

NANOSCIENCE, PH.D.

The Ph.D. in Nanoscience requires a minimum of 49 credit hours and is designed to prepare students to take positions in industrial, governmental, or academic research settings by providing a solid background in nanoscience theory and experimental techniques through course work and dissertation research. Advanced elective courses in nanoscience areas ensure students will have substantial depth of understanding in their area of interest and enable them to effectively carry out advanced nanoscience research.

For information regarding deadlines and requirements for admission, please see the Guide to Graduate Admissions (<https://grs.uncg.edu/prospective/guide/>).

In addition to the application materials required by The Graduate School, applicants must submit a personal statement indicating their interest in the program and a current Curriculum Vitae.

Qualified applicants with a B.S. degree in an area related to nanoscience (physics, chemistry, biology, mathematics, computer science, or engineering) and, as a minimum, completed calculus through differential equations may apply to the Ph.D. program.

Degree Program Requirements

Required: 49 credit hours

Code	Title	Credit Hours
Foundations of Nanoscience Courses (6 credits)		
NAN 700	Principles of Nanoscience I: Physical, Chemical, and Biological Foundations	3
NAN 706	Principles of Nanoscience II: Analytical, Statistical, and Computational Foundations	3
Advanced Nanoscience Courses (12 credits)		
Select one concentration option (12 credits) from the following:		12
<i>Without a concentration</i>		
NAN 727	Principles of Quantum and Solid State Physics	
NAN 729	Mathematical Methods in Modeling Complex Systems	
NAN 731	Systems and Synthetic Biology	
NAN 732	Nanomaterials Chemistry	
NAN 733	Physical Biology	
Two approved elective courses (6 credits)		
<i>Synthetic Biology Concentration</i>		
<i>Material Science and Nanomaterials Concentration</i>		
Additional Required Courses (13 credits)		
NAN 707	Lab Protocols and Practice ¹	6
NAN 708	Science Communications ¹	6
NAN 710	Scientific Integrity	1
Dissertation Research (18-30 credits)		
NAN 790	Doctoral Research ²	6
NAN 799	Nanoscience Dissertation Research ³	12-24
Total Credit Hours		49

¹ Students must complete NAN 707 and NAN 708 twice each for a total of 6 credits each.

² Students must take NAN 790 twice for a total of 6 credits.

³ Students must complete a minimum of 12 credits in NAN 799.

Materials Science and Nanomaterials Concentration

Code	Title	Credit Hours
Required Courses (6 credits)		
Select two courses (6 credits) from the following:		6
NAN 727	Principles of Quantum and Solid State Physics	
NAN 729	Mathematical Methods in Modeling Complex Systems	
NAN 732	Nanomaterials Chemistry	
Elective Courses (6 credits)		
Select two courses (6 credits) from the following: *		6
NAN 728	Nanotechniques	
NAN 748	Macromolecular and Supramolecular Chemistry	
NAN 749	Introduction to Spectroscopy Methods in Nanoscience	
NAN 755	Biomimetics and Biomaterials	
NAN 762	Nanoscale Reactions	
NAN 764	Materials, Syntheses, and Processes by Design	
NAN 771	Computational Quantum Nanochemistry	
Total Credit Hours		12

* Or elective course approved by the student's committee and advisor.

Synthetic Biology Concentration

Code	Title	Credit Hours
Required Courses (6 credits)		
Select two courses (6 credits) from the following:		6
NAN 731	Systems and Synthetic Biology	
NAN 732	Nanomaterials Chemistry	
NAN 733	Physical Biology	
Elective Courses (6 credits)		
Select two courses (6 credits) from the following: *		6
NAN 750	Nanomedicine	
NAN 752	Molecular Biology in Nanosciences	
NAN 753	Introduction to Stem Cell Biology and Ethics	
NAN 754	Immunology	
NAN 755	Biomimetics and Biomaterials	
NAN 757	Nanomechanics	
Total Credit Hours		12

* Or elective course approved by the student's committee and advisor.

Required Milestones*

- Residency (Immersion)
- Plan of Study
- Research Competency
- Comprehensive Exam (Written & Oral)
- Dissertation Proposal
- Admission to Candidacy
- Dissertation Defense

- Filing the Final Approved Dissertation
- Publication of at least one Peer-Reviewed Manuscript
- Annual Committee Meetings
- Attendance and Participation in Departmental Seminar Program

* *General information about milestones for doctoral programs is available in Section III (<https://catalog.uncg.edu/academic-regulations-policies/graduate-policies/#sectioniiisummaryofgraduateschoolregulationsforallcertificatesanddegreestext>) of the Graduate Policies (<https://catalog.uncg.edu/academic-regulations-policies/graduate-policies/>) page in the University Catalog. For information about how milestones are accomplished for a specific program, please refer to the doctoral program's handbook.*

Accelerated B.S. in Physics to Ph.D. in Nanoscience

Application and Admission

Qualified UNC Greensboro undergraduate students who are pursuing the B.S. in Physics may apply for admission to the accelerated B.S. to Ph.D. in Nanoscience. A cumulative undergraduate GPA of at least 3.5 based on at least 30 credits earned at UNC Greensboro is required. Students must also maintain a 3.5 GPA in the courses listed under Major Requirements and Additional Area Requirements in the undergraduate program.

Applicants will be required to take the Graduate Record Examination (GRE) during the second semester of their junior year. Applicants must have completed at least 60 credits before applying for admission to the accelerated program. During the summer after their junior year applicants will complete the accelerated program information when applying for admission to the Ph.D. degree program.

Courses

Admitted students may apply the following 12 credits of graduate-level course work toward completion of both the undergraduate and graduate degree, provided that they earn a grade of B (3.0) or better in each course and fulfill graduate-level requirements:

Code	Title	Credit Hours
NAN 601	Nanomaterials Chemistry	3
NAN 602	Physical Biology	3
NAN 603	Principles of Quantum and Solid State Physics	3
NAN 605	Mathematical Methods in Modeling Complex Systems	3

Please consult with an advisor to determine how the courses taken at the graduate level will meet requirements in the bachelor's degree program. All degree requirements for the Ph.D. in Nanoscience remain the same.