

Materials and Nanotechnology Doctorate

Department Information

- **Program Information:**
ndsu.edu/programs/graduate/materials-and-nanotechnology (<http://ndsu.edu/programs/graduate/materials-and-nanotechnology/>)
- **Department Web Site:**
ndsu.edu/materials_nanotechnology/ (http://ndsu.edu/materials_nanotechnology/)
- **Application Deadline:**
April 1 for fall semester.
- **Credential Offered:**
Ph.D.
- **Test Requirement:**
GRE recommended
- **English Proficiency Requirements:**
TOEFL iBT 71, IELTS 6; Duolingo 105

Apply Now (https://ndsugrad.my.site.com/Application/TX_SiteLogin/?startURL=/Application/TargetX_Portal__PB)

Core Curriculum

Code	Title	Credits
MNT 729	Materials Characterization	3
MNT 730	Nanotechnology and Nanomaterials	3
MNT 732	Physical Properties of Materials	3
MNT 745	Preparing Future Researchers	1
MNT 756	Molecular Modeling	3
MNT 760	Materials Synthesis Processing	3
MNT 790		1

Students must complete at least an additional 12 credits of graduate level coursework. The courses should be chosen by the students in consultation and with the approval of the student's supervisory committee.

Suggested courses include the following:

Code	Title	Credits
Microelectronics Focus		
ABEN 682	Instrumentation & Measurements	3
CPM 796	Special Topics	2
CHEM 766	Quantum Chemistry I	4
CHEM 767	Quantum Chemistry II	2
ENGR 780		3
ECE 751	Electromagnetic Theory and Applications	3
IME 627	Packaging for Electronics	3
IME 720		3
IME 635	Plastics and Injection Molding Manufacturing	3
MNT 735		3
PHYS 771	Quantum Physics I	3
Biomaterials Focus		
ABEN 758	Applied Computer Imaging and Sensing for Biosystems	3
BIOC 716	Protein and Enzyme Biochemistry	3
BIOC 673	Methods of Biochemical Research	3
CE 725	Biomaterials-Materials in Biomedical Engineering	3

CPM 771	Modern Methods of Polymer Characterization	3
ME 668	Introduction to Biomechanics	3
ME 731	Mechanical Behavior of Materials	3
ME 743		3
ECE 685	Biomedical Engineering	3
ECE 687	Cardiovascular Engineering	3
PSCI 611	Principles of Pharmacokinetics and Pharmacodynamics	3
PSCI 701	Quantative Drug Design	2
Nanomaterials Focus		
CE 641	Finite Element Analysis	3
CE 793		3
CPM 673	Polymer Synthesis	3
CHEM 766	Quantum Chemistry I	4
CHEM 767	Quantum Chemistry II	2
CPM 686	Corrosion and Materials	3
CPM 773	Organic Chemistry Of Coatings	3
CPM 782	Applied Polymer Colloid Science	3
CPM 796	Special Topics	3
IME 720		3
ME 682	Fuel Cell Science and Engineering	3
ME 712	Advanced Finite Element Analysis	3
ME 733	Polymer Nanocomposites	3
ME 734	Smart Materials and Structures	3
PHYS 758	Statistical Physics	3
PHYS 781	Solid State Physics	3
General Materials Science and Engineering Focus		
ABEN 658	Process Engineering for Food, Biofuels and Bioproducts	3
ABEN 644	Transport Processes	3
ME 673	Engineering with Polymeric Materials	3
CE 641	Finite Element Analysis	3
CE 720	Continuum Mechanics	3
CHEM 732	Advanced Survey of Analytical Chemistry	4
CHEM 736	Mass Spectrometry	2
CPM 673	Polymer Synthesis	3
ME 633		3
ME 751	Advanced Thermodynamics	3
PHYS 611	Optics for Scientists & Engineers	3
PHYS 781	Solid State Physics	3

Admission and Application Requirements

Graduate School admission and application requirements are found on the Admission Information (<https://catalog.ndsu.edu/past-bulletin-archive/2025-2026/graduate/admission-information/>) page. In addition to these requirements, the following is required :

- A degree in the discipline of chemistry, engineering, material science and engineering, physics, polymer science, polymer engineering, or related field.