

# 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. These activities include the conversion and transmission of energy and associated power processes; the kinematic, dynamic, strength, and wear considerations, as well as economic aspects of the development, design, and use of materials, machines, and processes; and the analysis, synthesis, and control of entire engineering systems.

The program offered by the Department of Mechanical Engineering of the University of Colorado Denver can 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 are 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, physics, and chemistry. 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 concludes with laboratory and design courses that demonstrate the ways in which scientific knowledge is applied in the design and development of valuable devices and manufacturing processes.

The mechanical engineering program may be roughly subdivided into two-year groupings. In the first two years, the program emphasizes the fundamentals of mathematics and basic science that are essential for an understanding of most branches of engineering. In the last two years of the program, the curriculum emphasizes engineering science and design and provides technical electives in the following areas:

- thermodynamics
- heat transfer
- fluid mechanics
- solid mechanics
- motorsports engineering
- bioengineering
- dynamics and controls
- computer-aided design and manufacturing
- composite materials
- 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 2121 Analytical Mechanics I and CVEN 3111 Analytical Mechanics II may be substituted for MECH 2023 Statics and MECH 2033 Dynamics respectively.
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 course work.
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
<b>Required Courses</b>		
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 or CVEN 2121	Statics Analytical Mechanics I	3
MECH 2033 or CVEN 3111	Dynamics Analytical Mechanics II	3
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 3022	Thermodynamics II	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 II: Controls	3
MECH 4035	Senior Design I	3
MECH 4045	Senior Design II	3
MECH 4142	Thermal Systems Design	3

**Technical Electives**

Select 9 semester hours of the following: 9

MECH 2208/4208/520	Special Topics: 2208-2298 <sup>1</sup>	
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 4176	Introduction to Sports Engineering	
MECH 4177	Energy Conversion	
MECH 4178	Solar Engineering	
MECH 4228/5228	Special Topics (Special Topics)	

**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** 104

Intermediate Controls, Road Vehicle Dynamics, IC Engines, Linear Optimal Control, Experimental Mechanics, Vehicle Instrumentation, LA Green Roof, Introduction to Aerodynamics, Vehicle Design, Polymer Viscoelasticity, Robotics

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

<sup>1</sup> Intro to Comp Fluid Dynamics, Buckling & Stability, Prototyping, Low Speed Aerodynamics, Feedback and Optimal Control, Tribology,