

INTERDISCIPLINARY MINOR

Materials Science and Engineering

The study of materials science and engineering has spurred breakthroughs in applications ranging from artificial limbs and organs, to space travel vehicles, to personal MP3 players. For example, the discovery of buckyballs and carbon nanotubes has led to the development of an unprecedented reduction in size of prototype electronic components and points the way to tomorrow's electronic technologies. Porous nanostructures of biocompatible materials are studied for targeted drug delivery within the body. The integration of polymers and semiconductors is used to create efficient, usable solar cells to reduce our dependence on fossil fuels. There are many more examples of both existing technologies and current research areas involving materials science and engineering that impact everyday life both today and in the future.

The minor in materials science and engineering is open to all students of the College of Engineering whose science and technical interests involve the design, processing, and optimization of engineering materials. Since the materials interests may vary across the engineering disciplines, the minor is composed of an interdisciplinary selection of courses that offer a high degree of flexibility to the student. The fundamental goals of the program are to offer the students a broad interdisciplinary program that includes a basic background in the relevant aspects of materials science and the engineering applications of materials. The objectives are to serve the needs of the chemical, civil, electrical, and mechanical engineering departments in providing a vehicle to expose students to materials science and engineering. Particular focus areas include: electronic materials and processing for device applications; strength, wear, and corrosion-resistant coatings; molecular-level design of thin films and nanostructures; polymers and biomedical applications; and steels, concretes, and space-based structures.

Minor in Materials Science and Engineering

REQUIRED COURSES

Complete the following course:

ME 2340	Introduction to Materials Science	4 SH
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and complete one additional course from the following list with corresponding lab, as indicated:

CIVE 2260	Civil Engineering Materials	3 SH
with CIVE 2261	Materials and Measurements Lab	2 SH
EECE 3392	Electronic Materials	4 SH

ELECTIVES AND CAPSTONE DESIGN

Complete two courses from the following disciplines, and complete 4 semester hours of capstone design (or complete 4 semester hours of elective course work in place of the capstone design project):

Electrical and Computer Engineering

EECE 4606	Micro- and Nanofabrication	4 SH
ENGR 4608	Nanotechnology in Engineering	4 SH

Chemical Engineering

CHME 4634	Nanomaterials: Thin Films and Structures	4 SH
ENGR 4608	Nanotechnology in Engineering	4 SH

Mechanical and Industrial Engineering

ME 4640	Mechanical Behavior and Processing of Materials	4 SH
ME 5645	Environmental Issues in Manufacturing and Product Use	4 SH

Chemistry and Chemical Biology

CHEM 3501	Inorganic Chemistry	4 SH
CHEM 5687	Principles of Solid State Chemistry	3 SH

Capstone Design

CHME 4703	Chemical Process Design 2	4 SH
EECE 4790	Electrical and Computer Engineering Capstone 1	4 SH
MEIE 4702	Capstone Design 2	5 SH

GPA REQUIREMENT

2.000 GPA required in the minor