

Nano-Science and Technology (14NSTM)

Description

The Center for Advanced Self-Powered Systems of Integrated Sensors and Technologies (ASSIST) is offering a minor in Nano-Science and Technology for any student enrolled in an engineering curriculum. Students will be trained in the fundamentals of nano-scale materials, devices, and systems for a broad variety of applications. This is a multidisciplinary program consisting of courses from a variety of engineering disciplines. Completion of this minor will prepare undergraduate students for the global workforce by combining technical training in nano-science and technology with diversity awareness, engineering ethics, and an understanding of global issues in science and technology.

- Completion of the minor requires a *minimum of 18 credit hours*. This includes one required introductory course, three technical elective courses, and two general education elective courses.
- All courses counted for the minor must be completed with a grade of “C-” or better. Students may not take minor coursework on a credit-only (S/U) basis.

Required Courses

- E 304 Introduction to Nano Science and Technology (3 cr)

Technical Electives (9 credit hours required)

Students are required to complete three courses from the technical electives, which cover specific topics related to nano-science and technology. These courses are offered by a variety of engineering departments. To underscore the multidisciplinary nature of the minor, it is required that at least one of the technical electives comes from outside the student’s home department. The approved technical electives are listed here:

- CHE 465 Colloidal and Nanoscale Engineering
- CHE 460 Nano-Electronic Materials
- BEC/CHE 462 Fundamentals of Bio-Nanotechnology
- BME 422 Fundamentals of Biomedical Instrumentation
- BME 425 Bioelectricity
- BME 412 Biomedical Signal Processing
- TE/BME 466 Polymeric Biomaterials Engineering
- MAE 495 Special Topics in MAE (Topic must be approved by advisor)
- MSE 460 Microelectronics Materials
- MSE 465 Introduction to Nanomaterials
- ECE 404 – Introduction to Solid-State Devices
- ECE 442 Integrated Circuit Technology and Fabrication
- ECE/CHE 468 Conventional and Emerging Nanomanufacturing Techniques and Their Applications in Nanosystems

The above list can be supplemented by special topics classes when available. See coordinator for applicable options.

General Education Electives (6 total credits required)

The general education requirement will equip students with the professional skills necessary for success in a global engineering environment. These courses come from the NCSU General Education Program (GEP) lists, and may count towards a student’s GEP requirements as well as the minor.

One course is required from each of the two categories below

Engineering Ethics (3 credit hours)

- STS 302 Contemporary Science, Technology and Human Values
- STS 304 Ethical Dimensions of Progress
- PHI/STS 325 Bio-Medical Ethics
- PHI 375 Ethics

Diversity and Global Issues in Science and Technology (3 credit hours)

- STS/WGS 210 Women and Gender in Science and Technology
- STS 214 Introduction to Science, Technology, and Society
- PS 314 Science, Technology, and Public Policy

Admissions and Certification of Minor

Students must complete the *Application for Nano-science and Technology Minor* form available from the minor program administrator prior to enrolling in the minor. The program administrator will oversee admission to, and certify completion of the minor program. Prior to admission, qualified students will meet with the program administrator. During this meeting a plan of work for the minor detailing which courses will be taken each semester will be designed and signed by the student. Students will then be required to consult with the program administrator during each registration period to ensure satisfactory progress. All courses counted for the minor must be completed with a grade of "C-" or better. Students may not take minor coursework on a credit only (pass/fail) or S/U basis. The program administrator will verify that all requirements have been met, and certify the minor prior to graduation. The minor must be completed no later than the semester in which the student expects to graduate from his or her degree program. Paperwork for certification should be completed no later than during the registration period for the student's final semester at N.C. State.

Contact Person

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