NC STATE UNIVERSITY

Materials Science and Engineering

Master of Nanoengineering

The Master of Nanoengineering (MNAE) is an on-campus and distance education program designed for students with an undergraduate degree in a science or engineering discipline who wish to pursue a graduate degree in nanoengineering. Students will achieve an understanding of the fundamental advantages in nanoscale materials, devices and systems. It is a 30 credit hour degree program that does not require a thesis, final oral exam or on-campus residency. GRE scores are not required. NC State has an existing strength in nanostructured materials and devices.

ADMISSION

To be admitted, a student must have a BS degree in STEM (i.e., chemistry, physics, engineering) from an accredited university with a GPA of at least **3.0** in their major, three letters of recommendation, official transcripts, written statement, exam scores, and a completed application.

MNAE DEGREE REQUIREMENTS

- Completion of the MNAE requires 30 graduate credit hours (CH) with an overall GPA of 3.0
- Coursework must include 12 credit hours in core courses, a minimum of 12 credit hours from concentration areas and 6 technical elective credit hours (e.g., in *another specialization* or *math*)
- A minimum of 3 courses are required in concentration areas: *1) materials science in nanoengineering*, *2) nanoelectronics and nanophotonics*, and *3) biomedical sciences in nanoengineering*
- NC State Non-Degree Studies (NDS) students admitted to the program may apply a maximum of 12 hours toward the 30 credit hour requirement. Courses from other universities must be approved.
- Students must maintain continuous enrollment each fall and spring semester until completing the MNAE. Students in good academic standing may request a leave of absence from the Director of Graduate Programs in Nanoengineering. The leave may not exceed two semesters.
- A 6-year time limit for completion of the MNAE is required

MNAE CONTACT

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DISTANCE EDUCATION ADVISOR

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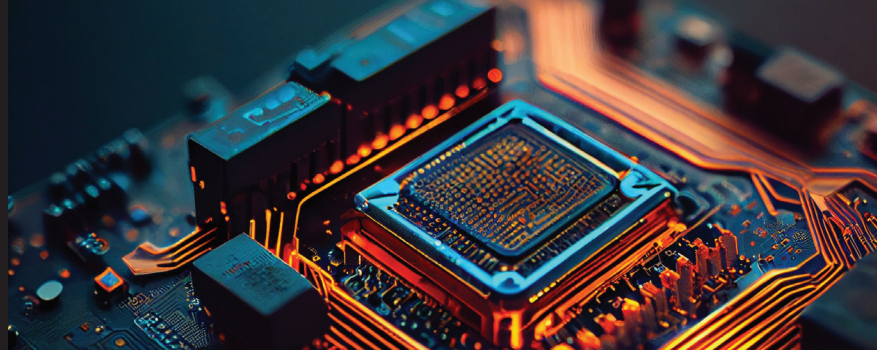
MASTER OF NANOENGINEERING

The field of nanoengineering is expected to revolutionize technology and improve quality of life, particularly as related to energy, environment, and health.



PROGRAM LOGISTICS

It is strongly encouraged to begin your application as soon as possible to benefit from the advising process. Applicants do not have to be admitted to the program to enroll in a course. Prior to applying, qualified applicants may enroll in graduate courses as an NDS student. The NDS classification is designed to complement academic work without a current admission in a degree program. Those who are not pursuing a degree at NC State do not need to apply for official admission. Applicants pursuing the MNAE degree must formally apply to the Graduate School. If the distance version is desired, select "Distance Track" in the Engineering Online application.

COURSE REGISTRATION

On-campus students register for courses through MyPack Portal. Distance education students register for online courses through Engineering Online at engineeringonline.ncsu.edu. Distance students cannot register through the University MyPack Portal system for Engineering Online courses.

COURSE OFFERINGS

PART I: CORE COURSES

COURSE (Select **12 hours** of the following:)	**CH**
MSE 500 Modern Concepts in Materials Science	3
MSE 565 Introduction to Nanomaterials	3
MSE 723 Materials Informatics	3
MSE 791 Quantitative Materials Characterization Techniques	1-3
ECE/CHE 568 Conventional & Emerging Nanomanufacturing Techniq.	3
ECE 592 Emerging Frontiers in Nano/Micro	1-6
ECE 592 Python in Engineering	1-6
ISE 718 Micro/Nanoscale Fabrication and Manufacturing	3
MAE 536 Micro and Nano Electromechanical Systems	3

REQUIRED CORE COURSES TOTAL: 12 hours

PART II: CONCENTRATION COURSES

MATERIALS SCIENCE IN NANOENGINEERING

COURSE (Select **12 hours** of the following:)	**CH**
MSE 702 Defects in Solids	3
MSE 706 Phase Transformations & Kinetics	3
MSE 708 Thermodynamics of Materials	3
MSE 710 Crystallography & Diffraction	3
MSE 715 Fundamentals Transmission Elec. Micros*	4
MSE 721 Nanoscale Simulations & Modeling	3

NANOELECTRONICS AND NANOPHOTONICS

COURSE (Select **12 hours** of the following:)	**CH**
ECE 530 Physical Electronics	3
ECE 534 Power Electronics	3
ECE/BME 518 Wearable Biosensors	3
ECE 542 Neural Networks	3
ECE/MSE 589 Solid State Sol/Therm Energ Harvesting	3
ECE 723 Optical Prop. of Semiconductors	3
CHE 560 Chem. Process of Elec. Materials	3
MSE 760 Mat Sci in Processing Semicond. Devices	3
MSE 771 Materials Science of Nanoelectronics	3

BIOMEDICAL SCIENCES IN NANOENGINEERING

COURSE (Select **12 hours** of the following:)	**CH**
BME 590 Intro to Nano-Biomaterials	1-6
BME 540 Nanobiotechnology	3
BME 566 Polymeric Biomaterials Eng.	3
CHE 596 Colloid Science and Nanoscale Eng.	1-3
CHE 596 Drug Delivery	1-3
ECE 542 Neural Networks	3
ECE/BME 518 Wearable Biosensors	3

CONCENTRATION COURSES TOTAL: 12 hours

PART III: RESEARCH PROJECT

COURSE	**CH**
MSE 795, Master of Nanoengineering Project	1-3

** On campus only*

READY TO APPLY TO THE MNAE? GO TO: go.ncsu.edu/mse-mnae