Certificate in Nanotechnology

About This Program

The Certificate in Nanotechnology aims to provide the fundamentals, principles and applications of the emerging and exciting field of nanotechnology in the areas of energy, environment, security and human health, with weighted emphasis on the development of new materials and their applications. This program aims at the dual goal of exploring the potential of nanotechnology in addressing current global technological needs while acting as a resource for developing and educating the future workforce. Course material can be available over the internet upon request to accommodate participants from industry who do not have regular access to campus.

Competencies

1. Upon completion of the certificate, students will demonstrate knowledge of types 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 certificate, students will demonstrate knowledge of the types of crystal defects common in crystalline materials, the factors affecting their formation and stability, and their influence on the physical properties.

Admissions Criteria

The certificate is open to all current science and engineering degree-seeking students and holders of a bachelor's degree in science or engineering. For those who have not completed a bachelor's degree, the Certificate in Nanotechnology will be awarded concurrently with an undergraduate degree. The completed certificate program of study will be forwarded to the Office of Admissions, Records and Registration for verification and notation on the student's transcript. A formal certificate will be prepared for the student by the university and recognition will be given at the graduation ceremonies.

Curriculum

Foundations		
MSE 3300	INTRODUCTION TO MATERIALS SCIENCE AND ENGINEERING	3
MSE 4320	NANOSCALE MATERIALS	3
Specialization		
Select 3 courses from one of the following tracks:		9
Micro/Nano Electronics Track		
MSE 4354	ELECTRONIC MATERIALS AND DEVICES	
MSE 4359	FAILURE ANALYSIS AND RELIABILITY ENGINEERING	
EE 4320	DIGITAL VLSI DESIGN	
MAE 3309	THERMAL ENGINEERING	
MAE 4301	SPECIAL TOPICS IN MECHANICAL AND AEROSPACE ENGINEERING	
3 hour undergraduate research course with prior agreement of faculty member and MSE advisor; letter grade will be assigned by evaluation committee.		
Nanobio Track		
MSE 4343	NANOBIOTECHNOLOGY	
MSE 4358	ORTHOPEDIC IMPLANTS - MATERIAL SELECTION AND CHARACTERIZATION	
BE 4372	DRUG DELIVERY SYSTEM	
BE 4373	FORMULATION AND CHARACTERIZATION OF DRUG DELIVERY SYSTEMS	
BE 4333	NANO BIOMATERIALS AND LIVING-SYSTEMS INTERACTION	
BE 4300	SPECIAL TOPICS IN BIOENGINEERING (with prior approval of MSE advisor)	
3 hour undergraduate research course with prior agreement of faculty member and MSE advisor; letter grade will be assigned by evaluation committee.		
Energy Materials Track		
MSE 4353	FUNDAMENTALS OF SUSTAINABLE ENERGY	
MSE 4355	MATERIALS FOR ENERGY	
EE 3302	FUNDAMENTALS OF POWER SYSTEMS	
EE 4328	CURRENT TOPICS IN ELECTRICAL ENGINEERING	
MAE 4301	SPECIAL TOPICS IN MECHANICAL AND AEROSPACE ENGINEERING	

3 hour undergraduate research course with prior agreement of faculty member and MSE advisor; letter grade will be assigned by evaluation committee.	
Total Hours	**15**

Program Completion

Prerequisites must be met for all courses. All courses used to satisfy the certificate requirements must be passed with a minimum grade of C and their combined GPA must be at least 3.0. Consultation with the Materials Science and Engineering (MSE) advisor is encouraged to check the course availability and any changes in the course requirements.

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/)