

# MAJOR IN MECHANICAL ENGINEERING

Is making a difference important to you? Do you like putting ideas and designs to work? Are you interested in collaborating and working in teams with others? Would you enjoy the challenge of inventing sustainable energy devices, leading computer-aided product design, or biomedical research? Does creating new designs for the hybrid electric vehicle industry, or new airplanes in the fields of aeronautics and aerospace sound interesting? Would designing or doing research and development in a wide range of industrial and governmental enterprises appeal to you? Does studying thermal sciences and the integration of electronic and mechanical devices interest you? If your answer to any of these questions is "yes," then a major in Mechanical Engineering may be for you.

Mechanical engineers are creative problem solvers who design, develop, and manufacture the machines and instrumentation that run energy, building, environmental, and transportation systems. Examples include biomedical devices, ground/air/space vehicles, robots, environmental control equipment, and power plants.

In Mechanical Engineering, students take basic science and mathematics courses while beginning their engineering studies in design and computing. A broad spectrum of classes is designed to sharpen problem-solving skills. The senior year focuses on a year-long capstone design course to help students in the transition from college to an engineering career. Students also choose technical electives from the energy, automotive, material science, manufacturing, dynamic systems, robotics and controls, simulation and modeling, and biomedical engineering areas. Participation in labs provides an active learning environment and further develops design, modeling, and analytical skills.

Mechanical Engineering at CSU is dedicated to graduating ethical mechanical engineers who:

- Make an impact on society's global, grand engineering challenges.
- Act as innovative and creative engineering designers who identify, analyze, and solve complex problems.
- Function as accomplished thinkers with hands-on practical skills.
- Serve as local, regional, and global collaborators and communicators.
- Commit to life-long learning.
- Uphold the CSU Principles of Community which encompass inclusion, integrity, respect, service, and social justice.

## Learning Objectives

Mechanical Engineering Bachelor of Science graduates will be able to accomplish the following within the first few years after graduation:

1. Identify, analyze, formulate, and solve complex engineering problems associated with their professional position, both independently and in a team environment.
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

4. Manage multi-faceted and multi-disciplinary projects with significant legal, ethical, regulatory, social, environmental, and economic considerations using a broad systems perspective.
5. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
6. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
7. Communicate effectively with colleagues, professional clients, and the public.
8. Demonstrate commitment and progress in lifelong learning, professional development, and leadership.

## Potential Occupations

Graduates from the Department of Mechanical Engineering are expected to have the fundamental knowledge required for the successful practice of mechanical engineering. CSU engineering graduates are well prepared for a professional career. The Department boasts a 100% pass rate on the Fundamentals of Engineering professional examination. Participating in internships, co-curricular and volunteer activities, and cooperative education opportunities is highly recommended to enhance practical training and development. Students who continue on to pursue a graduate education can attain more responsible positions with the possibility of rising to top professional levels.

## Concentrations

- Advanced Manufacturing Concentration (<http://catalog.colostate.edu/general-catalog/colleges/engineering/mechanical/mechanical-engineering-major-advanced-manufacturing-concentration/>)
- Aerospace Engineering Concentration (<http://catalog.colostate.edu/general-catalog/colleges/engineering/mechanical/mechanical-engineering-major-aerospace-engineering-concentration/>)