NANOSCIENCE, M.S.

The 30 credit hour, non-thesis, online M.S. in Nanoscience follows the Professional Science Master's degree model, featuring coursework in nanosciences and business and an internship to provide practical experience. It is designed for students with strong backgrounds in technical fields who seek additional specialized training to qualify them for positions in companies that work in the field of nanotechnology.

The on-campus M.S. in Nanoscience Thesis Option is a 30 credit hour program that includes the completion of a 6 credit thesis. Students are expected to start their research project during their first year in the program.

For information regarding deadlines and requirements for admission, please see the Guide to Graduate Admissions.

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 will have a BS degree in an area related to nanoscience (physics, chemistry, biology, mathematics, computer science, or engineering).

Degree Program Requirements

Required: 30 credit hours

Non-Thesis Option

Nanoscience Survey Courses (9 credits)
Select 9 credits from the following:
- NAN 601 Nanomaterials Chemistry
- NAN 602 Physical Biology
- NAN 603 Principles of Quantum and Solid State Physics
- NAN 604 Nanotechniques
- NAN 605 Mathematical Methods in Modeling Complex Systems

Disciplinary Foundation Courses (9 credits)
Select 9 credits from the following:
- NAN 609 Nanosafety
- NAN 615 Introduction to Spectroscopy Methods in Nanoscience
- NAN 620 Immunology
- NAN 625 Molecular Biology in Nanosciences
- NAN 626 Introduction to Stem Cell Biology and Ethics
- NAN 630 Advances in Bio-Sensors
- NAN 655 Biomimetics and Biomaterials

Business/Management Courses (9 credits)
Select 9 credits
- NAN 609 Nanosafety
- NAN 615 Introduction to Spectroscopy Methods in Nanoscience
- NAN 620 Immunology
- NAN 625 Molecular Biology in Nanosciences
- NAN 626 Introduction to Stem Cell Biology and Ethics
- NAN 630 Advances in Bio-Sensors
- NAN 655 Biomimetics and Biomaterials

Thesis Option

Fundamentals of Nanoscience Courses/Survey Courses (12 credits)
Select 12 credits from the following:
- NAN 601 Nanomaterials Chemistry
- NAN 602 Physical Biology
- NAN 603 Principles of Quantum and Solid State Physics
- NAN 604 Nanotechniques
- NAN 605 Mathematical Methods in Modeling Complex Systems

Disciplinary Foundation Courses (6 credits)
Select 6 credits from the following:
- NAN 609 Nanosafety
- NAN 615 Introduction to Spectroscopy Methods in Nanoscience
- NAN 620 Immunology
- NAN 625 Molecular Biology in Nanosciences
- NAN 626 Introduction to Stem Cell Biology and Ethics
- NAN 630 Advances in Bio-Sensors
- NAN 655 Biomimetics and Biomaterials

Laboratory Rotation (4 credits)
- NAN 611 Nanoscience Laboratory Rotation

Nanoscience Seminar Course (2 credits)
- NAN 621 Professional Development Seminar I
- NAN 622 Professional Development Seminar II

Thesis Credits (6 credits)
- NAN 699 Thesis

Total Credit Hours 30

Instrumentation Concentration

The Master of Science in Nanoscience Instrumentation concentration involves coursework on the theory and application of nanoscale characterization and analytical instruments including scanning electron microscopy, optical microscopy techniques, atomic force microscopy, Energy-dispersive X-ray spectroscopy (EDX), and surface analysis tools like the Raman spectroscopy and X-ray photoelectron spectroscopy (XPS). This new Master of Science concentration will train individuals in the theory, operation, and implementation of these instruments in the context of material characterization.

Core Course in Instrumentation (3 credits)
- NAN 604 Nanotechniques

Fundamentals of Nanoscience Courses (6 credits)
Select two courses (6 credits) from the following:
- NAN 601 Nanomaterials Chemistry
- NAN 602 Physical Biology
- NAN 603 Principles of Quantum and Solid State Physics
- NAN 604 Nanotechniques
- NAN 605 Mathematical Methods in Modeling Complex Systems

Laboratory Rotations (4 credits)
- NAN 611 Nanoscience Laboratory Rotation

Nanoscience Seminar Course (2 credits)
NAN 621  Professional Development Seminar I 1
NAN 622  Professional Development Seminar II 1

**Instrumentation Electives (9 credits)**

Select three courses (9 credits) from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAN 615</td>
<td>Introduction to Spectroscopy Methods in Nanoscience</td>
<td></td>
</tr>
<tr>
<td>NAN 623</td>
<td>Optical Microscopy for Nanoscience</td>
<td></td>
</tr>
<tr>
<td>NAN 624</td>
<td>Particle Beam Microscopy for Nanoscience</td>
<td></td>
</tr>
<tr>
<td>NAN 625</td>
<td>Molecular Biology in Nanosciences</td>
<td></td>
</tr>
<tr>
<td>NAN 630</td>
<td>Advances in Bio-Sensors</td>
<td></td>
</tr>
</tbody>
</table>

**Internship (6 credits)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAN 698</td>
<td>Professional MS in Nanoscience Internship*</td>
<td>6</td>
</tr>
</tbody>
</table>

Total Credit Hours 30

* 3-credit course taken twice for 6 credits total.