

Mechanical Engineering

Mechanical engineering examines the generation, distribution, and use of energy by applying principles of physics and materials science to the design, manufacturing, analysis, and maintenance of mechanical systems. Mechanical engineering is a multifaceted discipline, drawing upon the areas of design and manufacturing, fluid and solid mechanics, and thermal and materials science. Mechanical engineers are characteristically known for their broad range of knowledge, skills, and flexibility. These engineers have a wide variety of employment opportunities in a multitude of industries. Specific technical areas include aerospace, energy, environmental, and biomedical engineering, as well as micro and nano-technology, design, and manufacturing, fluid mechanics, materials science, solid mechanics, and thermal science. CMU also has many [clubs and organizations](#) that can help prepare students for advanced study in their field or build campus and community connections.



Organizations That Commonly Employ Mechanical Engineering Majors

- Aerospace companies
- Aviation companies
- Automotive companies
- Biomedical companies
- Computer and electronic industries
- Engineering firms
- Government agencies
- Industrial machinery companies
- Industrial manufacturing companies
- Mining companies
- Oceanographic industry
- Petroleum industry
- Power and energy industries
- Printing and publishing industries
- Universities

Major Skills & Characteristics

- Ability to perform complex numerical computations
- Analytical reading
- Critical thinking
- Data Interpretation
- Directing/organizing activities and staff
- Equipment operation/manipulation
- Flexibility
- High computer literacy
- Oral & written communication
- Problem solving
- Scientific skills
- Sound decision-making
- Strong spatial reasoning

A person in this career field may:

- Apply complex formulas and scientific principles.
- Design, fabricate, and/or assemble new or modified mechanical components for products such as industrial machinery or equipment.
- Operate drill press, grinders, engine lathe, or other machines to fabricate mechanical parts.
- Operate and calibrate computer systems and devices to fabricate parts, perform test or analysis, and/or perform mechanical processes.
- Read dials and meters to determine amperage, voltage, electrical output and input to create, test, analyze, and/or operate mechanical devices.
- Read, evaluate, and or create drawings and specifications of mechanical devices.

Mechanical Engineering at Colorado Mesa University

The CMU Mechanical Engineering programs prepare students for careers in a wide range of industries through the rigorous study of mechanical engineering. Students gain a relevant, hands-on design experience beginning in their first year and work alongside faculty to analyze and solve problems related to health, environment, energy, transportation, and communications. Students also have excellent opportunities to become involved in discipline-related activities beyond the classroom. Colorado Mesa offers 3 different engineering programs enabling students to enter the engineering field at different technical, managerial, and design levels.

Mechanical Engineering CU Partnership Program

- The [Mechanical Engineering Partnership Program](#) offered at the Colorado Mesa University campus in Grand Junction, Colorado allows students to pursue a mechanical engineering degree on the Western slope. Students in this program are taught by CMU faculty for the first two years of the program and by CU faculty for the final two years of the program.
- This program prepares students to become professional engineers or to go on to graduate school. ME's are typically the innovators, the engineers who design, develop, and research.

Mechanical Engineering Technology Programs

CMU also offers an Associate of Applied Science and a Bachelor of Science in Mechanical Engineering Technology (MET).

AAS Mechanical Technology Degree

- The [AAS MET](#) program is designed for a student to complete in two-years and is focused on experiential skills of a mechanical engineer. The graduate attains basic proficiency in basic manufacturing methods, computer aided design (CAD), and basic computer numerical control (CNC). Engineering statics and structures along with fundamental physics and chemistry are emphasized. College level pre-calculus, differential and integral calculus are the mathematical requirements. Some general education and basic technical communications is attained.
- An employee in industry with this degree would be classified as an engineering technician in most companies and primarily be responsible for the operation, maintenance, and/or trouble shooting of machinery with little managerial or budget responsibility. This person would be devoted to providing technical solutions usually not of a complex planning or computational nature.

