

Mechanical Engineering

WHAT IS MECHANICAL ENGINEERING?

Pursuing a Mechanical Engineering degree at the University of Michigan, affords you the opportunity to acquire technical knowledge applicable to a vast array of engineering disciplines, such as aerospace, biomedical, civil and environmental, engineering physics, materials science, and naval architecture and marine engineering. This versatility allows our graduates to excel in a wide range of careers and industries; some of these include research, design, development, manufacturing, and maintenance of mechanical systems and products

NEEDED SKILLS:

- Mathematical skills
- Problem solving
- Critical thinking
- Scientific reasoning
- Reading comprehension
- Communication skills**

JOB TITLES

- Design Engineer
- Automotive Engineer
- Stress Analyst
- Combustion Engineer
- Solar Engineer
- Hydraulic Engineer
- Research Engineer
- Test Inspection Engineer
- Automation Engineer
- Ventilation Engineer
- Engine Designer
- Plant Equipment Engineer
- Failure Analysis Engineer
- Machine Tool Designer**

SALARIES

\$83,590*

The nationwide average salary for employees with a bachelor's degree in Mechanical Engineering

\$65,914

UM graduates average starting salaries
Courtesy of the Engineering Career Resource Center

**Information from <http://www.bls.gov/ooh/>*

***Information from: www.myplan.com*

INDUSTRIES AND OCCUPATIONS

- Industrial machinery manufacturing
- Architectural/design services
- Aerospace industry
- Automobile industry
- Agricultural, mining, & construction industry
- Public administration/government/patent law
- Scientific research
- Business management
- Medical/Biomechanics
- Robotics**

JOB OUTLOOK

Employment of mechanical engineers is expected to grow 5% from 2012 to 2022, as fast as the average for all occupations. Job prospects may be best for those who stay informed regarding the most recent advances in technology. Mechanical engineers can work in many industries and on many types of projects. As a result, their growth rate will differ by the industries that employ them.*

MORE INFORMATION

- www.myplan.com
- stats.bls.gov/ooh
- <http://www.sae.org>
- <https://www.asme.org>
- Engineering Career Resource Center, 230 Chrysler
- ME Undergraduate Handbook:
<http://me.engin.umich.edu/academics/ugsh>
- See an ME advisor. Email me-aso@umich.edu or visit 2380 GG Brown

Mechanical Engineering

WHICH ME CLASSES SHOULD YOU START WITH?

To begin the ME major, a good option is to take MECHENG 240 and/or MECHENG 211, followed by ME 235, and ME 250. MECHENG 211 and MECHENG 240 serve as excellent introductions to the major. Also remember that ME has an Advanced Math requirement as well as one Electrical Circuits course (EECS 314 or EECS 215), and a required Economics/Financials course, which will count toward your Intellectual Breadth core requirement for engineering. Read more about the ME Department as well as the BSE degree via the Undergraduate Handbook (me.engin.umich.edu/academics/ugsh)

COURSE DESCRIPTIONS

MECHENG 211 – 4 credits

Introduction to Solid Mechanics

Prerequisites: Physics 140 and Math 116.

Statics: moment and force resultants, equilibrium. Mechanics of deformable bodies: stress/strain, classification of material behavior, generalized Hooke's law.

Engineering applications: axial loads, torsion of circular rods and tubes, bending and shear stresses in beams, deflection of beams, combined stresses, stress and strain transformation. Four lecture classes per week.

MECHENG 235 – 3 credits

Thermodynamics I

Prerequisites: Chem 130/125 or Chem 210/211 and Math 116.

Introduction to engineering thermodynamics. First law, second law, system and control volume analyses; properties and behavior of pure substances; application to thermodynamic systems operating in steady state and transient processes. Heat transfer mechanisms. Typical power producing cycles and refrigerators. Ideal gas mixtures and moist air applications.

MECHENG 240 – 4 credits

Dynamics & Vibrations

Prerequisites: Physics 140, preceded or accompanied by Math 216.

Vector description of force, position, velocity and acceleration in fixed and moving reference frames. Kinetics of particles, of assemblies of particles and of rigid bodies. Energy and momentum concepts. Euler's equations. Moment of inertia properties. The simple oscillator and its applications.

MECHENG 250 – 4 credits

Design & Manufacturing I

Prerequisites: Math 116, Engr 101 or equivalent

Basics of mechanical design: visual thinking, engineering drawing, and machine anatomy. Basics of manufacturing: processes, materials, and thermofluid aspects. Use of computers in various phases of design and manufacturing. Exposure to CAD systems and basic machine shop techniques. Design/manufacturing project. Three hours lecture and two hours laboratory.