

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

The minimum number of credits required to complete the Bachelor of Science in Engineering with a major in Mechanical Engineering is 128 credits. Students who need background preparation courses may need additional credits. See information below regarding placement examinations.

**Engineering Core Courses (34 credits)**

		<b><u>Credits</u></b>	<b><u>Prerequisite</u></b>
Civ Eng 201	Statics	3	Math 232
Civ Eng 202	Dynamics	3	Civ Eng 201, Math 233(C)
Civ Eng 303	Strength of Materials	4	Civ Eng 201, Math 233(C)
EAS 200	Professional Seminar	1	None
ElecEng 301	Electrical Circuits I	3	Physics 210(C)
MatlEng 201	Engineering Materials	4	Chem 102 or 105
MechEng 101	Computational Tools for Engineers	2	Math 221(C) or 231(C)
MechEng 110	Engineering Fundamentals I	4	Math 225(C) or 231(C), Admission to CEAS
MechEng 111	Engineering Fundamentals II	4	MechEng 110, Admission to CEAS
MechEng 301	Basic Engineering Thermodynamics	3	Math 233, Physics 209
MechEng 320	Introduction to Fluid Mechanics	3	Civ Eng 202, ElecEng 234, MechEng 301(C)

**^Mechanical Engineering Major (33 credits)**

Ind Eng 367	Intro Statistics for Physical Science & Engineering	3	B- of better Math 211 or 213; C or better Math 221 or 231
Matl Eng 330	Materials & Processes in Manufacturing	3	MatlEng 201
MechEng 321	Basic Heat Transfer	4	Jr St, MechEng 301
MechEng 323	Fluid Mechanics Laboratory	1	Jr St, MechEng 320
MechEng 360	Mechanical Design I	3	Civ Eng 202, MechEng 101, 111
MechEng 366	Design of Machine Elements	4	Civ Eng 303, MatlEng 201, MechEng 101, 111
MechEng 370	Computer Aided Engineering Laboratory	2	Civ Eng 202, 303, ElecEng 234, MechEng 101, 111
MechEng 438	Mechanical Engineering Experimentation	3	Sr St, ElecEng 301, Ind Eng 367, MechEng 321, 360, 366
MechEng 474	Introduction to Control Systems	4	Sr St, Civ Eng 202*, Elec Eng 234*, 301
MechEng 479	Control & Design of Mechatronic Systems	3	Sr St, ElecEng 474 or Mech Eng 474
MechEng 405	Product Realization	3	Jr St, MechEng 321, 360, 366, 370
or			
MechEng 496	Senior Design Project	3	MechEng 321, 360, 366, 370

**^^Mathematics (14-16 credits)**

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

**^^Chemistry (5-10 credits)**

One of the following courses must be completed:		
Chem 105 (Suggested) or Chem 102-104	5	Chem 100* or Chemistry Placement; Math 105* or 108*

**Physics (10 credits)**

Physics 209 & 214 (Lab), and Physics 210 & 215 (Lab)	10	Physics 209: Math 232(C) Physics 210: Math 233(C), C- or better in Physics 209
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**General Education Requirements**

*Distribution Requirements (15 credits)*

<b>Art</b>		3	
<b>Humanities</b>		3	
<b>Social Science</b>		6	
<b>English 310</b>	Writing, Speaking & Technoscience in the 21 <sup>st</sup> Century	3	English Competency

**Cultural Diversity** - One of the arts, humanities, or social science courses selected must also meet the UWM cultural diversity requirement.

*Competency Requirements*

**^^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

**\*C or better in prerequisite**

**(C) Concurrent Enrollment in Designated Course**

**^Admission to Major:** 1. Complete Math 231 (or 221) with C or better grade. 2. Complete the English composition requirement (OWCA) 3. Complete Chem 100 with C or better grade or satisfactory placement score. 4. Obtain a minimum GPA as set by the department. A 3.00 GPA guarantees admission to any CEAS major. Courses may be repeated only once. No more than two courses may be repeated.

**The program may impose major status as a prerequisite for courses numbered 200 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.

## Technical Electives – Mechanical Engineering Major

The Mechanical Engineering program requires a total of 15 credits of technical electives, chosen as follows.

