MATERIALS, MECHATRONICS AND MANUFACTURING ENGINEERING

Graduate Programs

The School of Materials, Mechatronics and Manufacturing Engineering offers programs leading to the Master of Science and Doctor of Philosophy. A program of independent study and research on a project under the direction of a member of the Graduate Faculty will be satisfactorily completed by all graduate students. For the Master of Science candidate, the project may result in a thesis. For the Doctor of Philosophy candidate, the project results in a dissertation.

Four research areas of strategic importance have been identified at the Helmerich Advanced Technology Research Center (HRC) at OSU by industry leaders in and around Tulsa. These include: Materials for Energy Technologies, Bio-Materials for Medical Technologies, Advanced Materials for Aerospace, and Materials for Electronics and Control Technologies. All areas fall under the broad umbrella of the School of Materials, Mechatronics and Manufacturing Engineering

Admission Requirements

Admission to either the Master of Science or Doctor of Philosophy degree program requires graduation from a materials science and engineering or related curriculum approved by the ABET or a recognized equivalent from any international program.

Students with related undergraduate degrees, such as chemistry, physics, engineering physics, applied physics, etc., can be admitted conditionally, subject to completing prescribed Materials Science and Engineering program core courses. Admission is competitive based on undergraduate GPA, GRE and TOEFL (for international students), statement of interests, experience and recommendations.

The Master of Science Degree

The **Master of Science in Materials Science Engineering (MSE)** has both thesis and creative component (non-thesis) options. The thesis option requires a total of 30 credit hours, which includes 24 hours of formal coursework (regularly scheduled classes, not independent study) and 6 hours of a thesis. The non-thesis option or creative component requires a total of 35 credit hours, which includes 33 hours of formal coursework (regularly scheduled classes, not independent study) and 2 hours of a creative component or project. The main difference between the two options is that in the thesis option, students conduct independent research, while in the creative component option, students conduct critical review of the literature on an advanced topic of interest to the MSE program. Both options require a professional report or thesis and an oral presentation. Students take 15 hours of core courses (required) with the remainder of the hours being MSE elective courses or their equivalent (to be approved by MSE graduate coordinator and the thesis advisor or has been considered as an equivalent MSE course). Students must complete no less than 21 hours of MSE 5000- and 6000-level courses through Oklahoma State University. For both options the courses taken must include:

Code	Title	Hours
MSE 5013	Advanced Thermodynamics of Materials	3
MSE 5023	Diffusion and Kinetics	3
MSE 5043	Advanced Materials Characterization	3
MSE 5093	Fundamentals of Materials Science	3
MSE 5193	Advanced Materials Processing	3
MSE 5010	Materials Science and Engineering Seminar for Masters Students	0

The **Master of Science in Engineering Technology (MSET)** degree in **Mechatronics and Robotics (MERO)** will provide students with an interdisciplinary applied engineering education through coursework, project, and thesis work. Students will learn fundamental and applied concepts of real world mechatronic and robotic systems including interface theory, sensing and actuation systems, hardware and software integration, modelling and control. Our faculty members have extensive industry experience. Students will have an option to specialize in one or more areas including control systems, artificial intelligence, autonomous vehicles, advanced manufacturing, and soft-robotics. All courses will focus on applied engineering via hands-on learning.

The Doctor of Philosophy Degree

The general credit requirement is a minimum of 90 credit hours beyond the BS degree, including at least 36 hours of credit for research and at least 30 hours of class work. It is expected that the courses must include:

Code	Title	Hours
MSE 5013	Advanced Thermodynamics of Materials	3
MSE 5023	Diffusion and Kinetics	3
MSE 5043	Advanced Materials Characterization	3
MSE 6010	Materials Science and Engineering Seminar for PhD Students	0

Students are responsible for consultation with their doctoral advisory committee in preparing the plan of study. Furthermore, students have to pass the PhD qualifying exam and the dissertation proposal defense to become eligible for candidacy for the PhD Degree, successfully conduct independent research for the dissertation, and pass the final dissertation defense in order to qualify for the PhD degree. More details can be found in the MSE Graduate Student Handbook.