

MECHATRONICS AND ROBOTICS

Mechatronics and Robotics (MERO) is an emerging and rapidly growing program across universities in the USA. It is an integrated engineering program that consists of mechanical engineering, electrical/electronic engineering, control systems, and computer science. There is high demand in this interdisciplinary major to fill the gap between the need of this workforce and educated/trained engineers. MERO is an excellent major for students interested in mechatronics, robotics, automation, advanced/smart manufacturing, Industry 4.0, etc.

At OSU, the MERO curriculum is as rigorous as engineering programs and is nearly identical to the Mechanical and Aerospace Engineering (MAE) and Electrical and Computer Engineering (ECE) curriculums for the first two years, but the upper-level major courses are taught with more emphasis on applications. Multiple MERO major courses are popular among engineering undergraduate and graduate students who find value in their job search and thesis/dissertation research.

An important element in MERO is the use of laboratory experience as a teaching tool. The MERO program has laboratories in mechatronics, industrial robots, Programmable logic controller (PLC), DC/AC circuits, fluid power, materials, basic instrumentation, 3D printing, computer-aided design, manufacturing, and engineering (CAD/CAM/CAE). Senior capstone design courses integrate the knowledge and skills learned during their course of study. The latest computer software is provided and supported for the courses that MERO students take. Where appropriate, laboratories with modern computer data acquisition systems and on-screen displays are available.

In addition to the required mechatronics and robotics courses, students are provided with a solid foundation in calculus, physics, linear algebra, differential equations, statistics, chemistry, and computer science. Minor degree choices are available in mechatronics for other major students or entrepreneurship.

Program Educational Objectives

The Mechatronics and Robotics (MERO) Engineering Technology program at Oklahoma State University focuses on preparing graduates so that they are able to productively contribute at their workplace after a short introductory period. A graduate from the OSU MERO program should be able to:

1. Introduce new technologies and methods into their workplace to maximize value to their employer.
2. Employ the latest design and analysis tools in the mechatronics and robotics discipline.
3. Work independently as well as collaboratively with others while demonstrating the professional and ethical responsibilities of the engineering profession.
4. Demonstrate professionalism in the workplace by using the highest standards of ethics and personal integrity.
5. Be a life-long learner through participation and membership in professional organizations, a continuation of professional/graduate studies, and/or self-study.

Student Outcomes

Students graduating from the MERO program are expected to achieve the following:

1. an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the discipline;
2. an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline;
3. an ability to apply written, oral, and graphical communication in broadly defined technical and non-technical environments, and an ability to identify and use appropriate technical literature;
4. an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes; and
5. an ability to function effectively as a member as well as a leader on technical teams.