

MECHANICAL ENGINEERING, BS

Introduction

Please click here (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-engineering-design-computing/mechanical-engineering/>) to see the Mechanical Engineering department information.

The mechanical engineer is concerned with satisfying the needs of society using a combination of material, human, and economic resources. Mechanical engineering covers a wide spectrum of activities in the engineering profession. Generally, it uses design, analysis, and experimentation of mechanical systems to ensure safe, efficient, and productive operation. These activities include energy conversion and transmission and associated power processes; dynamic, strength, and wear considerations. In addition, economic aspects of the development, design, and use of materials, machines, and processes are investigated. Furthermore, the analysis, synthesis, and control of entire engineering systems are topics that mechanical engineers address.

Program Educational Objectives.

The program offered by the Department of Mechanical Engineering of the University of Colorado Denver can predominately be completed in the afternoon and evening hours to accommodate both working and traditional students. The department seeks to graduate a diverse population of students with bachelor's degrees who within a few years of graduation able to:

1. Be employed by a diverse group of industries, research laboratories, and educational institutions.
2. Pursue careers in engineering, interdisciplinary areas, research, and education.
3. Pursue postgraduate education and advanced degrees.

The mechanical engineering curriculum begins with a strong emphasis on mathematics and physics. It continues with a concentration in engineering sciences, including solid and fluid mechanics; thermodynamics, heat, and mass transport; materials; and systems analysis and control. It also incorporates laboratory and design courses that demonstrate how scientific knowledge is applied in the design and development of valuable devices and manufacturing processes.

The mechanical engineering program has a two-course senior-year capstone design sequence where students design and build, either virtually or physically, a project requiring many of the techniques learned in the program. In the last two years, the curriculum emphasizes engineering science and design and provides technical electives in the following areas:

- thermodynamics
- heat transfer
- fluid mechanics
- solid mechanics
- biomechanics
- dynamics and controls
- computer-aided design and manufacturing
- composite materials

- outdoor recreational gear
- additive manufacturing
- material science
- computational solid and fluid mechanics
- design engineering and science

Program Delivery

- This is an on-campus program.

Declaring This Major

- Click here (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-engineering-design-computing/#policiestext>) to go to information about declaring a major.

General Requirements

To earn a degree, students must satisfy all requirements in each of the areas below, in addition to their individual major requirements.

- CU Denver General Graduation Requirements (<http://catalog.ucdenver.edu/cu-denver/undergraduate/graduation/>)
- CU Denver Core Curriculum (<http://catalog.ucdenver.edu/cu-denver/undergraduate/graduation-undergraduate-core-requirements/>)
- College of Engineering, Design and Computing Graduation Requirements (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-engineering-design-computing/#graduationrequirements>)
- Click here (<http://catalog.ucdenver.edu/cu-denver/undergraduate/academic-policies-procedures/>) for information about Academic Policies

Program Requirements

1. CVEN 3111 Analytical Mechanics II may be substituted for MECH 2033 Dynamics.
2. Not all courses may be offered every semester.
3. Students must maintain a minimum 2.0 GPA in all courses applying to major requirements.
4. Students must maintain a minimum 2.0 GPA in all MECH courses attempted.
5. Students must complete a minimum of 128 semester hours of coursework.
6. The last 30 hours must be earned as a degree-seeking student in the College of Engineering Design and Computing at CU Denver.

Code	Title	Hours
Required Courses		
MECH 1025	CAD and Graphics for Mechanical Engineering	3
MECH 1045	Manufacturing Processes Design	3
MECH 1100	Fundamentals of Computational Innovation	3
MECH 1200	Fundamentals of Engineering Design Innovation	3
MECH 2023	Statics	3
MECH 2033	Dynamics	3
	or CVEN 3111 Analytical Mechanics II	
ELEC 3030	Electric Circuits and Systems	3
MECH 2024	Introduction to Materials Science	3
MECH 2034	Properties of Engineering Materials	1

MECH 3010	Elementary Numerical Methods and Programming	3
MECH 3012	Thermodynamics	3
MECH 3021	Introduction to Fluid Mechanics	3
MECH 3027	Measurements	3
MECH 3028	Laboratory of Mechanical Measurements	1
MECH 3031	Fluids/Thermal Laboratory	1
MECH 3032	Electric Circuits and Systems Lab	1
MECH 3035	Design of Mechanical Elements	3
MECH 3042	Heat Transfer	3
MECH 3043	Strength of Materials	3
MECH 4023	System Dynamics	3
MECH 4035	Senior Design I	3
MECH 4045	Senior Design II	3
MECH 4142	Thermal Energy Systems	3

Technical Electives

Select 12 semester hours of the following: 9

MECH 4208/5208	Special Topics	
MECH 3045	Principles of Additive Manufacturing	
MECH 3939/5939	Internship	
MECH 4020/5020	Biomechanics	
MECH 4025/5025	Advanced Biomechanics	
MECH 4110	Numerical Methods for Engineers	
MECH 4114	Designing with Composites	
MECH 4116	Robotics	
MECH 4120	Methods of Engineering Analysis	
MECH 4141	Fluid Mechanics	
MECH 4147	Engineering Economy	
MECH 4163	Rigid-Body Dynamics	
MECH 4175	Finite Element Analysis in Machine Design	
MECH 4178	Solar Engineering	
MECH 4228/5228	Special Topics (Special Topics) ²	

Mathematics

MATH 1401	Calculus I	4
MATH 2411	Calculus II	4
MATH 2421	Calculus III	4
MATH 3195	Linear Algebra and Differential Equations	4

Science

ENGR 1130	Chemistry for Engineers	5
PHYS 2311	General Physics I: Calculus-Based	4
PHYS 2321	Intro Experimental Phys Lab I	1
PHYS 2331	General Physics II: Calculus-Based	4
PHYS 2341	Intro Experimental Phys Lab II	1

Total Hours 101

Instrumentation, LA Green Roof, Introduction to Aerodynamics, Polymer Viscoelasticity, Liquid Crystal Materials, Computational Design, Wind Energy.
² Mobile Robotics, Road Vehicle Dynamics, Linear Optimal Control, Intermediate Vibrations, Linear Systems & Control. Autonomous Vehicle Design, Renewable Energy.

To review the Degree Map for this program, please visit our website (<https://www.ucdenver.edu/student/advising/undergraduate/degree-maps/cedc/>).

¹ Intro to Comp Fluid Dynamics, Buckling & Stability, Prototyping, Thermal Systems Design, Cellular Bioengineering, Cellular Biomechanics, Advanced Biomechanics, Low Speed Aerodynamics, Feedback and Optimal Control, Tribology, Intermediate Controls, Intermediate Vibrations, IC Engines, Experimental Mechanics, Vehicle