

**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.

<b>Engineering Core Courses (29 credits)</b>		<b>Credits</b>	<b>Prerequisite</b>
EAS 100	CEAS Freshman Orientation	1	none
EAS 200	Professional Seminar	0	none
Ind Eng 101	Fundamentals of Graphics	3	Math 105 (C)
Ind Eng 210	Introduction to Design Techniques	3	Soph St
Ind Eng 360	Engineering Economic Analysis	3	Jr St
CompSci 153	Introduction to Scientific Programming in C++	3	Math 231 (C) or 226 (C)
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

<b>Industrial Engineering Major (33 credits)</b>			
Ind Eng 350	Manufacturing Processes	3	MatlEng 201
Ind Eng 370	Introduction to Industrial & Manufacturing Engineering	3	Jr St
Ind Eng 450	Computer-Aided Manufacturing and Robotics	3	Ind Eng 350, 360
Ind Eng 455	Basic Optimization Techniques	3	Jr St, ElecEng 234
Ind Eng 465	Operations Analysis	3	Jr St, Ind Eng 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 360
Ind Eng 475	Introduction to Simulation Methodology	3	Ind Eng 467
Ind Eng 485	Senior Design Project	3	Sr St, Ind Eng 370,467, 450 (C),465 (C),470 (C)
Ind Eng 571	Quality Control & Design of Experiments I	3	Jr St, Ind Eng 467
Ind Eng 580	Introduction to Ergonomics	3	Jr St

<b>*Mathematics (14-16 credits)</b>		(16 credits typical: Math 231,232,233, ElecEng 234)
One of the following <b>Calculus</b> 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)

<b>*Natural Science Requirement (16 - 18 credits)</b>		
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	

<b>General Education Requirements</b>		
<i>Distribution Requirements (15 credits)</i>		
<b>Art</b>	3	none
<b>Humanities</b>	6	none
<b>Social Science</b>	6	none
One of the arts, humanities, or social science courses selected must also meet the <b>UWM cultural diversity requirement</b> . <i>(Commun 103 Public Speaking or Commun 105 Business and Professional Communication are recommended as part of the distribution requirements)</i>		
<b>Free Elective</b>	4	
<i>Competency Requirements</i>		
<b>*English Composition (0-6 credits)</b>		
The English Composition requirement is satisfied by:		
1. Earning a satisfactory score on the English placement test, <b>or</b>		
2. Earning a grade of C or higher in English 102		
<b>Foreign Language (0-8 credits)</b> (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		

**\*Placement Examinations**  
Once admitted to UWM, most engineering students are required to take placement examinations in mathematics, English and chemistry. Students with previous college level credits in these areas may not be required to take placement exams. The placement exams are administered by the UWM Testing Center, Mellencamp Hall, room B28, (414) 229-4689. The results of these tests help students determine the appropriate course in which to register. Background prerequisite courses may be required in addition to the courses listed above. Possible Math placements for engineering students are Math 090-095-105-116-117-225-231-221. Possible English placements are English 090-095-101-102. Possible Chemistry placements are Chemistry 100,102, or 105.

## Technical Electives—Industrial Engineering Major.

The industrial engineering program requires a total of 12 credits of technical electives, chosen from the following list. At least 6 credits must be in courses from the Industrial and Manufacturing Engineering Department.

		<u>Credits</u>	<u>Prerequisite</u>
ElecEng 367	Introduction to Microprocessors	4	ElecEng 354, CompSci 151 or 152
Ind Eng 540	Expert Systems for Engineering Applications	3	CompSci 151 or 152
IndEng 545	Metal Cutting	3	Sr St, IE 350 or MatEng 330
IndEng 547	Nontraditional Manufacturing Processes	3	Sr St, IE 350 or MatEng 330
Ind Eng 550	Control of Automated Manufacturing Systems	3	Jr St, Ind Eng 450 (R)
Ind Eng 555	Manufacturing Systems Integration	3	Jr St, Ind Eng 450 (R)
Ind Eng 572	Reliability Engineering	3	Jr St, Ind Eng 467
Ind Eng 583	Plant Layout and Material Handling	3	Sr St, Ind Eng 370
Ind Eng 671	Quality Control & Design of Experiments II	3	Sr St, Ind Eng 571
Matl 330	Materials Processing	3	MatlEng 201
Matl 421	Metal Casting Engineering	3	Jr St, MatlEng 201
Matl 431	Welding Engineering	3	Jr St, MatlEng 201

The following courses can be taken as technical electives only with prior written approval from the chairperson of the IE/MFG Committee in the Industrial and Manufacturing Engineering Department.

EAS 001	Co-op Work Period	3 <sup>1</sup>
Ind Eng 390	Senior Thesis	1-3
Ind Eng 590	Topics in Industrial and Systems Engineering	3
Ind Eng 699	Independent Study	3

<sup>1</sup>This option is only open to students who earn **3 or more** credits of Co-op. Students may then apply to the Industrial and Manufacturing Engineering coordinator for approval to use 3 of these credits as technical electives.

### Frequency of Course Offerings:

The required courses with Ind Eng course numbers are offered at least once a year. Ind Eng 101, 210, 360, 467, 485 are offered in both Fall and Spring semesters. Ind Eng 350, 370, 455, 465, and 470 are offered in the Fall semester and Ind Eng 450, 475, and 580 are offered in the Spring 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)

**College of Engineering and Applied Science**  
**University of Wisconsin – Milwaukee**  
**P.O. Box 784**  
**Milwaukee, WI 53201**

Office of Student Services (414) 229-4667  
Engineering & Mathematical Science Building (EMS) Room E386  
Department of Industrial and Manufacturing Engineering (414) 229-4967  
Engineering & Mathematical Science Building (EMS) Room E308

Web Site: [www.ceas.uwm.edu](http://www.ceas.uwm.edu)