**Group A Technical Electives:** Students must select at least 6 credits from this category.

		<u>Credits</u>	<u>Prerequisite</u>
MechEng 402	Thermal-Fluid Engineering	3	MechEng 320, 321
MechEng 420	Fluid Mechanics	3	Jr St, MechEng 320
MechEng 462	Intermediate Design of Machinery	3	Jr St, MechEng 366
MechEng 463	Introduction to Finite Elements	3	Jr St, Civ Eng 303, ElecEng 234, MechEng 320(C), 321(C)
MechEng 475	Vibrations in Mechanical Design	3	Sr St, Civ Eng 202, ElecEng 234

**Group B Technical Electives:**

Civ Eng 401	Intermediate Strength of Materials	3	Jr St, Civ Eng 303
Ind Eng 455	Operations Research I	3	Jr St, Math 233
MatlEng 380	Engineering Basis for Materials Selection	3	MatlEng 201
MatlEng 410	Mechanical Behavior of Materials	3	Jr St, MatlEng 201
Math 413	Introduction to Numerical Analysis	3	Jr St, Math 233(C), 234(C) or ElecEng 234(C)
Math 601	Advanced Engineering Mathematics	3	Jr St, ElecEng 234 or Math 234
Mech Eng 405	Product Realization <sup>1</sup>	3	Jr St, IndEng 350, 360, 370 or MechEng 321, 360, 366, 370
MechEng 411	Heat Transfer	3	Jr St, MechEng 321
MechEng 415	Modern Thermo Manufacturing Processes	3	Jr St, Civ Eng 303, MechEng 321
MechEng 423	Applied Fluid Mechanics	3	Jr St, MechEng 320
MechEng 425	Aerodynamics of Wind Turbines	3	Jr St, MechEng 320
MechEng 430	Energy Modeling	3	Jr St
MechEng 432	Internal Combustion Engines	3	Jr St, MechEng 301
MechEng 434	Air Conditioning System Design	3	Jr St, Ind Eng 210, MechEng 321
MechEng 435	Power Plant Theory & Design	3	Jr St, MechEng 301
MechEng 436	Solar Engineering	3	Jr St, MechEng 301
MechEng 455	Processing of Plastics	3	MechEng 320,321
MechEng 456	Metal Casting Engineering	3	Jr St, MatlEng 201
MechEng 457	Engineering Composites	3	Jr St, MatlEng 201
MechEng 460	Nanomaterials & Nanomanufacturing	3	Jr St, MatlEng 201
MechEng 461	Intermediate Kinematics & Dynamics	3	Jr St, MechEng 360
MechEng 465	Friction & Wear	3	Jr St, MatlEng 201
MechEng 466	Mechanics of Composite Materials	3	Jr St, Civ Eng 303
MechEng 469	Introduction to Biomechanical Engineering	3	Civ Eng 202, 303
MechEng 472	Introduction to Wind Energy	3	Jr St
MechEng 476	Introduction to Robotics	3	ElecEng 234, MechEng 360
MechEng 490	Topics in Mechanical Engineering	1-3	Jr St, Cons Instr
MechEng 574	Intermediate Control Systems	3	Sr St, ElecEng 474 or MechEng 474
MechEng 580	Engineering Analysis in Applied Mech.	1-3	Jr St, ElecEng 234
MechEng 584	Biodynamics of Human Motion	3	Jr St, ElecEng 234
MechEng 699	Independent Study	1-3 <sup>2</sup>	

<sup>1</sup> Credits for group B count if course not used as a substitution for ME 496.

<sup>2</sup> Students who earn **3 or more** credits of MechEng 699 may use only 3 of those credits as approved Group B electives.

**Group C Technical Electives:** Students may take up to maximum of 3 credits in this category.

BusAdm 447	Entrepreneurship	3	Jr St, BusAdm 350
EAS 001	Co-op Work Period	3	Prior Cons Co-Op Dir
EAS 497	Study Abroad	3	Acceptance to Study Abroad Program
Ind Eng 360	Engineering Economic Analysis	3	Jr St
MechEng 490	Professional development topics such as Innovation & Commercialization, Tech Comm for Eng & Science	3	Jr St, Cons Instr
MechEng 542	Introduction to Technological Entrepreneurship	3	Jr St, Admission to Major
MechEng 543	Intro to Tech Mgmt & Innovation	3	Jr St, Admission to Major
MechEng 544	New Product Development	3	Jr St, Admission to Major
MechEng 546	Global Innovation Management	3	Jr St, Admission to Major
MechEng 548	Technology Venturing Project	3	Jr St, BusAdm/MechEng 542, Admission to Major

**\*C or better in prerequisite**

**(C) Concurrent Enrollment in Designated Course**

**Degree Requirements:** Students must maintain an average GPA of at least 2.0 on all work attempted at the University and in all courses offered by the College. Students majoring in Mechanical Engineering must maintain an average GPA of at least 2.5 in all 300-level and above courses in the Mechanical Engineering department. Transferable courses will be included as appropriate. Advancement to major status is required for graduation.

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