

Mechanical Engineers

SOC: 17-2141 • Career Profile Report

■ Key Facts

\$102,320

Median Salary

293,100

Employment

+9.0%

Growth Rate

■ Requirements & Salary Range

Education: Bachelor's degree

■ Automation Risk Assessment

Low Risk - 17.0% probability of being automated in the next 10-20 years.

This job is relatively safe from automation due to its creative, social, or complex problem-solving requirements.

■■ Work-Life Balance

8.1/10 - Excellent work-life balance

■ Personality Fit (RIASEC)

Higher scores indicate better personality fit for this career type.

Realistic	8.2/10	Investigative	8.8/10
Artistic	6.4/10	Social	5.2/10
Enterprising	5.8/10	Conventional	6.6/10

■ Top Skills Required

Creativity, Listening skills, Math skills, Mechanical skills, Problem-solving skills

✓ Strengths

- High Demand
- Flexible Work
- Continuous Learning

■ Challenges

- Burnout Risk
- Rapid Technological Change

■ What They Do

Mechanical Engineers apply principles of engineering, physics, and materials science to **design, analyze, and manufacture mechanical systems and devices**. They develop machines, tools, engines, and other mechanical equipment to meet performance, safety, and efficiency standards. Their work is critical in manufacturing, aerospace, energy, and technology industries.

This career is well suited for individuals who enjoy problem-solving, design, and technical innovation.

What Do Mechanical Engineers Do?

These professionals design, test, and improve mechanical devices and systems for various applications.

Common responsibilities include:

- Designing mechanical systems, components, and products using CAD and engineering principles
- Conducting analysis and simulations to ensure performance and safety
- Testing prototypes and evaluating materials and mechanisms
- Collaborating with engineers, designers, and technicians
- Troubleshooting mechanical problems and providing solutions
- Preparing technical reports, documentation, and specifications
- Ensuring compliance with engineering standards, codes, and regulations

Key Areas of Mechanical Engineering

Mechanical engineers may specialize in specific systems or industries:

- Design and Product Development: Creating new mechanical devices and improving existing ones
- Thermal and Fluid Systems: Designing heating, cooling, and fluid transport systems
- Manufacturing and Production: Overseeing the fabrication and assembly of mechanical components
- Automation and Robotics: Developing machines and systems for industrial automation
- Energy and Power Systems: Designing engines, turbines, and energy conversion systems

Skills and Abilities Needed

Mechanical engineers combine technical knowledge with analytical and creative problem-solving skills.

Core Professional Skills

Personal Qualities That Matter

Education and Career Pathway

This role typically requires formal education and technical training:

- Bachelor's Degree: Mechanical engineering or related field
- Internships or Co-op Experience: Gaining practical experience in design, manufacturing, or research
- Professional Engineer (PE) License (optional for advancement): Certification for higher responsibility roles
- Continuous Learning: Staying updated on new technologies, materials, and engineering methods
- Graduate Education (optional): Master's or PhD for specialized fields or research

Where Do Mechanical Engineers Work?

They are employed in industries that design, produce, or maintain mechanical systems:

- Manufacturing and Industrial Companies
- Aerospace and Automotive Firms
- Energy and Power Generation Companies
- Engineering and Design Consulting Firms

- Research Laboratories and Educational Institutions

Work environments include offices, laboratories, manufacturing floors, and field sites.

Is This Career Difficult?

This career requires strong analytical, design, and problem-solving skills. Engineers must ensure that mechanical systems are safe, efficient, and reliable while meeting technical and regulatory standards.

Who Should Consider This Career?

This career may be a strong fit if you:

- Enjoy designing, analyzing, and improving mechanical systems
- Are detail-oriented and technically proficient
- Can solve complex problems and innovate
- Work well in teams and communicate technical ideas effectively
- Want a career in engineering, manufacturing, or technology development

How to Prepare Early

- Take courses in physics, mathematics, and engineering fundamentals
- Participate in science, technology, engineering, and robotics projects
- Gain experience through internships, co-op programs, or technical workshops
- Develop skills in CAD, modeling, and problem-solving
- Stay informed on emerging technologies, materials, and industry practices

Mechanical engineers design, analyze, and improve mechanical systems, applying technical expertise to create safe, efficient, and innovative solutions across industries.

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Source: <https://www.bls.gov/ooh/architecture-and-engineering/mechanical-engineers.htm>