

MECHANICAL ENGINEERING, B.S.

REQUIREMENTS

UNIVERSITY GENERAL EDUCATION REQUIREMENTS

All undergraduate students at the University of Wisconsin–Madison are required to fulfill a minimum set of common university general education requirements to ensure that every graduate acquires the essential core of an undergraduate education. This core establishes a foundation for living a productive life, being a citizen of the world, appreciating aesthetic values, and engaging in lifelong learning in a continually changing world. Various schools and colleges will have requirements in addition to the requirements listed below. Consult your advisor for assistance, as needed. For additional information, see the university Undergraduate General Education Requirements (<http://guide.wisc.edu/undergraduate/#requirementsforundergraduatestudytext>) section of the *Guide*.

General Education	• Breadth–Humanities/Literature/Arts: 6 credits
	• Breadth–Natural Science: 4 to 6 credits, consisting of one 4- or 5-credit course with a laboratory component; or two courses providing a total of 6 credits
	• Breadth–Social Studies: 3 credits
	• Communication Part A & Part B *
	• Ethnic Studies *
	• Quantitative Reasoning Part A & Part B *

* The mortarboard symbol appears before the title of any course that fulfills one of the Communication Part A or Part B, Ethnic Studies, or Quantitative Reasoning Part A or Part B requirements.

SUMMARY OF REQUIREMENTS

The following curriculum applies to undergraduate students admitted to the Mechanical Engineering degree program in Fall 2023 or later.

Code	Title	Credits
	Mathematics and Statistics	19
	Basic Science	13-14
	Non–Mechanical Engineering	6
	Mechanical Engineering Core	53-54
	Technical Electives	12
	Math/Science Electives	3
	Communication Skills	6
	Liberal Studies	15
	<i>Total Credits</i>	<i>Minimum 128</i>

MATHEMATICS/STATISTICS¹

Code	Title	Credits
MATH 221	Calculus and Analytic Geometry 1	5
MATH 222	Calculus and Analytic Geometry 2	4

MATH 234	Calculus--Functions of Several Variables	4
MATH 320	Linear Algebra and Differential Equations	3
STAT 324	Introductory Applied Statistics for Engineers	3
or I SY E 210	Introduction to Industrial Statistics	

Total Credits 19

1

All students must have the equivalent of the above courses. If the above requirement is fulfilled with fewer than 19 credits, additional math/science credits may be needed to meet the math/science auxiliary credit condition.

Transfer students may fulfill the statistics requirement with other statistics courses having a calculus prerequisite and the approval of the mechanical engineering department via a Course Substitution Form.

BASIC SCIENCE¹

Code	Title	Credits
Select one of the following:		4-5
CHEM 103	General Chemistry I	
CHEM 109	Advanced General Chemistry	
COMP SCI 220	Data Science Programming I	4
PHYSICS 202	General Physics ²	5

Total Credits 13-14

1

Basic science courses, excluding Computer Science courses, are included in the math/science auxiliary credit condition.

2

Students following the normal M E course sequence need not take PHYSICS 201 General Physics to satisfy the prerequisites for PHYSICS 202 General Physics.

NON-MECHANICAL ENGINEERING

Code	Title	Credits
E M A 201	Statics (with a grade of C or better)	3
M S & E 350	Introduction to Materials Science	3

Total Credits 6

MECHANICAL ENGINEERING CORE

Code	Title	Credits
M E 201	Introduction to Mechanical Engineering	3
M E 231	Geometric Modeling for Design and Manufacturing	3
M E 240	Dynamics (with a grade of C or better)	3
M E 306	Mechanics of Materials (with a grade of C or better)	3
M E/E M A 307	Mechanics of Materials Lab	1
M E 310	Manufacturing: Polymer Processing and Engineering	3
M E 311	Manufacturing: Metals and Automation	3

