Materials Science and Engineering (Certificate)

The Graduate Certificate Program (GCP) in Materials Science and Engineering (MSE) is designed for working professionals who do not have formal training in MSE, but wish to acquire a basic understanding of materials science to improve their on-the-job experience and knowledge. Most people will enroll in this program as distance education students through the Engineering Online (EOL) office at NC State University. Students can customize their particular certificate programs to focus on specific areas of materials science that interest them.

Program of Study

The MSE GCP requires a total of 12 credit hours, including MSE 500 (3 credit hours) and three MSE elective courses (9 credit hours) selected by the student. MSE 500 is a fast-paced overview of the field of materials science and engineering and is designed for students who do not have a formal background in MSE, such as those with BS degrees in chemistry, physics and other fields of engineering. MSE 500 also provides the foundation for more specialized MSE graduate courses.

Each course is 3 credit hours and most courses are offered at least once per year through the EOL office. By judicious selection of elective courses, students can customize their GCP to focus on areas of interest to them.

More Information

Program Website (https://www.mse.ncsu.edu/graduate/certificate-program/)

Distance Website (https://www.mse.ncsu.edu/)

Admissions Requirements

To be admitted to the MSE Graduate Certificate Program, a student must have a BS degree in the sciences or engineering from a regionally accredited four-year college or university, and have an overall (or major) GPA of at least 3.0 on a 4-point scale.

All new students must complete the NCSU Graduate School application for admission to the MSE GCP. The GRE exam is NOT required for admission to the GCP. Application deadlines are March 1 for summer and fall admission, and October 1 for spring admission. Students can begin study in the fall, spring or summer semester immediately following their acceptance into the program.

Academic success in the MSE GCP might have a strong bearing on admission to a graduate degree program. However, completion of a graduate certificate program IN NO WAY guarantees entry into a graduate degree program, which must be done through a separate application process.

Applicant Information

- **Delivery Method:** On-Campus, Online, Hybrid
- **Entrance Exam:** None
- **Interview Required:** None

Application Deadlines

- **Fall:** March 1
- **Spring:** October 1
- **Summer 1:** March 1

Plan Requirements

Code	Title	Hours	Counts towards
Required Courses		**12**	
MSE 500	Modern Concepts in Materials Science		
Select a minimum of three courses from "MSE Courses" listed below			
Total Hours		**12**	

MSE Courses

Code	Title	Hours	Counts towards
Select a minimum of three of the following courses:		**9**	
MSE/NE 509	Nuclear Materials		
MSE 540	Processing of Metallic Materials		
MSE 545	Ceramic Processing		
MSE 555	Polymer Technology and Engineering		
MSE 556	Composite Materials		
MSE 560	Microelectronic Materials Science and Technology		
MSE 561	Organic Chemistry Of Polymers		
MSE 565	Introduction to Nanomaterials		
MSE 566	Mechanical Properties of Nanostructured Materials		
MSE 576	Technology Entrepreneurship and Commercialization I		
MSE 577	Technology Entrepreneurship and Commercializatior II		
MSE 580	Materials Forensics and Degradation		

MSE 589	Solid State Solar and Thermal Energy Harvesting
MSE 702	Defects In Solids
MSE 703	Interaction of Electrons with Materials
MSE 704	Interaction of Photons with Materials
MSE 705	Mechanical Behavior Of Engineering Materials
MSE 706	Phase Transformations and Kinetics
MSE 708	Thermodynamics Of Materials
MSE 709	Metastable Materials: Processing, Structure, and Properties
MSE 710	Elements Of Crystallography and Diffraction
MSE 712	Scanning Electron Microscopy
MSE 715	Fundamentals Of Transmission Electron Microscopy
MSE 718	Advanced Transmission Electron Microscopy
MSE 721	Nanoscale Simulations and Modeling
MSE 723	Materials Informatics
MSE 731	Materials Processing by Deformation
MSE 741	Principles of Corrosion
MSE 751	Thin Film and Coating Science and Technology I
MSE 752	Thin Film and Coating Science and Technology II
MSE/NE 757	Radiation Effects on Materials
MSE 760	Materials Science in Processing of Semiconductor Devices
MSE 761	Polymer Blends and Alloys
MSE 763	Characterization Of Structure Of Fiber Forming Polymers
MSE 770	Defects, Diffusion and Ion Implantation In Semiconductors
MSE 771	Materials Science of Nanoelectronics
MSE 775	Structure of Semicrystalline Polymers
MSE 791	Nonferrous Alloys
MSE 795	Advanced Materials Experiments
Total Hours	**9**

Faculty

Professors

Harald Ade

Aram Amassian

David Aspnes

Salah M.A. Bedair

Donald Brenner

Ramon Collazo

Jerome Cuomo

Jan Genzer

Reza Ghiladi

Ola Harrysson

Douglas Irving

Jacob L. Jones

Djamel Kaoumi

Frederick Kish

Frederick Kish

Thomas LaBean

James D. Martin

John F. Murth

Korukonda Murty

Jagdish Narayan

Roger Jagdish Narayan

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Xiangwu Zhang

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Associate Professors

Veronica Augustyn

Rajeev Gupta

Jagannadham Kasichainula

Kinga Unocic

Raymond Unocic

Nina Wisinger

Assistant Professors

Bharat Gwalani

Timothy Horn

Yin Liu

Yin Liu

Martin Seifrid

Ruijuan Xu

Research Professor

Christopher Rock

Teaching Assistant Professor

Alexey Gulyuk

Adjunct Professors

Barry Farmer

John Prater

Adjunct Associate Professor

Charles Guarnieri

Practice/Research/Teaching Professor

Albert Kwansa

Emeritus Faculty

Charles Balik

Elizabeth Dickey

Carl C. Koch

Yuntian Zhu