



# Mechanical Engineering

Advising Guide  
2011-2012

The characteristics which perhaps best define mechanical engineering are breadth and flexibility. Mechanical engineering is a core discipline which encompasses the general areas of design and manufacturing, fluid and solid mechanics, and thermal and materials science. Many career directions are open to mechanical engineers. They work in industry, government, and universities as well as in other professions including business, law, and medicine.

Mechanical engineers are employed in a wide range of industries, including automotive, aerospace, biomechanical, biomedical, chemical, computer, electronic, energy, environmental, industrial machinery, medical instrumentation, manufacturing, mining, oceanographic, petroleum, pharmaceutical, power, printing, publishing, and textile. Mechanical engineers typically engage in one or more of the following: research, development, design, testing, manufacturing, operation and maintenance, marketing and sales, and administration.

The Department of Mechanical Engineering at the University of Colorado at Boulder has approximately 500 undergraduate and 160 graduate students. Currently there are 28 full-time research faculty, 4 instructors, 15 postdoctoral research fellows, and 5 adjunct faculty. The undergraduate curriculum incorporates mathematics, physical science, engineering science, design and manufacturing, systems engineering, and the humanities and social sciences. Courses in these areas are interwoven throughout the curriculum to provide a balanced education in the fundamentals of the profession. Senior design projects are typically sponsored by local and national industry, providing hands-on, relevant design experiences.

To meet the needs of students with varied professional objectives, the department offers two technical elective plans for the Bachelor of Science degree in Mechanical Engineering. The first augments the required course curriculum with electives designed to provide a broad, general undergraduate education. The second is designed for the student with more specific career plans, facilitating in-depth study in a specific technical area such as biomedical engineering or environmental engineering. Students have excellent opportunities to become involved in discipline-related activities outside of the classroom. The department has active chapters in a number of major student societies including the American Society for Mechanical Engineering (ASME), Society of Manufacturing Engineers (SME), and Pi Tau Sigma, the ME honor society.

Undergraduates can participate in ongoing research through independent study projects, the Undergraduate Research Opportunities Program (UROP), and as research assistants in sponsored projects. Undergraduate research may involve participation in one of the Mechanical Engineering Department research centers, including the Center for Combustion & Environmental Research; DARPA Focus Center on Nanoscale Science & Technology; NSF Membrane & Applied Science Center; Nanomaterials Characterization Facility; and the Collaborative for Air Quality Research. Interested students should contact faculty members directly.

The Durning Lab is a multi-use facility used primarily by seniors to reinforce classroom concepts in a hands-on laboratory environment. It contains various experiments that explore concepts in pressure, combustion, thermodynamics and materials science. In addition, it houses a fully equipped machine shop for fabricating design projects, such as the annual Shell Eco-Marathon Car.

Students transferring from another university meet with the departmental transfer credit evaluator, who evaluates previous courses for their applicability to the Mechanical Engineering Department's curriculum.

Additional information on the Mechanical Engineering program may be obtained from the undergraduate advisor:

Department of Mechanical Engineering  
Campus Box 427  
Boulder, CO 80309-0427

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web: <http://www.colorado.edu/mechanical/>  
email: [molly.conroy@colorado.edu](mailto:molly.conroy@colorado.edu)

**SAMPLE CURRICULUM FOR THE B.S. DEGREE IN MECHANICAL ENGINEERING**  
(128 semester credit hours required)

<b>FRESHMAN YEAR</b>		<b>Credits</b>			<b>Credits</b>
<b>Fall Semester</b>		16	<b>Spring Semester</b>		17
MCEN 1025 Computer-Aided Design	3	APPM 1360 Calculus for Engineers 2	4	PHYS 1110 General Physics 1	4
APPM 1350 Calculus for Engineers 1	4	GEEN 1300 Intro to Engr Computing	3	GEEN 1400 Engineering Projects	3
CHEN 1211 General Chemistry for Eng	3	Humanities/Social Science Elective*	3		
CHEM 1221 General Chemistry Lab	2				
MCEN 1000 Intro to Mechanical Eng	1				
Humanities/Social Science Elective*	3				

<b>SOPHOMORE YEAR</b>		<b>Credits</b>			<b>Credits</b>
<b>Fall Semester</b>		18	<b>Spring Semester</b>		16
MCEN 2023 Statics and Structures	3	MCEN 2063 Mechanics of Solids	3	PHYS 2130 General Physics 3	3
APPM 2350 Calculus for Engineers 3	4	APPM 2360 Diff Eqns with Linear Algebra	4	MCEN 2043 Dynamics	3
PHYS 1120 General Physics 2	4	Humanities/Social Science Elective*	3		
PHYS 1140 Experimental Physics	1				
MCEN 2024 Materials Science	3				
Free Elective	3				

<b>JUNIOR YEAR</b>		<b>Credits</b>			<b>Credits</b>
<b>Fall Semester</b>		15	<b>Spring Semester</b>		17
MCEN 3012 Thermodynamics	3	MCEN 3022 Heat Transfer	3	MCEN 3025 Component Design	3
MCEN 3021 Fluid Mechanics	3	MCEN 3037 Exp. Design and Data Analysis	2	MCEN 3032 Thermodynamics 2	3
MCEN 3030 Computational Methods	3	Humanities/Social Science Elective*	3		
ECEN 3010 Circuits & Electronics	3				
WRTG 3030 Writing on Science & Society	3				

<b>SENIOR YEAR</b>		<b>Credits</b>			<b>Credits</b>
<b>Fall Semester</b>		17	<b>Spring Semester</b>		15
MCEN 4026 Mfg Processes and Systems	3	MCEN 4047 Mechanical Eng Lab.	2	MCEN 4085 ME Design Project II	4
MCEN 4037 Measurements Lab	2	MCEN Technical Elective	3	General Technical Elective	3
MCEN 4043 System Dynamics	3	General Technical Elective	3		
MCEN 4045 ME Design Project I	3	General Technical Elective	3		
MCEN Technical Elective	3				
Humanities/Social Science Elective*	3				

\*When selecting HSS electives, students should consult the College's Humanities and Social Sciences Info Center (<http://engineering.colorado.edu/homer>). Engineering students are encouraged to explore offerings made available through the Herbst Program of Humanities for Engineers before deciding upon their HSS courses.