Erik Jonsson School of Engineering and Computer Science

Minors

Students must take a minimum of 18 semester credit hours for the minor, 12 of which must be upper-division semester credit hours. Students who take a minor will be expected to meet the normal prerequisites in courses making up the minor, and should maintain a minimum GPA of 2.000 on a 4.00 scale (C average). Semester credit hours may not be used to satisfy both the major and minor requirements; however, free elective hours or major preparatory classes may be used to satisfy the minor. Core courses offered by the school may count as lower-division hours toward the minor. Topics courses must be approved by the school.

The undergraduate minors in the Erik Jonsson School of Engineering and Computer Science are the following:

Department of Computer Science

- **Computer Science**
- **Information Assurance**
- **Software Engineering**

Department of Materials Science and Engineering

- **Nanoscience and Technology**

Department of Computer Science

**Faculty**


**Professor Emeritus:** Klaus Truemper

**Associate Professors:** Sergey Bereg, Lawrence Chung, Jorge A. Cobb, Kendra M. L. Cooper, Xiaohu Guo, Kevin Hamlen, Murat Kantarcioğlu, Yang Liu, Andrian Marcus, Neeraj Mittal, Yu-Chung (Vincent) Ng, Kamil Sarac, Haim Schweitzer, Rym Zalila-Wenkstern

**Assistant Professors:** Alvaro Cárdenas, Vibhav Gogate, Zhiqiang Lin, Cong Liu, Ryan McMahan, Nicholas Ruozzi, Lingming Zhang

**Senior Lecturers:** Ebru Cankaya, Michael Christiansen, John Cole, Chris I. Davis, Timothy (Tim) Farage, Neeraj Gupta, Shyam Karrah, Pushpa Kumar, Linda Morales, Nhut Nguyen, Greg Ozbirn, Mark Paulk, Miguel Razo-Razo, William (Bill) Semper, Charles Shields Jr., Jason W. Smith, Janell Straach, Jeyakesavan (Jey) Veerasamy, Don G. Vogel

Minor in Computer Science: 21 semester credit hours

A minor in Computer Science requires 21 semester credit hours earned through the
following courses:

- **CS 1337** Computer Science I
- **CS 2305** Discrete Mathematics for Computing I
- **CS 2336** Computer Science II
- **CS 3305** Discrete Mathematics for Computing II
- **CS 3345** Data Structures and Introduction to Algorithmic Analysis
- **CS 3354** Software Engineering

CS 43XX Elective (any 4000-level organized CS class or **CS 4390**)

Minor in Information Assurance: 30 semester credit hours

A minor in Information Assurance requires 30 semester credit hours earned through the following courses:

- **CS 1337** Computer Science I
- **CS 2305** Discrete Mathematics for Computing I
- **CS 2336** Computer Science II
- **CS 3305** Discrete Mathematics for Computing II
- **CS 3345** Data Structures and Introduction to Algorithmic Analysis
- **CS 4347** Database Systems
- **CS 4348** Operating Systems Concepts
- **CS 4389** Data and Applications Security
- **CS 4393** Computer and Network Security
- **CS 4398** Digital Forensics

Minor in Software Engineering: 21 semester credit hours

A minor in Software Engineering requires 21 semester credit hours earned through the following courses:

- **CS 1337** Computer Science I
- **CS 2305** Discrete Mathematics for Computing I
- **CS 2336** Computer Science II
- **SE 3306** Mathematical Foundations of Software Engineering
- **CS 3345** Data Structures and Introduction to Algorithmic Analysis
- **CS 3354** Software Engineering

SE 43XX Elective (any 4000-level organized SE class)
Goals for the Minor in Nanoscience and Technology

As the field of nanotechnology develops further, particularly in the north Texas region, The University of Texas at Dallas has an important role to play in the education of knowledge workers for the industry. The Minor in Nanoscience and Technology offered by the Department of Materials Science and Technology provides a means for undergraduate students to familiarize themselves with the concepts and principles of nanotechnology.

This minor has been designed around three core NANO designated courses, the content of which is exclusively related to Nanoscience and Nanotechnology. The remaining nine semester credit hours of courses may be chosen from the list of courses below. The contents of the courses BIOL 4461, CHEM 3322, and PHYS 4301 are similar enough that only one of these three courses may count toward the minor. In addition, several lower-division electives have been included to provide streamlined access to the available upper-division electives.

Since the three core courses are all upper-division electives, only one of the remaining nine semester credit hours must be an upper-division course, although students may choose to challenge themselves by pursuing all nine semester credit hours as upper-division electives.

In concordance with the creation of this minor, the Nanoscience (NANO) course designation would be added to the course catalog for use in designating future Nanoscience-specific courses as they are created.

Educational Objectives for the Minor in Nanoscience and Technology

On completion of the Minor program, students will:

- Have a comprehensive general education background
- Have a working knowledge of nanotechnology and nanoscience principles and industry applications
- Be able to apply key concepts in materials science, chemistry, physics, biology, and engineering to the field of nanotechnology
- Understand the societal and technology issues that may impede the adoption of nanotechnology
- Have the ability to communicate effectively and work collaboratively
- Be able to become successful professionals and, if they desire, be able to pursue graduate study
- Be able to identify career paths and requisite knowledge and skills for career change
Requirements for the Minor in Nanoscience and Technology
A total of 18 semester credit hours are required, consisting of three core classes (9 semester credit hours) and 9 additional semester credit hours of electives.

I. Core Requirements: 9 semester credit hours

   NANO 3301 Introduction to Nanoscience and Nanotechnology
   NANO 3302 Microscopy, Spectroscopy, and Nanotech Instrumentation
   NANO 4V95 Undergraduate Research in Nanotechnology

II. Elective Requirements: 9 semester credit hours
Students must complete at least nine semester credit hours chosen from the following courses. At least one of the courses must be upper-division (3000 or 4000):

   Nano-designated courses:
      NANO 3310 Introduction to Materials Science
      NANO 4391 or EE 4391 Technology of Plasma
      NANO 4V95 Undergraduate Research in Nanotechnology
      Any other upper-division NANO-designated course

   Lower-division courses:
      CHEM 2323 Introductory Organic Chemistry I
      CHEM 2325 Introductory Organic Chemistry II
      MATH 2451 Multivariable Calculus with Applications
      PHYS 2303 Contemporary Physics
      MECH 2320 Mechanics of Materials

   Upper-division courses:
      PHYS 4352 Concepts of Modern Physics
      PHYS 4383 Plasma Physics
      MECH 4360 Introduction to Nanostructured Materials
      MECH 4370 Introduction to MEMS
      EE 4392 Introduction to Optical Systems
      EE 3310 Electronic Devices
      EE 3311 Electronic Circuits
      CHEM 4335 Polymer Chemistry
      CHEM 3472 Instrumental Analysis
      CHEM 4473 Physical Measurements Laboratory
Only one of the following courses may be used to count toward the Minor:

- **CHEM 3321** Physical Chemistry I
- **CHEM 4355** Computational Modeling
- **BIOL 4461** Biophysical Chemistry
- **CHEM 3322** Physical Chemistry II
- **PHYS 4301** Quantum Mechanics I