PH.D. IN MATERIALS SCIENCE AND ENGINEERING

Materials Science and Engineering (MSE) research is aimed at educating and training the next generation of thinkers to solve the biggest global challenges.

By fostering a multidisciplinary approach, MSE degree programs strive to endow students with the tools to strategically question current design paradigms and drive innovative materials and manufacturing solutions across a diverse range of sectors. Motivated by modern materials challenges in energy, computing, transportation, impact protection, robotics, and global health care, MSE programs' comprehensive, experiential training is designed to equip graduates with a modernized skill set tailored to confront those challenges head-on.

The MSE Ph.D. degree program is designed to engage students with:

- Active hands-on training in the latest materials characterization and computational methods, materials-focused intellectual property protection and technology transfer, and professional soft skill development.
- Enhanced educational opportunities promoted through industry partnerships, facilitating internships and class time spent in active commercial manufacturing labs.
- A diverse core of faculty mentors driving advances in controlling structure at the nanoscale, predictive property modeling, high performance metal, polymer and ceramic composites, photovoltaics, and additive manufacturing.

The overall objective of the Ph.D. in Materials Science and Engineering is developing science and engineering professionals with multidisciplinary problem solving skills to address global challenges in the field of materials science and engineering.

Students interested in graduate work should refer to the Graduate and Professional Bulletin (https://catalog.colostate.edu/general-catalog/graduate-bulletin/).

Learning Objectives

Similar to the Land Grant mission of extension, education, and research, the specific learning objectives for the MSE programs are centered on the following three themes:

1. Scholarly engagement and research
2. Educational engagement
3. Innovation

Scholarly engagement and research

Students will:

1. Graduate with an understanding of cross-disciplinary materials research in physics, engineering, and chemistry.

Educational engagement

Students will:

1. Synthesize and connect knowledge from the different disciplines of materials research to complete course work and research for their degree.
2. Communicate their science to a wide range of audiences.
3. Understand the life-cycle of materials – from design to manufacture.
4. Engage in team science where they will work with different faculty and different disciplines to answer important and innovative research questions.

Innovation

Students will:

1. Gain experience working in an interdisciplinary research setting to enable them to solve complex real-world problems.
2. Graduate with knowledge and skills necessary to assume careers in a wide variety of organizations and industries related to materials.
3. Understand how their skills are important in solving global-problems.

Diversity

Students will:

1. Gain an appreciation of different disciplines, as well as different approaches to problem solving so they can actively participate in global learning environments.