### Chemistry Course Requirements – Materials Science & Engineering Emphasis (2016-17)

The Materials Science & Engineering emphasis is for students who are interested in learning how to develop new materials in chemistry, and explore the MSE department. Students who choose this emphasis may work for a company to design new products or go to graduate school in chemistry or MSE.

**1st Year Fall**
- MATH 1210: Calc I (4 cr.) F, S, U QR
- CHEM 1210: Gen Chem I (4 cr.) F, S, U SF
- CHEM 1215: Chem I Lab (1 cr.) F, S

**1st Year Spring**
- MATH 1220: Calc II (4 cr.) F, S, U QR
- CHEM 1220: Gen Chem II (4 cr.) F, S, U SF

**2nd Year Fall**
- MATH 2210: Calc III (3 cr.) F, S, U QR
- CHEM 2310: Org Chem I (4 cr.) F, S, U
- CHEM 2315: Org I Lab (2 cr.) F, S, U

**2nd Year Spring**
- MATH 2250: ODE + LinAlg (4 cr.) F, S, U QR
- PHYS 2210: Physics I (4 cr.) F, S, U SF
- PHYS 2215: Physics I Lab (1 cr.) F, S

**3rd Year Fall**
- CHEM 2320: Org Chem II (4 cr.) F, S, U
- CHEM 2325: Org II Lab (2 cr.) F, S, U
- CHEM 3060: Quantum (4 cr.) F, S QI
- CHEM 5710: Adv Org Lab (2 cr. 1st half F)

**3rd Year Spring**
- CHEM 3070: Thermo (4 cr.) F, S, U QI
- CHEM 5720: Adv Phys Lab (2 cr. 2nd half S)
- CHEM 3000: Quant Analys (4 cr.) F, S, U CW, QI

**4th Year Fall**
- CHEM 3100: Inorganic (5 cr.) F, S
- CHEM 5730: Adv Inorg Lab (2 cr. 2nd half F)
- CHEM 4800: Research (2 credits)

**4th Year Spring**
- CHEM 5700: Adv Ana Lab (2 cr. 1st half S CW)
- MSE XXXX: Mat Sci Elective (2-4 cr. F, S)

---

1) Can take whichever calculus sequence is appropriate, including AP Calculus (MATH 1250 & 1260) or Engineering Calculus (MATH 1310 & 1320). Must finish the sequence that was started.
2) MATH 2270 + 2280 are more rigorous, but will take 2 semesters to complete.
3) Honors versions are PHYS 3210 + 3220. This sequence starts in Spring.
4) Honors versions of General Chemistry are CHEM 1211 + 1221. Sequence starts in the Fall. Must apply to be in the class.
5) Honors versions of Organic Chemistry are CHEM 2311 + 2321. Sequence starts in the Fall. Must apply to be in the class.
6) **= Only 2 upper division labs required**
7) Need at least 15 credits in Materials Science & Engineering. Check DARS to see accepted courses. CHEM 4800 (research) or CHEM 4999 (Honors Thesis) can waive 2 credits.

---

**Recommended Co-requisite**
- F = Fall

**Recommended Pre-requisite**
- S = Spring

**Pre-requisite**
- U = Summer
The Materials Science & Engineering emphasis is for students who are interested in learning how to develop new materials in chemistry, and explore the MSE department. Students who choose this emphasis may work for a company to design new products or go to graduate school in chemistry or MSE.

