### COURSES

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE 530</td>
<td>Materials Science</td>
</tr>
<tr>
<td>MSE 533</td>
<td>Polymer &amp; Polymer Based Composites</td>
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<tr>
<td>MSE 535</td>
<td>Electronic and Photonic Materials</td>
</tr>
<tr>
<td>CHM 545</td>
<td>Mathematical Methods</td>
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<tr>
<td>MSE 575</td>
<td>Instrumentation for Materials Science</td>
</tr>
<tr>
<td>PHY 580</td>
<td>Quantum Mechanics for Materials Scientists</td>
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<tr>
<td>MSE 600</td>
<td>Materials Science Seminar I</td>
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<tr>
<td>MSE 600</td>
<td>Materials Science Seminar II</td>
</tr>
<tr>
<td>MSE 605</td>
<td>Ethics of Scientific Research and Professional Conduct</td>
</tr>
<tr>
<td>MSE 697</td>
<td>Research I</td>
</tr>
<tr>
<td>MSE 698</td>
<td>Research II (Ph. D. only)</td>
</tr>
<tr>
<td>MSE 699</td>
<td>Research III (Ph.D. only)</td>
</tr>
<tr>
<td>MSE 770</td>
<td>Doctoral Qualifying Examination</td>
</tr>
<tr>
<td>MSE 799</td>
<td>Master of Science Thesis Research</td>
</tr>
<tr>
<td>MSE 897</td>
<td>Doctoral Research I</td>
</tr>
<tr>
<td>MSE 899</td>
<td>Doctoral Research II</td>
</tr>
<tr>
<td>MSE 899</td>
<td>Doctoral Research III</td>
</tr>
<tr>
<td>MSE 900</td>
<td>Doctoral Thesis</td>
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### ELECTIVE COURSES

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>MSE 607</td>
<td>Materials for Nanotechnology</td>
</tr>
<tr>
<td>MSE 609</td>
<td>Introduction to Computational Materials</td>
</tr>
<tr>
<td>MSE 635</td>
<td>Optical Materials</td>
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<tr>
<td>EEN 650</td>
<td>Microelectromechanical Devices</td>
</tr>
<tr>
<td>PHY 653</td>
<td>Solid State Physics</td>
</tr>
<tr>
<td>MSE 640</td>
<td>Organic Optoelectronic Materials and Devices</td>
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<tr>
<td>EEN 663</td>
<td>Solid State Devices</td>
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<tr>
<td>PHY 675</td>
<td>Electricity and Magnetism</td>
</tr>
<tr>
<td>MSE 763</td>
<td>Materials and Devices for Solar Energy Conversion</td>
</tr>
<tr>
<td>MSE 704</td>
<td>Thin Film Phenomena</td>
</tr>
</tbody>
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### MATERIALS SCIENCE AND ENGINEERING PROGRAM

Center for Materials Research
Norfolk State University | 700 Park Ave., Norfolk, Virginia 23504
Phone: (757) 823-2381 | Fax: (757) 823-9054
https://www.nsu.edu/cmr
E-mail: cmr@nsu.edu

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### GRADUATE FACULTY

**Bahoura, M. J., Professor of Engineering**
- Renewable energy harvesting devices
- Energy storage devices
- Multifunctional thin films
- Nanomaterials
- High dielectric materials

**Black, Suely, Professor of Chemistry**
- Chemistry Education
- Materials Science and Engineering
- Graduate Education

**Bonner, Carl E, Professor of Chemistry**
- Nonlinear Optical Materials Characterization
- Electro-optic and thermo-optical Materials

**Noginov, Mikhail, Professor of Physics**
- Optical Spectroscopy
- Nonlinear optics
- Meta-materials
- Nano-plasmonics and lasers

**Noginova, Natalia, Professor of Physics**
- Magnetization dynamics at nanoscale
- Plasmonics and Spectroscopy
- Coupling of electric, magnetic and optical effects in nanostructured materials

**Rakhimov, Rahkim, Professor of Chemistry**
- Organic and organo-element free radicals
- Reduction/oxidation processes

**Ramash, Greendarajan, Professor of Biology**
- Director, Center for Materials Research
- Nano/bio-materials
- Bioelectronics
- Biosensors

**Song, Kyo, Professor of Engineering**
- Smart optical materials
- Wireless Power Transmission
- Microwave biomaterial interaction

**Sun, San-Shajing, Professor of Engineering**
- Graduate Program Coordinator, Center for Materials Research
- Organic, polymeric, hybrid or soft materials synthesis and characterization
- Electronic, Optoelectronic, and thermo-electric soft materials and thin film devices

**Temple, Doyle, Professor of Physics**
- Ultrafast Laser Spectroscopy
- Single Crystal Growth
- Plasmonic Sensors

**Yoon, Hargsoon, Associate Professor of Engineering**
- Biomedical nano-materials
- Neural sensing
- Nano-electronic materials and devices

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"I have developed transferable skills that I apply every day in my current role as a Materials Process Engineer. I worked across institutions, and on interdisciplinary teams. The program has been instrumental in my sensitivity to team dynamics, through workshops centered around emotional intelligence and relationship management. I now use these experiences to effectively contribute to project deliverables, that require input from various departments and specialties."

Monique Farrell, 2016 Ph.D. Materials Science and Engineering, Norfolk State University.

Currently a Materials Process Engineer III, Northrop Grumman

**MiNaC Class 100/1000 Cleanroom**
**NMR and ESR Labs**
**Thin Film Lab**
**Crystal Growth Lab**
**Materials Characterization Lab**
**Laser Spectroscopy Lab**
**Polymer Synthesis and Characterization Lab**
**Biomaterials and Toxicology Lab**

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**FINANCIAL ASSISTANCE**

**Teaching Assistantships** – provides a stipend, tuition and fees for the academic year. Duties include teaching, grading, laboratory instruction, and educational responsibilities.

**Research Assistantships** – covers the full calendar year and includes a stipend, tuition, and fees. Recipients work directly with faculty on research projects. Candidates are selected based on academic qualifications, research potential, and recommendations.

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**ADMISSION REQUIREMENTS**

Bachelor's or Master's degree in chemistry, physics, engineering, or related field from an accredited university.

English proficiency based on TOEFL scores or demonstrated working knowledge of the language.

GRE Scores (PhD program)

A completed application will include a statement of purpose, a resume, official transcripts from all schools attended, three or more letters of recommendation, and GRE scores (for Ph.D program applicants).