M E 331	Computer-Aided Engineering	3	CIV ENGR 415	Hydrology	3
M E 340	Dynamic Systems	3	COMP SCI 300	Programming II	3
M E 342	Design of Machine Elements	3	COMP SCI 320	Data Science Programming II	4
M E 351 & M E 352	Interdisciplinary Experiential Design Projects I and Interdisciplinary Experiential Design Projects II	6	COMP SCI/ E C E 354	Machine Organization and Programming	3
M E 361	Thermodynamics (with a grade of C or better)	3	E C E 320	Electrodynamics II	3
M E 363	Fluid Dynamics	3	E C E 330	Signals and Systems	3
M E 364	Elementary Heat Transfer	3	E C E 340	Electronic Circuits I	3
M E 368	Engineering Measurements and Instrumentation	4	E C E 342	Electronic Circuits II	3
M E 370	Energy Systems Laboratory	3	E C E/ COMP SCI 352	Digital System Fundamentals	3
Choose one:		3-4	E C E 353	Introduction to Microprocessor Systems	3
M E 376	Introduction to Mechatronics		E C E/ COMP SCI 354	Machine Organization and Programming	3
E C E 376	Electrical and Electronic Circuits		E C E 355	Electromechanical Energy Conversion	3
Total Credits		53-54	E C E 356	Electric Power Processing for Alternative Energy Systems	3

TECHNICAL ELECTIVES

Code	Title	Credits
The mechanical engineering curriculum requires a total of 12 credits of technical electives. A minimum of 3 of those 12 credits must be from formal M E courses numbered 400 and higher. A formal course is defined as a class that meets regularly in a lecture format to study a selected topic. The educational mission is assisted with homework and exams. Formal courses include online courses but do not include seminar, survey, independent study, research, topics, or similar courses.		12
Additional technical electives may include formal courses in engineering, mathematics, physics, chemistry, statistics, and computer science courses numbered 400 and higher. Course choices may impact the math/science auxiliary credit condition. INTEREGR and E P D courses are limited to those listed below. The following courses are also accepted as technical electives:		
ANAT&PHY 335	Physiology	5
BSE 351	Structural Design for Agricultural Facilities	3
BSE 364	Engineering Properties of Food and Biological Materials	3
BSE/ENVIR ST 367	Renewable Energy Systems	3
CBE 320	Introductory Transport Phenomena	4
CBE 326	Momentum and Heat Transfer Operations	3
CHEM 341	Elementary Organic Chemistry	3
CHEM 343	Organic Chemistry I	3
CHEM 345	Organic Chemistry II	3
CIV ENGR 311	Hydroscience	3
CIV ENGR 320	Environmental Engineering	3
CIV ENGR/ G L E 330	Soil Mechanics	3
CIV ENGR 340	Structural Analysis I	3
CIV ENGR 370	Transportation Engineering	3
CIV ENGR 392	Building Information Modeling (BIM)	3
E P 272	Engineering Problem Solving Using Maple	1
E P D 660	Core Competencies of Sustainability	3
INTEREGR 301	Engineering and Biology: Technological Symbiosis	1-4
ISY E 315	Production Planning and Control	3
ISY E 323	Operations Research-Deterministic Modeling	3
ISY E/PSYCH 349	Introduction to Human Factors	3
INFO SYS 371	Technology of Computer-Based Business Systems	3
MATH 321	Applied Mathematical Analysis	3
MATH 322	Applied Mathematical Analysis	3
M E 273	Engineering Problem Solving with EES	1
M S & E 330	Thermodynamics of Materials	4
M S & E 332	Macroprocessing of Materials	3
M S & E 352	Materials Science-Transformation of Solids	3
N E 305	Fundamentals of Nuclear Engineering	3
PHYSICS 205	Modern Physics for Engineers	3
PHYSICS 241	Introduction to Modern Physics	3
PHYSICS 311	Mechanics	3
PHYSICS 321	Electric Circuits and Electronics	4
PHYSICS 322	Electromagnetic Fields	3
PHYSICS 325	Optics	4
STAT 311	Introduction to Theory and Methods of Mathematical Statistics I	3
STAT 312	Introduction to Theory and Methods of Mathematical Statistics II	3
STAT 333	Applied Regression Analysis	3
STAT 349	Introduction to Time Series	3
STAT 351	Introductory Nonparametric Statistics	3

Up to 3 technical elective credits may be obtained for non-formal courses such as independent study courses (M E 489, M E 491, M E 492, and other engineering independent study courses numbered 399 and higher); Cooperative Education (M E 1); and E P D 690, "Wisconsin Engineer Magazine."

