Minor in Materials Science and Engineering

About This Program

The Minor in Materials Science and Engineering provides students a foundation in the governing principles of materials science which complements their major field of study, as well as an understanding of the latest trends. As such, the program is flexible in coursework requirements and can be tailored to each student's interest.

Competencies

1. Upon completion of the minor, students will demonstrate knowledge of types of materials, their atomic or molecular bonding mechanisms leading to specific crystal structures, and the method of representing the structure in the frame of Bravais Lattice.
2. Upon completion of the minor, students will demonstrate understanding the principle of basic material analysis methods.

Admissions Criteria

Admission to the Minor in Materials Science and Engineering requires GPA of 2.0 or higher and approval by the Materials Science and Engineering Department undergraduate advisor as well as the student's home department. Information on admissions and course requirements can be obtained from the Materials Science and Engineering undergraduate program advisor. The minor will be conferred at the same time the degree is conferred and the degree and minor will be recorded on the student's transcript. The minor will not be on the diploma. Minors may not be conferred retroactively upon students who have graduated.

SCHOLARSHIPS, RESEARCH EXPERIENCE, AND INTERNSHIP

Scholarships may be available for students who meet the academic requirements set by the Materials Science and Engineering minor program. Minor program students may also work as undergraduate research assistants for Materials Science and Engineering faculty. Internship opportunities at nearby industries may be arranged for students with interest.

Curriculum

Foundations		
MSE 3300	INTRODUCTION TO MATERIALS SCIENCE AND ENGINEERING	3
MSE 4320	NANOSCALE MATERIALS	3
Specialization		
In consultation with advisor, select at least 2 courses from one of the following tracks:		6
Structural Materials and Process Track		
MSE 4310	POLYMER MATERIALS SCIENCE	
MSE 4312	MECHANICAL BEHAVIOR OF MATERIALS	
MSE 4315	INTRODUCTION TO COMPOSITES	
MSE 4321	PHASE TRANSFORMATIONS OF MATERIALS	
MSE 4337	FATIGUE OF ENGINEERING MATERIALS	
MSE 4339	FRACTURE MECHANICS	
or MAE 4339	FRACTURE MECHANICS	
MSE 4357	SYNTHESIS AND PROPERTIES OF MODERN ENGINEERING MATERIALS	
MSE 4359	FAILURE ANALYSIS AND RELIABILITY ENGINEERING	
MAE 4338	FAILURE ANALYSIS	
CHEM 3315	INTRODUCTION TO BIOPHYSICAL CHEMISTRY	
CHEM 3321	PHYSICAL CHEMISTRY I	
CHEM 4318	INORGANIC CHEMISTRY	
CHEM 4346	ADVANCED SYNTHETIC METHODS	
Relevant special topics courses in MAE and CHEM with prior approval of MSE advisor.		
Semiconductor Materials and Technology Track		
MSE 4354	ELECTRONIC MATERIALS AND DEVICES	
MSE 4359	FAILURE ANALYSIS AND RELIABILITY ENGINEERING	
EE 4329	SEMICONDUCTOR DEVICES	
PHYS 4325	SOLID STATE PHYSICS	
PHYS 4326	INTRODUCTION TO QUANTUM MECHANICS	

Relevant special topics courses in EE and Physics with prior approval of MSE advisor.		
Magnetic Materials and Technology Track		
MSE 4321	PHASE TRANSFORMATIONS OF MATERIALS	
MSE 4333	INTRODUCTION TO MAGNETIC MATERIALS	
MSE 4357	SYNTHESIS AND PROPERTIES OF MODERN ENGINEERING MATERIALS	
PHYS 4325	SOLID STATE PHYSICS	
PHYS 4326	INTRODUCTION TO QUANTUM MECHANICS	
Energy Materials and Technology Track		
MSE 4353	FUNDAMENTALS OF SUSTAINABLE ENERGY	
MSE 4355	MATERIALS FOR ENERGY	
REE 3301	PRINCIPLES OF ENERGY ENGINEERING	
REE 3302	SUSTAINABLE ENERGY SYSTEMS	
EE 3302	FUNDAMENTALS OF POWER SYSTEMS	
Electives		
Select 2 from the following:		6
MSE 4310	POLYMER MATERIALS SCIENCE	
MSE 4390	SPECIAL TOPICS IN MATERIALS SCIENCE & ENGINEERING	
MAE 3344	INTRODUCTION TO MANUFACTURING ENGINEERING	
MAE 4342	MECHANICAL DESIGN II	
PHYS 3313	INTRODUCTION TO MODERN PHYSICS	
PHYS 3455	ELECTRONICS	
Any track option course listed above.		
Total Hours		**18**

Program Completion

Prerequisites must be met for all courses. All courses used to satisfy the minor requirements must be passed with a minimum grade of C and their combined GPA must be at least 3.0.

Advising Resources

Location:

ELB 231

Email:

mse@uta.edu

Phone:

817-272-2538

Web:

Schedule an appointment (https://www.uta.edu/academics/schools-colleges/engineering/academics/departments/materials-science/)