied to meet the credit requirements.

Students may choose to specialize in one of the below research areas. The program recommends working with your faculty advisors to answer any questions and to form a plan of study.

Operations Research, Optimization, and Analytics [1]

Code	Title	Credits
Highly Recommended Courses		
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/COMP SCI/ MATH/STAT 525	Linear Optimization	3
I SY E 620	Simulation Modeling and Analysis	3
I SY E 624	Stochastic Modeling Techniques	3

Code	Title	Credits
Other Suggested Courses		
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 512	Inspection, Quality Control and Reliability	3
I SY E 517	Decision Making in Health Care	3
I SY E 575	Introduction to Quality Engineering	3
I SY E 603	Special Topics in Engineering Analytics and Operations Research	1-3
I SY E 612	Information Sensing and Analysis for Manufacturing Processes	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 645	Engineering Models for Supply Chains	3

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

Health Systems Engineering [1]

Code	Title	Credits
Highly Recommended Courses		
I SY E 417	Health Systems Engineering	3
I SY E 517	Decision Making in Health Care	3
I SY E 606	Special Topics in Healthcare Systems Engineering	1-3
I SY E/ POP HLTH 703	Quality of Health Care: Evaluation and Assurance	1-3

Code	Title	Credits
Other Suggested Courses		
I SY E 412	Fundamentals of Industrial Data Analytics	3
I SY E 515	Engineering Management of Continuous Process Improvement	3
I SY E 516	Introduction to Decision Analysis	3
I SY E 575	Introduction to Quality Engineering	3
I SY E/ PHARMACY 608	Safety and Quality in the Medication Use System	3
I SY E 601	Special Topics in Industrial Engineering	1-3
I SY E 602	Special Topics in Human Factors [2]	3
I SY E 603	Special Topics in Engineering Analytics and Operations Research	1-3
I SY E 615	Production Systems Control	3
I SY E/B M I 617	Health Information Systems	3
I SY E 620	Simulation Modeling and Analysis	3
I SY E 624	Stochastic Modeling Techniques	3
I SY E/M E 643	Performance Analysis of Manufacturing Systems	3
I SY E/M H R 729	Behavioral Analysis of Management Decision Making	3
I SY E 555	Human Performance and Accident Causation	3
I SY E/ POP HLTH 875	Cost Effectiveness Analysis in Health and Healthcare	3
B M I/ COMP SCI 576	Introduction to Bioinformatics	3
B M I 773	Clinical Research Informatics	3
B M I/ COMP SCI 776	Advanced Bioinformatics	3
OTM 753	Healthcare Operations Management	3
ED PSYCH 711	Current Topics in Educational Psychology	1-3
NURSING 761	Health Program Planning, Evaluation, and Quality Improvement	3
POP HLTH/ SOC 797	Introduction to Epidemiology	3
POP HLTH 876	Measuring Health Outcomes	3
PSYCH 610	Design and Analysis of Psychological Experiments I	4
PSYCH 710	Design and Analysis of Psychological Experiments II	4
STAT/F&W ECOL/ HORT 571	Statistical Methods for Bioscience I	4
STAT/B M I 641	Statistical Methods for Clinical Trials	3

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[2] Topics vary for this course. Obtain advance approval from your faculty advisor.

Human Factors and Ergonomics [1]

Code	Title	Credits
Highly Recommended Courses		
I SY E/COMP SCI/ DS 518	Wearable Technology	3
I SY E/PSYCH 549	Human Factors Engineering	3
I SY E 552	Human Factors Engineering Design and Evaluation	3
I SY E 555	Human Performance and Accident Causation	3
I SY E 562	Human Factors of Data Science and Machine Learning	3
I SY E/B M E 564	Occupational Ergonomics and Biomechanics	3
I SY E 601	Special Topics in Industrial Engineering [2]	1-3
I SY E 602	Special Topics in Human Factors	3
I SY E/B M E 662	Design and Human Disability and Aging	3
I SY E 699	Advanced Independent Study	1-5
I SY E/PSYCH 854	Special Topics in Organization Design	1-3
I SY E/PSYCH 859	Special Topics in Human Factors Engineering	1-3
I SY E 961	Graduate Seminar in Industrial Engineering	1-3
CIV ENGR 679	Special Topics in Transportation and City Planning	3

Various courses count as "Tools and Methods." The HFE faculty group updates the list of "Tools and Methods" courses and advisors decide which set of courses are appropriate for each student. The following are categories of "Tools and Methods": Research Methods, Statistics,

Qualitative Research, Biomechanics Methods, and Psychology. Students can work with their faculty advisor for non-I SY E course work.

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2 Topics vary for this course. Obtain advance approval from your faculty advisor.

Advanced Manufacturing and Industrial AI [1]

Code	Title	Credits
Highly Recommended Courses		
I SY E 412	Fundamentals of Industrial Data Analytics	3
I SY E 415	Introduction to Manufacturing Systems, Design and Analysis	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 575	Introduction to Quality Engineering	3
I SY E 601	Special Topics in Industrial Engineering [2]	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 612	Information Sensing and Analysis for Manufacturing Processes	3
I SY E 615	Production Systems Control	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 645	Engineering Models for Supply Chains	3
STAT/M E 424	Statistical Experimental Design	3

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2 Topics vary for this course. Obtain advance approval from your faculty advisor.