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Minnesota State University
Mankato

MECHANICAL ENGINEERING *College of Science, Engineering & Technology*

WHAT IS MECHANICAL ENGINEERING?

ASME describes mechanical engineers as those who create and develop mechanical systems for all of humankind. Concerned with the principles of force, energy and motion, mechanical engineers use their knowledge of design, manufacture, and operational processes to advance the world around us – enhancing safety, economic vitality and enjoyment throughout the world.

Not only do mechanical engineers help design everything from athletic equipment, medical devices and personal computers to air conditioners, automobile engines and electric power plants, they also design the machines that produce these innovations. Virtually every aspect of life is touched by mechanical engineering. Spanning multiple industries, the career opportunities for mechanical engineers are diverse and found worldwide throughout thousands of companies ranging from large multinational to small local firms. (Source: www.asme.org)

SHOULD YOU BE A MECHANICAL ENGINEER?

Are you passionate about solving problems? Are you ready to challenge your analytical and communication skills? Are you ready to turn your creative ideas into reality? Whether you are ready to challenge the problems of the world or make that new commercial product you should investigate the field of mechanical engineering.

CAREER OPPORTUNITIES

Mechanical engineering is one of the broadest of the engineering disciplines and mechanical engineers are employed by almost every industry. Wherever they work, they will be involved in the research, development, management, design, construction, testing, production, operation, maintenance, and sales of their industry's products and services.

Examples of industries that need mechanical engineering expertise include: aerospace, agricultural equipment, automotive, bio-technology, electronics and computers, energy, HVAC and refrigeration, industrial machinery, mining, nano-technology, petroleum, and robotics. According to the Bureau of Labor Statistics, the median salary for mechanical engineers was $90,160 in 2020. Employment of mechanical engineers is expected to grow at the same pace as other occupations increasing by 4 percent from 2019 to 2029.

Mechanical engineering students at Minnesota State Mankato receive a broad-based education that allows them to be flexible with changes in technology and industry. They are prepared to solve real-world, applied problems. Several times a year, industrial firms and government agencies visit the Minnesota State Mankato campus to interview seniors for professional employment and current students for internships.

PREPARING FOR A CAREER IN MECHANICAL ENGINEERING

The most effective preparation begins in high school, with as many mathematics and basic science courses as possible. A high school graduate who has studied at least three and a half years of mathematics, including algebra, geometry and trigonometry, and has completed physics and chemistry will be able to avoid taking these preparatory courses at Minnesota State Mankato. The most important factors for success in mechanical engineering are curiosity about how and why things work, eagerness to experiment, and commitment to solving problems to make the world work better.

THE STUDENTS

Students within the mechanical engineering program are a diverse group. They include recent high school graduates, community college transfers, military veterans, members of Minnesota State Mankato athletic teams, and international students. There are many opportunities for engineering students to become involved with social and professional activities at Minnesota State Mankato. The student chapter of the American Society of Mechanical Engineers (ASME) is a student-run organization that provides educational and leadership advancement opportunities as well as social activities. The student chapter of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) provides professional networking and opportunities for industry interactions. Students can also get involved with ASME and ASHRAE design competitions as well as become involved with faculty directed research.

On the interdisciplinary side mechanical engineers are often active with the student chapter of Engineers Without Borders (EWB), a service organization that helps design and implement community improvement projects in underdeveloped countries. Students also participate with the Society of Automotive Engineers (SAE) design competitions managed through the Department of Automotive and Manufacturing Engineering Technology. In addition, there are chapters of other organizations such as the Society of Women Engineers (SWE), the National Society of Black Engineers (NSBE), and the Society of Hispanic Professional Engineers (SHPE).

THE PROGRAM

The mechanical engineering program at Minnesota State Mankato strives to produce sound engineering professionals with a well-balanced analytical and experimental background. Coursework includes mathematics and basic sciences, communications, including graphic design and technical writing, humanities and social sciences, engineering sciences, and engineering design. The program culminates with a two semester industry sponsored capstone design project.

The department strongly encourages all students to obtain professional registration. Seniors are required to take the Fundamentals of Engineering

Examination, which is administered nationally as the first step in professional

licensure. Ninety-five percent of the Minnesota State Mankato mechanical engineering students pass the exam on their first attempt!

The Mechanical Engineering program at Minnesota State University, Mankato is accredited by the Engineering Accreditation Commission of ABET (www.abet.org).

FACULTY & FACILITIES

The mechanical engineering program has seven full-time faculty members. All of these professors have earned the Ph.D. in engineering and some are licensed Professional Engineers. The faculty have expertise in mechanical systems, thermal fluid systems, mechatronics, and manufacturing.

The Department of Mechanical and Civil Engineering maintains numerous labs to provide a strong hands-on experience. Labs are equipped with modern equipment and software which is made available for use by undergraduate and graduate students for course, research, capstone design, and competition design. In addition, the program has access to the many manufacturing resources of the Department of Automotive and Manufacturing Engineering Technology.

FOR MORE INFORMATION PLEASE CONTACT

Department of Mechanical & Civil Engineering

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https://cset.mnsu.edu/departments/mechanical-and-civil-engineering/mechanical-engineering/

You are encouraged to visit the campus.
To arrange for a visit, please call:
Office of Admissions: 507-389-1822
Toll-Free: 800-722-0544
To arrange a visit of the mechanical engineering facilities please contact the Department directly.

SAMPLE FOUR-YEAR CURRICULUM (MECHANICAL ENGINEERING, BSME)

First Year (Fall)	First Year (Spring)
ME 101 Introduction to Mechanical Engineering (2) MATH 121 Calculus I (4) CHEM 191 Chemistry Applications (3) ENG 101 Composition (4) ECON 201 Macroeconomics (3)	ME 103 Computer Graphics Communication (1) ME 201 Introduction to Problem Solving & Design (2) EE 244 Digital Logic (2) MATH 122 Calculus II (4) PHSY 221 General Physics I (4) CMST 102 Public Speaking (3) **OR** ENGL 271W Tech Comm (4)
Second Year (Fall)	**Second Year (Spring)**
ME 212 Statics (3) EE 230 Circuits I (3) EE 240 Circuits I Laboratory (1) MATH 321 Differential Equations (4) PHYS 222 General Physics II (3) PHSY 232 General Physics II Laboratory (1)	ME 203 GD&T in Engineering Design (2) ME 214 Dynamics (3) ME 223 Mechanics of Materials (3) MATH 223 Calculus III (4) MATH/SCIENCE Required Elective (4)
Third Year (Fall)	**Third Year (Spring)**
ME 241 Thermodynamics (3) ME 291 Engineering Analysis (3) ME 306 Materials Science (3) ME 321 Fluid Mechanics (3) ME 341 Linear Systems Analysis (3)	ME 324 Heat Transfer (3) ME 329 Applied Thermodynamics (3) ME 333 Manufacturing Processes (3) ME 336 ME Experimentation I (2) ME 417 Machine Elements (3) General Education (3)
Fourth Year (Fall)	**Fourth Year (Spring)**
ME 420 Computer Aided Engineering (3) ME 428 Design Project I (3) ME 436W ME Experimentation II (2) ME 463 Automatic Controls (3) ME 492 ME Seminar (1) ME Required Elective (3) General Education (3)	ME 438W Design Project II (3) ME 466W ME Experimentation III (2) ME Required Elective (3) General Education (4) General Education (3)

For additional information about course requirements, please visit http://www.mnsu.edu/supersite/academics/bulletins/

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MINNESOTA STATE UNIVERSITY MANKATO