# Materials Science and Engineering, MS

Requirements for Students Matriculating in or before Academic Year 2021-2022. Learn more about Graduate College Academic Regulation 7.0 ([http://catalog.okstate.edu/graduate-college/#70](http://catalog.okstate.edu/graduate-college/#70)).

## Thesis Option
Total Hours: 30

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>MSE 5010</td>
<td>Materials Science and Engineering Seminar for Masters Students</td>
<td>0</td>
</tr>
<tr>
<td>MSE 5013</td>
<td>Advanced Thermodynamics of Materials</td>
<td>3</td>
</tr>
<tr>
<td>MSE 5023</td>
<td>Diffusion and Kinetics</td>
<td>3</td>
</tr>
<tr>
<td>MSE 5043</td>
<td>Advanced Materials Characterization</td>
<td>3</td>
</tr>
<tr>
<td>MSE 5093</td>
<td>Fundamentals of Materials Science</td>
<td>3</td>
</tr>
<tr>
<td>MSE 5193</td>
<td>Advanced Materials Processing</td>
<td>3</td>
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<td><strong>Hours Subtotal</strong></td>
<td><strong>15</strong></td>
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### Electives
Select 9 hours of the following:

- MSE 5030 Independent Study in Materials Science and Engineering 9
- MSE 5053 Smart Materials
- MSE 5063 Biomedical Materials
- MSE 5073 Tissue Engineering
- MSE 5093 Fundamentals of Materials Science 1
- MSE 5103 Electrical and Optical Properties of Ceramics
- MSE 5113 Diffraction in Materials or MAE 5113 Diffraction in Materials
- MSE 5123 Advanced Composites Manufacturing: Materials, Methods and Applications
- MSE 5133 Solid Oxide Fuel Cells
- MSE 5143 Batteries and Supercapacitors for Energy Storage
- MSE 5153 Crystal Physics and Materials Properties
- MSE 5173 Organic Electronic Materials and Devices
- MSE 5174 Fundamentals of Photovoltaics
- MSE 5193 Advanced Materials Processing 1
- MSE 5200 Applied Innovation I or EEE 5200 Special Topics in Entrepreneurship
- MSE 5223 Additive Manufacturing: Materials, Methods and Applications
- MSE 5553 Fatigue and Fracture
- MSE 5583 Corrosion Engineering or MAE 5583 Corrosion Engineering
- MSE 5693 Phase Transformations in Materials or MAE 5693 Phase Transformations in Materials
- MSE 5683 Thermodynamics and Thermostatistics of Materials

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<td><strong>Hours Subtotal</strong></td>
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### Thesis Research
6 hours of MSE 5000 6

**Total Hours** 30
With departmental approval, these courses may be substituted for a required MSE course.

**Non-Thesis Option**

**Total Hours: 35**

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<td>Advanced Materials Processing</td>
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**Hours Subtotal: 15**

**Electives**

Select 18 hours of the following: 18

**Materials Science and Engineering**

- MSE 5030 Independent Study in Materials Science and Engineering
- MSE 5053 Smart Materials
- MSE 5063 Biomedical Materials
- MSE 5073 Tissue Engineering
- MSE 5093 Fundamentals of Materials Science
- MSE 5103 Electrical and Optical Properties of Ceramics
- MSE 5113 Diffraction in Materials
- MSE 5123 Advanced Composites Manufacturing: Materials, Methods and Applications
- MSE 5133 Solid Oxide Fuel Cells
- MSE 5143 Batteries and Supercapacitors for Energy Storage
- MSE 5153 Crystal Physics and Materials Properties
- MSE 5173 Organic Electronic Materials and Devices
- MSE 5174 Fundamentals of Photovoltaics
- MSE 5193 Advanced Materials Processing
- MSE 5200 Applied Innovation I
- MSE 5223 Additive Manufacturing: Materials, Methods and Applications
- MSE 5553 Fatigue and Fracture
- MSE 5583 Corrosion Engineering
- MSE 5693 Phase Transformations in Materials
- MSE 5683 Thermodynamics and Thermostatistics of Materials
- MAE 5543 Modern Materials
- ECEN 5843 Microelectronic Fabrication
- ECEN 6843 Advanced Microelectronic Fabrication
- CHEM 5223 Polymer Chemistry
- CHEM 5263 Foundations of Inorganic Chemistry
- CHEM 5283 Solid State Chemistry
- CHEM 6113 Analytical Spectroscopy
- CHEM 5623 Quantum Chemistry I
- CHEM 5963 Advanced Inorganic Chemistry
- PHYS 5613 Quantum Mechanics I
- PHYS 5663 Solid State Physics I
- PHYS 5713 Solid State Physics II
- PHYS 5960 Problems in Chemical Physics
- PHYC 5643 Semiconductors I
- PHYC 6313 Quantum Mechanics II
- BIOM 6175 Molecular And Cellular Biology
- CHE 5283 Advanced Bioprocess Engineering
- CHE 5293 Advanced Biomedical Engineering
- ECEN 6843 Advanced Microelectronic Fabrication
- ECEN 6840 Photonics III: Microscopy I
- ECEN 6850 Photonics III: Microscopy II
- ECEN 6860 Photonics III: Microscopy III and Image Processing
- ECEN 6890 Photonics IV: Semiconductor Synthesis and Devices III
- MAE 5143 Tribology
- MAE 5243 Micro Flows
- MAE 5573 Continuum Mechanics
- MAE 5633 Advanced Thermal Energy Systems Analysis
- MAE 5993 Microstructural Mechanics
- MAE 6133 Surface Mechanics

**Independent Study**

2 hours required

**Hours Subtotal: 20**

**Total Hours: 35**

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1 With departmental approval, these courses may be substituted for a required MSE course.

**Graduate College Master’s Program Requirements**

Learn more about Graduate College 2021-2022 Master’s Degree Program Requirements (http://catalog.okstate.edu/graduate-college/). Check the General Graduate College academic regulations for minimal GPA, language proficiency and other general requirements.