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.

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.

Plan Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>MSE 500</td>
<td>Modern Concepts in Materials Science</td>
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Select a minimum of three courses from “MSE Courses” listed below

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<th>Code</th>
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<tr>
<td>MSE/NE 509</td>
<td>Nuclear Materials</td>
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<tr>
<td>MSE 540</td>
<td>Processing of Metallic Materials</td>
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<td>MSE 545</td>
<td>Ceramic Processing</td>
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<td>MSE 555</td>
<td>Polymer Technology and Engineering</td>
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<td>MSE 556</td>
<td>Composite Materials</td>
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<td>MSE 560</td>
<td>Microelectronic Materials Science and Technology</td>
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<td>MSE 561</td>
<td>Organic Chemistry Of Polymers</td>
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<td>MSE 565</td>
<td>Introduction to Nanomaterials</td>
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<td>MSE 566</td>
<td>Mechanical Properties of Nanostructured Materials</td>
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<tr>
<td>MSE 576</td>
<td>Technology Entrepreneurship and Commercialization I</td>
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<td>MSE 577</td>
<td>Technology Entrepreneurship and Commercialization II</td>
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<td>MSE 580</td>
<td>Materials Forensics and Degradation</td>
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<td>MSE 589</td>
<td>Solid State Solar and Thermal Energy Harvesting</td>
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<td>MSE 702</td>
<td>Defects In Solids</td>
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<td>MSE 703</td>
<td>Interaction of Electrons with Materials</td>
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<td>MSE 704</td>
<td>Interaction of Photons with Materials</td>
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<td>MSE 705</td>
<td>Mechanical Behavior Of Engineering Materials</td>
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<td>MSE 706</td>
<td>Phase Transformations and Kinetics</td>
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<td>MSE 708</td>
<td>Thermodynamics Of Materials</td>
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<td>MSE 709</td>
<td>Metastable Materials: Processing, Structure, and Properties</td>
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<td>MSE 710</td>
<td>Elements Of Crystallography and Diffraction</td>
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<td>MSE 712</td>
<td>Scanning Electron Microscopy</td>
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<td>MSE 715</td>
<td>Fundamentals Of Transmission Electron Microscopy</td>
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<td>MSE 718</td>
<td>Advanced Transmission Electron Microscopy</td>
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<td>MSE 721</td>
<td>Nanoscale Simulations and Modeling</td>
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<td>MSE 723</td>
<td>Materials Informatics</td>
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<td>MSE 731</td>
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<td>MSE 741</td>
<td>Principles of Corrosion</td>
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<td>MSE 751</td>
<td>Thin Film and Coating Science and Technology I</td>
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<td>Thin Film and Coating Science and Technology II</td>
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<td>MSE/NE 757</td>
<td>Radiation Effects on Materials</td>
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<td>MSE 760</td>
<td>Materials Science in Processing of Semiconductor Devices</td>
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<td>MSE 761</td>
<td>Polymer Blends and Alloys</td>
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<td>MSE 763</td>
<td>Characterization Of Structure Of Fiber Forming Polymers</td>
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<td>MSE 770</td>
<td>Defects, Diffusion and Ion Implantation In Semiconductors</td>
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<td>Materials Science of Nanoelectronics</td>
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<td>MSE 775</td>
<td>Structure of Semicrystalline Polymers</td>
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<td>MSE 791</td>
<td>Advanced Topics in Materials Science and Engineering</td>
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<tr>
<td>MSE 795</td>
<td>Advanced Materials Experiments</td>
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</table>

**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
- Thomas LaBean
- James D. Martin
- Korukonda Murty
- John F. Muth
- Jagdish Narayan
- Roger Jagdish Narayan
- Gregory N. Parsons
- Melissa Pasquinelli
- Zlatko Sitar
- Franky So
- Richard Spontak
- Martin Thuo
Joseph B. Tracy
Daryoosh Vashaee
Yaroslava Yingling
Xiangwu Zhang
Yong Zhu

Associate Professors
Veronica Augustyn
Rajeev Gupta
Jagannadham Kasichainula
Nina Wisinger

Assistant Professors
Bharat Gwalani
Timothy Horn
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

Emeritus Faculty
Charles Balik
Elizabeth Dickey