MATH/SCIENCE ELECTIVES

Code	Title	Credits
The mechanical engineering curriculum requires 3 credits of math/science electives. CHEM 104 or CHEM 109, any formal course listed as a biological science and numbered 100 or higher, any non-engineering formal course listed with physical or natural science breadth and numbered 200 or higher will satisfy this requirement. If the math/science auxiliary credit condition is met with additional coursework, the math/science elective requirement may be met with a formal course offered by an engineering department numbered 200 and above (except INTEREGR and E P D).		
Total Credits		3

COMMUNICATION SKILLS

Code	Title	Credits
ENGL 100	Introduction to College Composition	3
or LSC 100	Science and Storytelling	
or COM ARTS 100	Introduction to Speech Composition	
or ESL 118	Academic Writing II	
INTEREGR 397	Engineering Communication	3
Total Credits		6

LIBERAL ELECTIVES

Code	Title	Credits
The Mechanical Engineering curriculum requires 15 credits of liberal elective courses. See College of Engineering Liberal Studies Requirements for details.		
Complete Requirements (http://guide.wisc.edu/undergraduate/engineering/#requirements)		15
Total Credits		15

ADDITIONAL INFORMATION

Students fulfilling all course requirements with fewer than 128 credits must comply with the credit minimum by taking additional free elective credits. Students must meet the math/science auxiliary credit condition with a minimum of 30 credits. Students in good academic standing may take free elective courses pass/fail (see the College of Engineering Official Regulations (<http://guide.wisc.edu/undergraduate/engineering/#policiesandregulationstext>) for details). Pass/fail courses do not count toward specific degree requirements.

Independent Studies and projects courses:

Code	Title	Credits
M E 291	Undergraduate Mechanical Engineering Projects	1-3
M E 299	Independent Study	1-3
M E 489	Honors in Research	1-3

M E 491	Mechanical Engineering Projects I	1-3
M E 492	Mechanical Engineering Projects II	1-3

Students must have a cumulative 2.5 GPA or a 3.0 GPA for their previous two semesters and have written permission to enroll from their research advisor.

For information on credit loads, adding or dropping courses, course substitutions, pass/fail, auditing courses, dean's honor list, repeating courses, probation, and graduation, see the College of Engineering Official Regulations (<http://guide.wisc.edu/undergraduate/engineering/#policiesandregulationstext>).

HONORS IN RESEARCH PROGRAM

The ME Department's Undergraduate Honors in Research Program allows students to participate in the creation of new knowledge and experience the excitement of the research process. Students in the program write and submit a senior thesis. Admission requirements include:

- At least two semesters completed on the Madison campus with a cumulative GPA of at least 3.5;
- Majoring in Mechanical Engineering;
- Approval of an appropriate professor who will serve as the thesis advisor.

The "Honors in Research" designation will be awarded to graduates who meet the following requirements:

- Satisfaction of the requirements for an undergraduate degree in Mechanical Engineering;
- A cumulative GPA of at least 3.3;
- Completion of a total of at least 6 credits of M E 489 Honors in Research;
- Receive a final grade of at least "B" in M E 489;
- Completion of senior thesis.

Students must certify completion of the program with their M E 489 advisor the term they intend to graduate. To certify program completion students must complete the appropriate form and submit to student services.

UNIVERSITY DEGREE REQUIREMENTS

Total Degree To receive a bachelor's degree from UW-Madison, students must earn a minimum of 120 degree credits. The requirements for some programs may exceed 120 degree credits. Students should consult with their college or department advisor for information on specific credit requirements.

Residency Degree candidates are required to earn a minimum of 30 credits in residence at UW-Madison. "In residence" means on the UW-Madison campus with an undergraduate degree classification. "In residence" credit also includes UW-Madison courses offered in distance or online formats and credits earned in UW-Madison Study Abroad/Study Away programs.

Quality of Work Undergraduate students must maintain the minimum grade point average specified by the school, college, or academic program to remain in good academic standing. Students whose academic performance drops below these minimum thresholds will be placed on academic probation.