### Material Science & Engineering Emphasis

<table>
<thead>
<tr>
<th>Done?</th>
<th>Depart.</th>
<th>Number</th>
<th>Course Name</th>
<th>Credit Hours</th>
<th>Gen Ed/Bach Req</th>
<th>Prerequisites</th>
<th>Taught</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MATH</td>
<td>1210</td>
<td>Calculus I</td>
<td>4</td>
<td>QR</td>
<td>MATH 1060 or 1080</td>
<td>x x x</td>
</tr>
<tr>
<td></td>
<td>MATH</td>
<td>1220</td>
<td>Calculus II</td>
<td>4</td>
<td>QR</td>
<td>MATH 1210</td>
<td>x x x</td>
</tr>
<tr>
<td></td>
<td>MATH</td>
<td>2210</td>
<td>Calculus III</td>
<td>4</td>
<td>QR</td>
<td>MATH 1220</td>
<td>x x x</td>
</tr>
<tr>
<td></td>
<td>MATH</td>
<td>2250</td>
<td>ODEs and Linear Algebra</td>
<td>4</td>
<td>QR</td>
<td>MATH 2250</td>
<td>x x x</td>
</tr>
<tr>
<td></td>
<td>PHYS</td>
<td>2210</td>
<td>Physics for Sci &amp; Eng I</td>
<td>4</td>
<td>SF</td>
<td>MATH 1210</td>
<td>x x x</td>
</tr>
<tr>
<td></td>
<td>PHYS</td>
<td>2215</td>
<td>Physics Lab for Sci &amp; Eng I</td>
<td>1</td>
<td></td>
<td>MATH 1210</td>
<td>x x x</td>
</tr>
<tr>
<td></td>
<td>PHYS</td>
<td>2220</td>
<td>Physics for Sci &amp; Eng II</td>
<td>4</td>
<td>SF</td>
<td>MATH 1220 + PHYS 2210</td>
<td>x x x</td>
</tr>
<tr>
<td></td>
<td>PHYS</td>
<td>2225</td>
<td>Physics Lab for Sci &amp; Eng II</td>
<td>1</td>
<td></td>
<td>MATH 1220 + PHYS 2210</td>
<td>x x x</td>
</tr>
<tr>
<td></td>
<td>CHEM</td>
<td>2000/4000</td>
<td>Undergrad Seminar</td>
<td>1</td>
<td></td>
<td></td>
<td>x x x</td>
</tr>
<tr>
<td></td>
<td>CHEM</td>
<td>1210 + 1215</td>
<td>General Chemistry I + Lab</td>
<td>4 + 1</td>
<td>SF</td>
<td>MATH 1050</td>
<td>x x x</td>
</tr>
<tr>
<td></td>
<td>CHEM</td>
<td>1220 + 1225</td>
<td>General Chemistry II + Lab</td>
<td>4 + 1</td>
<td>SF</td>
<td>CHEM 1210 + 1215</td>
<td>x x x</td>
</tr>
<tr>
<td></td>
<td>CHEM</td>
<td>2310 + 2315</td>
<td>Organic Chemistry I³ + Lab</td>
<td>4 + 2</td>
<td></td>
<td>CHEM 1220 + 1225</td>
<td>x x x</td>
</tr>
<tr>
<td></td>
<td>CHEM</td>
<td>2320 + 2325</td>
<td>Organic Chemistry II³ + Lab</td>
<td>4 + 2</td>
<td></td>
<td>CHEM 2310 + 2315</td>
<td>x x x</td>
</tr>
<tr>
<td></td>
<td>CHEM</td>
<td>3000</td>
<td>Quantitative Analysis</td>
<td>4</td>
<td>QI, CW</td>
<td>CHEM 1220</td>
<td>x x x</td>
</tr>
<tr>
<td></td>
<td>CHEM</td>
<td>3060</td>
<td>Quantum Chemistry &amp; Spect</td>
<td>4</td>
<td>QI</td>
<td>CHEM 1220</td>
<td>MATH 2210 + PHYS 220</td>
</tr>
<tr>
<td></td>
<td>CHEM</td>
<td>3070</td>
<td>Thermodynamics &amp; Kinetics</td>
<td>4</td>
<td>QI</td>
<td>CHEM 1220</td>
<td>MATH 2210 + PHYS 220</td>
</tr>
<tr>
<td></td>
<td>CHEM</td>
<td>3100</td>
<td>Inorganic Chemistry</td>
<td>5</td>
<td></td>
<td>CHEM 1220</td>
<td>CHEM 2320 + 3060</td>
</tr>
</tbody>
</table>

### ADVANCED LABS - Choose 2

<table>
<thead>
<tr>
<th>Depart.</th>
<th>Number</th>
<th>Course Name</th>
<th>Credit Hours</th>
<th>Gen Ed/Bach Req</th>
<th>Prerequisites</th>
<th>Taught</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE</td>
<td>5700</td>
<td>Analytical Chemistry Lab</td>
<td>2</td>
<td>CW</td>
<td>CHEM 3000</td>
<td>1st</td>
</tr>
<tr>
<td>MSE</td>
<td>5710</td>
<td>Organic Chemistry Lab</td>
<td>2</td>
<td></td>
<td>CHEM 2320</td>
<td>1st</td>
</tr>
<tr>
<td>MSE</td>
<td>5720</td>
<td>Physical Chemistry Lab</td>
<td>2</td>
<td></td>
<td>CHEM 3060, 3070</td>
<td>2nd</td>
</tr>
<tr>
<td>MSE</td>
<td>5730</td>
<td>Inorganic Chemistry Lab</td>
<td>2</td>
<td></td>
<td>CHEM 3100</td>
<td>2nd</td>
</tr>
<tr>
<td>MSE</td>
<td>3200</td>
<td>Radiochemistry</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### MSE ELECTIVES

- Need 15 credit hours of approved electives (see list of approved courses and DARS)

**Notes:**
- Can take whichever calculus sequence is appropriate, including AP Calculus (MATH 1250 & 1260) or Engineering Calculus (MATH 1310 & 1320). Must finish the sequence that was started.
- MATH 2270 + 2280 are more rigorous, but will take 2 semesters to complete.
- Honors versions are PHYS 3210 + 3220. This sequence starts in Spring.
- Honors versions of General Chemistry are CHEM 1211 + 1212. Sequence starts in the Fall. Must apply to be in the class.
- Honors versions of Organic Chemistry are CHEM 2311 + 2321. Sequence starts in the Fall. Must apply to be in the class.
- CHEM 4800 (research) or CHEM 4999 (Honors Thesis) can waive 2 credits
- Visit material science & engineering website to get permission code for these classes.

---

Done? | Depart. | Number | Course Name | Credit Hours | Gen Ed/Bach Req | Prerequisites | Taught |
-------|---------|--------|-------------|--------------|-----------------|---------------|--------|

---