

NANOBIOTECHNOLOGY CERTIFICATE

With financial support from the North Carolina Biotechnology Center, UNC-Chapel Hill and NC State University offer graduate certificates in nanobiotechnology. Tremendous advances in the development of nanoscale, nanostructured and nano-enabled materials for biotechnology applications are currently taking place. In particular, the development of advanced materials (e.g., electronic materials, optical materials, biologically-derived materials and nanoscale materials) will allow for the development of next-generation systems for use in medicine, homeland defense and agriculture.

These systems will provide the integration of multiple functions, miniaturization of devices, an increase in stability and a decrease in cost. In order for universities, companies and governmental agencies to pursue this highly specialized work, students must be trained at the graduate level to perform work at the interface of nanoscale science and biotechnology. The Nanobiotechnology certificates are aligned with the need for highly trained professionals to nurture the rapid growth of nanobiotechnology infrastructure in North Carolina. The keystone of the certificates at both universities is a core nanobiotechnology course (BME 540, 3 credit hours), in which lectures, open discussions and student presentations will be used to introduce students to this area of study.

Course Requirements

Code	Title	Hours
Core Courses		
BME 540 (NC State course)		3
Electives		
9 minimum credit hours of elective courses are required from the lists below.		9
Minimum Hours		12

Code	Title	Hours
UNC Electives		
BCB 720	Introduction to Statistical Modeling	3
BCB 724	Data Communication	1
BCB 730	Fundamentals of Quantitative Image Analysis for Light Microscopy	1
BCB 731	Critical Readings in Biomedical Statistics and Machine Learning	2
BIOC 655	Principles of Cellular and Molecular Biochemistry	3
BIOL 631	Advanced Molecular Biology	4
BIOL 632	Advanced Molecular Biology II	3
BMME 511	Genetic Engineering	3
BMME 524	Biomolecular Sensing Technologies	3
MCRO 614	Immunobiology	3
PHCO 701	Introduction to Molecular Pharmacology	3
TOXC 707	Advanced Toxicology	3
TOXC 735	Regulatory Toxicology-Interacting with regulatory agencies & approval for drug, device, and chemical	3
NC State Electives		
BEC 472		3
BEC 572		3
BEC 562		3

BEC 575	3
BIT 501	3
BIT 510	3
BME 540	3
BME 566	3
CHE 568	3
ECE 518	3
ECE 568	3
ISE 718	3
MAE 536	3
MAE 539	3
MAE 558	3
MSE 539	3
MSE 565	3
MSE 566	3
MSE 712	3
MSE 718	3
MSE 721	3
MSE 723	3

Non-Course Certificate Requirement