Materials Science and Engineering - BS

Program Requirements

The freshman year is identical for degrees in aerospace engineering, architectural engineering, civil engineering, computer engineering, computer science, electrical engineering, electronic systems engineering technology, environmental engineering, industrial distribution, industrial engineering, interdisciplinary engineering, manufacturing and mechanical engineering technology, mechanical engineering, multidisciplinary engineering technology, nuclear engineering, ocean engineering, and petroleum engineering (Note: not all programs listed are offered in Qatar). The freshman year is slightly different for chemical engineering, biomedical engineering and materials science and engineering degrees in that students take CHEM 119 or CHEM 107/CHEM 117 and CHEM 120. Students pursuing degrees in biological and agricultural engineering should refer to the specific curriculum for this major. It is recognized that many students will change the sequence and number of courses taken in any semester. Deviations from the prescribed course sequence, however, should be made with care to ensure that prerequisites for all courses are met.

First Year

Fall Semester Credit Hours

CHEM 107 General Chemistry for Engineering Students 1,4 3

CHEM 117 General Chemistry for Engineering Students Laboratory 1,4 1

ENGL 103 or ENGL 104 Introduction to Rhetoric and Composition 1 3

ENGR 102 Engineering Lab I - Computation 1 2

MATH 151 Engineering Mathematics I 1,2 4

University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) 3 3

Semester Credit Hours 16

Spring Semester Credit Hours

ENGR 216/PHYS 216 Experimental Physics and Engineering Lab II - Mechanics 1 2

MATH 152 Engineering Mathematics II 1 4

PHYS 206 Newtonian Mechanics for Engineering and Science 1 3

University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) 3 3

Select one of the following: 3-4

CHEM 120 Fundamentals of Chemistry II 4

University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) 3,5 3

Semester Credit Hours 15-16

Total Semester Credit Hours 31-32

Second Year

Fall Semester Credit Hours

ENGR 217/PHYS 217 Experimental Physics and Engineering Lab III - Electricity and Magnetism 1 2

MATH 251 Engineering Mathematics III 1 3

MSEN 201 Fundamentals of Materials Science and Engineering 1 3

MSEN 205 Materials in Society 1 2

PHYS 207 Electricity and Magnetism for Engineering and Science 1 3

University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) 3 3

Semester Credit Hours 16

Spring Semester Credit Hours

COMM 205 or ENGL 210 Communication for Technical Professions 1 or Technical and Business Writing 1 3

MSEN 210 Thermodynamics of Materials 1 3

MSEN 250 Soft Matter 1 3

MSEN 260 Structure of Materials 1 3

MSEN 281 Materials Science and Engineering Seminar 1 1

MSEN 301 Unified Materials Lab I 1,5 3

Semester Credit Hours 16
Third Year

Fall

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 308</td>
<td>Differential Equations ¹</td>
<td>3</td>
</tr>
<tr>
<td>MSEN 302</td>
<td>Unified Materials Lab II ¹,5</td>
<td>3</td>
</tr>
<tr>
<td>MSEN 305</td>
<td>Kinetics of Materials ¹</td>
<td>3</td>
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<tr>
<td>MSEN 320</td>
<td>Deformation and Failure Mechanisms in</td>
<td>3</td>
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<tr>
<td></td>
<td>Engineering Materials ¹</td>
<td></td>
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<tr>
<td>MSEN 380</td>
<td>Communicating Materials Science and</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Engineering ¹,5</td>
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<tr>
<td>MSEN 399</td>
<td>High Impact Professional Development</td>
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</table>

University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ³ 3

Total Semester Credit Hours 16

Spring

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MSEN 325</td>
<td>Properties of Functional Materials ¹</td>
<td>3</td>
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<tr>
<td>MSEN 330</td>
<td>Numerical Methods for Materials Scientists and</td>
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<tr>
<td></td>
<td>Engineers ¹</td>
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<td>MSEN 360</td>
<td>Materials Characterization ¹</td>
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<tr>
<td>MSEN 400</td>
<td>Design and Analysis of Materials Experiments ¹</td>
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University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ³ 3

Technical elective ¹,6 3

Total Semester Credit Hours 18

Fourth Year

Fall

<table>
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<tbody>
<tr>
<td>MSEN 401</td>
<td>Materials Research and Design I ¹</td>
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</tr>
<tr>
<td>MSEN 410</td>
<td>Materials Processing ¹</td>
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University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ³ 3

Specialty elective ⁷ 3

Technical elective ¹,6 3

Total Semester Credit Hours 15

Spring

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSEN 402</td>
<td>Materials Research and Design II ¹</td>
<td>3</td>
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</table>

University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) ³ 3

Specialty elective ⁷ 6

Technical elective ¹,6 3

Total Semester Credit Hours 15

Total Semester Credit Hours 96

⁵ This is a writing intensive course.