Mechanical Engineering

The mechanical engineer is constantly challenged to use the principles of mathematics and the physical and thermal sciences to design and construct what people need and want.

Mechanical engineers are concerned with the practical purpose and function of a machine or system, as well as its design for strength, reliability, safety, economy, and appearance. A few of the systems that involve mechanical engineering include airplanes, automobiles, spacecrafts, automated assembly lines, industrial robots, refrigeration and air conditioning units, construction machinery, computer hardware, pollution control devices, and nuclear reactors.

Employment Opportunities

As a mechanical engineering graduate, you will enjoy employment opportunities in aerospace, automotive, manufacturing, public utilities, transportation, construction, hospitals, and HVAC industry. Graduates work in the traditional areas of research, design, product development, construction, production, sales, management, consulting, and teaching.

Through the Office of Career Services, mechanical engineers graduating from YSU generally have the opportunity to interview on campus with numerous prospective employers. Since 1997, the placement rate for YSU mechanical engineering graduates has approached 100%. Career growth prospects for successful mechanical engineers are also excellent as promotions to advanced technical levels or managerial positions are typical.

Degree Options

Students majoring in mechanical engineering earn the Bachelor of Engineering (BE) degree. The course of study at the undergraduate level is principally a four-year program unless the student selects the cooperative education program. Upon receipt of the baccalaureate degree, graduates are prepared for study at the Master and Doctoral levels in engineering or for employment in the aforementioned professions.

Faculty

The program retains its tradition as a small school in maintaining close contact between its students and faculty. The mechanical program is staffed by teaching professionals, all of whom have a doctoral degree, with most having a professional engineer’s license. Senior professors serve as academic advisors and are involved in all phases of instruction from freshman to graduate courses.

The faculty strives to keep abreast of developments in their specialty areas through continuous study and research, as well as through consulting and other interaction with industry and society. The mechanical engineering faculty is very active in research in the STEM College.

Youngstown State University maintains a faculty-student ratio of 1:20, among the best of state-affiliated universities in Ohio.

Accreditation

The mechanical engineering program of the College of Science, Technology, Engineering and Mathematics (STEM) is nationally accredited by the Accreditation Board for Engineering and Technology (ABET).

Youngstown State University is accredited by the Higher Learning Commission and a member of the North Central Association.

Facilities

Moser Hall is home to the mechanical engineering program and houses classrooms, laboratories, research and development rooms, and high-tech computer facilities. The program maintains laboratories for thermodynamics, heat power, internal combustion engines, heat transfer, fluid mechanics, photo-elasticity, experimental stress analysis, and mechanical vibrations and acoustics. The recently established Hydraulics Laboratory provides the faculty and students with abundant opportunities for research and development.

For more information about this program, go to www.ysu.edu, click on Colleges, then College of STEM
### Professional and Honorary Societies

Mechanical engineering students in good standing are encouraged to acquire membership and participate in student chapters of the American Society of Mechanical Engineers (ASME), the Ohio Society of Professional Engineers, the Society of Women Engineers, the Society of Automotive Engineers (SAE), and the American Nuclear Society.

Outstanding mechanical engineering students may be elected to campus chapters of Tau Beta Pi (national engineering honorary society) and Phi Kappa Phi (honorary society for all disciplines).

Mechanical engineering students also have the opportunity to participate in national design competitions. Recent activities include the SAE Mini-Baja Car Competition, the Supermileage Vehicle Competition, the Walking Robot Competition, the ASME-sponsored Human Powered Vehicle Competition, and the First Robotics Competition.

### Program Educational Objectives

- The program will provide an educational environment rich in opportunities for students to obtain the knowledge and skills that will prepare its graduates for successful careers as a mechanical engineer or for advanced studies.

- The program will provide a comprehensive education for students to be able to identify, formulate, and solve engineering problems by applying fundamental knowledge of mathematics, basic and engineering sciences, and by utilizing modern techniques, methods, skills, and tools.

- The program will provide a strong technical education for students to be able to design a system, components, or process to meet the desired needs, as well as to design and conduct experiments, and to analyze the acquired data and interpret the results.

- Through the University’s General Education Program, the program will provide a general education, complementary to its technical education, for students to be able to function on multidisciplinary teams, communicate effectively, understand the impact of engineering in a global and societal context, professional ethics, contemporary issues in engineering practice, and the necessity of lifelong learning.

### Curriculum Overview

#### First Year
- Calculus 1, 2
- Chemistry 1
- Physics 1
- Engr Concepts
- Engr Computing

#### Second Year
- Calculus 3
- Differential Equations
- Physics 2
- Statics
- Strength of Materials and Lab
- Thermodynamics 1, 2
- Dynamics
- Materials

#### Third Year
- Engr Analysis
- Fluid Dynamics and Lab
- Heat Transfer
- Kinematics
- Stress and Strain Analysis 1 and Lab
- Machine Design and Lab
- Circuits 1
- Engr Statistics

#### Fourth Year
- Mechanical Systems Design 1, 2 and Lab
- Thermal Fluid Applications and Lab
- Control of Mechanical Systems
- Vibration & Control Lab
- MECH Electives
- Dynamics Systems Analysis & Vibrations

#### Mechanical Engineering Electives
- Special Topics
- HVAC
- Solar Engineering
- Heat Transfer 2
- Stress and Strain Analysis 2
- Acoustics
- Finite Element Analysis
- Manufacturing and Lab
- Fluid Power and Control