

University of Wisconsin – Milwaukee
College of Engineering and Applied Science
INDUSTRIAL ENGINEERING CURRICULUM

The minimum number of credits required to complete the Bachelor of Science in Engineering with a major in Industrial Engineering is 125 credits. Students who need background preparation courses may need additional credits. See information below regarding placement examinations.

Engineering Core Courses (29 credits)		Credits	Prerequisite
EAS 100	CEAS Freshman Orientation (recommended only)	1	none
EAS 200	Professional Seminar	1	none
Ind Eng 111 ¹	Introduction to Engineering	3	Math 116 (C)
Ind Eng 112 ¹	Engineering Drawing & CAD/Drafting	3	Math 116
Ind Eng 360	Engineering Economic Analysis	3	Jr St
CompSci 201	Introductory Computer Programming	3	Math 105
Civ Eng 201	Statics	3	Math 232
Civ Eng 202	Dynamics	3	Civ Eng 201, Math 233 (C)
MatlEng 201	Engineering Materials	4	Chem 105 or 102 or 117
ElecEng 301	Electrical Circuits I	3	Physic 210(C), ElecEng 234(C)
MechEng 301	Basis Engineering Thermodynamics	3	Math 233, Physics 209

*Industrial Engineering Major (33 credits)			
Ind Eng 350	Manufacturing Processes	3	MatlEng 201
Ind Eng 370	Introduction to Operations Analysis	3	Math 233 (P)
Ind Eng 455	Operations Research I	3	Jr St, Math 233
Ind Eng 465	Operations Research II	3	Jr St, Ind Eng 455, 467
Ind Eng 467	Intro. Statistics for Physical Science and Engineering Students	3	Jr St, Math 233
Ind Eng 470	Methods Engineering	3	Jr St, Ind Eng 370
Ind Eng 475	Simulation Methodology	3	Jr St; Ind Eng 370, 467
Ind Eng 485	Senior Design Project	3	Sr St, Ind Eng 360, 370, 455, 467, 475, 465(C), 470(C), 571(C), 580(C), 583(C)
Ind Eng 571	Quality Control & Design of Experiments I	3	Jr St, Ind Eng 467
Ind Eng 580	Ergonomics	3	Jr St
Ind Eng 583	Facility Layout and Material Handling	3	Sr. St, Ind Eng 370

**Mathematics (14-16 credits)		(16 credits typical: Math 231,232,233, ElecEng 234)	
One of the following Calculus sequences must be completed:			
Math 231-232-233		12	Math placement score, or previous course with at least "C" grade.
Math 221- 222 (Honors)		10	
And ElecEng 234 (Analytical Methods in Engineering)		4	Math 233 (P)

**Natural Science Requirement (16 - 18 credits)			
Chem 102-104		10	Chem 100 with "C" grade or Chemistry placement test
or			
Chem 105 and		5	Chem 100 with "C" grade or Chemistry placement test
Approved Natural Science Elective ** (minimum 3 cr)		3	
Physics 209 – 210		8	Math 232 (C)

General Education Requirements			
<i>Distribution Requirements (15 credits)</i>			
Art		3	none
Humanities		6	none
Social Science		6	none
One of the arts, humanities, or social science courses selected must also meet the UWM cultural diversity requirement . <i>(Commun 103 Public Speaking or Commun 105 Business and Professional Communication are recommended as part of the distribution requirements)</i>			
Free Elective		4	
<i>Competency Requirements</i>			
**English Composition (0-6 credits)			
The English Composition requirement is satisfied by:			
1. Earning a satisfactory score on the English placement test, or			
2. Earning a grade of C or higher in English 102, or			
3. Transferring a grade of C or better in a course equivalent to English 102 or higher level expository writing course			
Foreign Language (0-8 credits) (for new freshman starting fall 1999)			
The foreign language requirement can be completed with one of these options:			
1. Two years of a single foreign language in high school			
2. Two semesters of a single foreign language in college			
3. Demonstrate ability by examination			

*** Advancement to Major:** 1. Complete a minimum of 24 credits required for major. (Excludes: general education, prerequisite and orientation courses). 2. Complete Math 232 (or 222) with "C" or better grade. 3. Complete EAS 200 Professional Seminar. 4. Complete the English composition requirement. 5. Obtain a 2.0 GPA in all courses in item 1. **The program may impose major status as a prerequisite for courses numbered 300 or above.**

**** Placement Examinations:** Students without previous college level credits in Math, Chemistry or English may be required to take placement exams. The results of these tests determine the appropriate course in which to register. Background prerequisite courses may be required in addition to the courses listed above.

¹ MechEng 110 & 111 may substitute for Ind Eng 111 & 112 for transferring students.

Technical Electives—Industrial Engineering Major.

The industrial engineering program requires a total of 12 credits of technical electives, chosen from the following list.

	<u>Credits</u>	<u>Prerequisite</u>
Ind Eng 390 Senior Thesis	1- 3	Sr St, Cons Instr
Ind Eng 450 Computer Aided Manufacturing and Robotics	3	Ind Eng 350, 360 (C)
Ind Eng 540 Expert Systems for Engineering Applications	3	CompSci 151 or 152
Ind Eng 555 Manufacturing Systems Integration	3	Jr St, Ind Eng 450
Ind Eng 572 Reliability Engineering	3	Jr St, Ind Eng 467
Ind Eng 575 Design of Experiments	3	Sr St, Ind Eng 467
Ind Eng 590 Topics in Industrial and Systems Engineering	1-3	Sr St
Ind Eng 671 Quality Control & Design of Experiments II	3	Sr St, Ind Eng 571
Ind Eng 699 Independent Study	1-3	Jr St, Cons Instr
Bus Adm 330 Organizations	3	Jr St
Bus Adm 473 Business Logistic Management	3	Jr St, Bus Adm 370
EAS 001 Co-op Work Period	3 ¹	Prior Cons Co-op Dir
MechEng 474/ ElecEng 474 Introduction to Control Systems	4	Sr St, ElecEng 234,301,Civ Eng 202

¹This option is only open to students who earn **3 or more** credits of Co-op.

Frequency of Course Offerings:

The required courses with Ind Eng course numbers are offered at least once a year. Ind Eng 111, 112, 360, 467, 485 are offered in both Fall and Spring semesters. Ind Eng 350, 370, 455, 470 and 583 are offered in the Fall semester and Ind Eng 465, 475, 485, 571 and 580 are offered in the Spring semester. At least two electives are offered each semester.

****Approved Natural Science Elective Courses**

Atmospheric Science (100 level or above)
Biological Sciences (150 or above)
Physics (300 level or above)
Conservation & Environment Studies 210
Geosciences (100, 102, 150 or above)
Math (240, 300 or above)

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