BS Mechanical Technology Degree

- The [BS MET](#) program provides students with a more advanced engineering skill set than the AAS. Students receive instruction on materials, machine design, fluid mechanics, circuits, thermodynamics, and heat transfer. Proficiency in industrial controls and automation along with advanced manufacturing methods in inventory control, quality improvement, along with lean and optimization concepts are attained. Computer simulation to improve the production process is emphasized. Additional general education and mathematics through statistical methods is required.
- An employee in industry with this degree would typically be classified as an engineer. They would be tasked with challenges of a more computational nature and be required to perform more extensive planning. They would be responsible for the layout and operation of manufacturing processes, be involved in material selection and manufacturing techniques that would maximize the efficiency of bringing a product to market. Some design and analysis work would be required. Many companies would have these graduates take the role of project manager or shop floor manager. This employee would often be charged with managing workers, technicians, and/or the budget. Certification as a professional engineer with this degree is possible in some states.

Related Careers

- Aerospace Engineer/Technician
- Business Process Reengineering Team Leader
- CAD/CAM Systems Administrator
- Computer Operations Manager
- Consulting Industrial Engineer
- Distribution Manager
- Flight Test Engineer/Technician
- Manager of Operations
- Manager of Systems Engineering
- Material Handling Engineer
- Methods and Measurement Engineer
- MRP Manager
- Operations Research Engineer
- Plant Engineer
- Process Control Manager
- Product Review Engineer/Technician
- Project Engineer
- Project Manager
- Quality Systems Manager
- Shop Manager
- Simulation Engineering Manager
- Simulation Specialist
- Standards Engineer
- Structural and Payload Design Engineer
- Systems Designer
- Systems Director
- Systems Engineer
- Systems Integrator
- Test Engineer
- Time Study Engineer
- Total Quality Manager

Note: *Some of the occupations listed above may require additional education, experience, or training beyond a Bachelor's Degree. To research these occupations, use the Career Research Resources links below.*

Career Research Resources:

Use these sites to research information about specific occupations such as nature of the work, training or qualifications, employment or job outlook, projections, earnings and wages.

Occupational Outlook Handbook: <http://www.bls.gov/oco/ooi/index.htm>

The Bureau of Labor Statistics

- Use the A-Z index to research occupations.
- **View OOH information on Mechanical Engineers:** <http://www.bls.gov/ooi/architecture-and-engineering/mechanical-engineers.htm>
- **View OOH information on Mechanical Engineering Technicians:** <http://www.bls.gov/ooi/architecture-and-engineering/mechanical-engineering-technicians.htm>

O*NET-Online: <http://www.onetonline.org>

The U.S. Department of Labor

- In the occupational search box type in key words, job titles, or occupational codes to research various careers.

My Future.com: <http://www.myfuture.com>

The Department of Defense

- This site compiles information from departments of [Commerce](#), [Education](#) and [Labor](#).

Organizations and Associations Links

- National Council of Examiners for Engineering and Surveying: <http://www.ncees.org>
- American Society of Mechanical Engineers: <http://www.asme.org>
- American Institute of Aeronautics and Astronautics: <http://www.aiaa.org>
- American Society of Agricultural and Biological Engineers : <http://www.asabe.org>
- Biomedical Engineering Society: <http://www.bmes.org>
- Engineers Without Borders: <http://www.ewb-usa.org>
- National Society of Black Engineers: <http://www.nsbe.org>
- National Society of Professional Engineers: <http://www.nspe.org/Students/index.html>
- Society of Women Engineers: <http://societyofwomenengineers.swe.org>
- Theta Tau Professional Engineering Fraternity: <http://www.thetatau.org>

Job Listings/Job Search Sites:

- EngineerJobs.com: <http://www.engineerjobs.com/jobs/mechanical-engineering>
- Engineer.net: <http://www.engineer.net/mechanical.php>
- Glassdoor.com: http://www.glassdoor.com/Job/mechanical-engineer-jobs-SRCH_KO0,19.htm
- Indeed.com: <http://www.indeed.com/q-Mechanical-Engineer-jobs.html>
- MechanicalEngineering.com: <http://www.mechanicalengineer.com>
- Simplyhired.com: <http://jobs.mechanicalengineering.net/a/jobs/find-jobs>