Descriptions of Courses

NST510 Introduction to Modern Physics
The goal of this course is to help students understand the physical concepts necessary to understand physical phenomena at the nanoscale.

NST520 Introduction to Nano-(Bio)chemistry
The goal of this course is to understand the general chemistry for students who don't have chemistry background.

NST530 Introduction to Physiology
Understanding toward co-ordinations and integrations of physiologic processes in the body at the level of nano-molecular-cellular-tissue-organ levels.

NST535 Introduction to Biochemistry
The goal of this course is to understand the biophysical properties and principles of biological processes.

NST540 Nanoscience and Technology Laboratory
Nanoscale physics/chemistry/biology laboratory course operated in a lab-rotation style.

NST550 Nanofabrication Laboratory
A hands-on experiment and lecture using cutting-edge nano fabrication technology, offered in collaboration with National Nanofab Center.

NST621 Structural Analysis of Biological Macromolecules
In this class we will discuss theoretical background and practical applications of NMR and x-ray crystallographic techniques used for structural studies of biological macromolecules.

NST631 Bio-imaging
The course provides principles of microscopy (wide-filed and confocal microscopes, and TIRF), live cell imaging, and new imaging techniques (FRET, FRAP, FLIP, and so on). The end of course will show how to understand cell and protein functions using cell imaging techniques.

NST651 Computational Nanomaterials Physics
Computational simulation is considered as a third means in modern research sciences, in addition to traditional experiment and theory. Last 20 years, predicting power of computational nanomaterials physics has been improved significantly owing to rapid development of supercomputing multiprocessors. In this class, we will review modern methodologies of computational materials physics and their applications to molecules, nanoclusters, nanotubes, and proteins, and finally acquire basic computational skills by performing term-projects on selected topics.

NST652 Biomedical Optics
This course provides an introduction to optical principles, technologies, and instruments that are being used in a variety of scientific and engnineering fields including biomedical research. The intended audience is the undergraduate and graduate students in the Department of nanoscience and technology as well as other departments (eg. biological sciences, chemistry, bioengineering, mechanical engineering), who wish to learn multidisciplinary optics in real-world applications as well as cutting-edge research.

NST653 Electrochemistry and Nanoscience
Key topic areas of electrochemistry: 1. Electrostatics and Electrokinetics: The basics of Electrode potentials, Electrical Double Layers, Structure, Diffusion, Migration, and Reaction of the interfacial region. 2. Applications: Chemical Sensors. 3. Current hot topics related with electrochemistry in nanoscience.

NST717 Topics in Nanoscience and Technology
This course is a survey of many different methods for depositing, and analyzing, thin films, in particular for semiconductor applications. Designed for graduate students who are starting work on thin-film related research, elementary knowledge of quantum mechanics, thermodynamics, and solid state physics is recommended

NST831 Advanced Genetics

Basic concepts of eukaryotic genetics and various genetic tools for analysis of gene function will be introduced. Use of genetic model systems for studying biological phenomena and diseases will be discussed. Lectures will focus on research articles.

NST960 M.S. Thesis

NST966 Seminar