# Material Science Engineering

## Graduation Requirements

University of Washington

https://mse.washington.edu

**MSE**

**Material Science Engineering**

Graduation Requirements

**ENGRUD Requirement Sheet – Key**

◆ = Placement Requirements

## Placement Periods

Placement 1 = July 1 at end of first year
Placement 2 = January 15 of second year

## Mathematics (24cr)

- ◆ MATH 124, 125, 126- Calculus with Analytical Geometry I, II, III (15cr) or honors equivalents
- MATH 307 - Introduction to Differential Equations (3cr) [pr: MATH 125]
- MATH 308 - Matrix Algebra with Applications (3cr) [pr: MATH 126]
- One course from the following:
  - IND E 315; STAT 390; MATH 309; MATH 324.

## Sciences (31cr – 35cr)

- ◆ CHEM 142 - General Chemistry (5cr)
- ◆ CHEM 152 - General Chemistry (5cr) [pr: CHEM 142, CHEM 143 or CHEM 145]
- ◆ PHYS 121 - Mechanics (5cr) [pr: MATH 124 or MATH 134; PHY]
- PHYS 122 - Electromagnetism (5cr) [pr: MATH 125 or MATH 134; PHYS 121]
- PHYS 123 - Waves (5cr) [pr: MATH 126 or MATH 134; PHYS 122]
- Two courses from the following:
  - BIOL 180 (5cr), 200, 220; CHEM 162, 223, 237, 238, 239, 335, 336, 337; PHYS 224, 225, 226, 227, 228

## Engineering General Education Requirements (32cr)

- Written and Oral Communication (8cr):
  - ◆ English Composition (5cr)
- ENGR 231 – Introduction to Technical Communication (3cr)
- Areas of Knowledge:
  - Visual, Literary & Performing Arts-VLPA (10cr)
  - Individuals & Society-I&S (10cr)
- VLPA or I&S (4cr)
- Diversity - DIV (3cr) – (may overlap with VLPA/I&S course)

## Engineering Fundamentals (24cr)

- AA 210 - Engineering Statics (4cr) [pr: MATH 126; PHYS 121]
- CEE 220 - Intro to Mechanics of Materials (4cr) [pr: AA 210]
- MSE 170 – Fundamentals of Materials Science (4cr) [pr: CHEM 142]
- AMATH 301-Beginning Scientific Computing (4cr) [pr: either MATH 125, Q SCI 292, or MATH 135) OR CSE 142-Computer Programming I (4cr)
- Two of the following: AA 260, EE 215, IND E 250, NME 220, ME 123; NME 220 NOT possible here for NME Option students

## Departmental Core (53cr)

- MSE 311 – Integrated Undergraduate Lab. I (3cr)
- MSE 312 – Integrated Undergraduate Lab. II (3cr)
- MSE 313 – Integrated Undergraduate Lab III (3cr)
- MSE 310 – Introduction to MSE (3cr)
- MSE 321 – Thermodynamics and Phase Equilibrium (4cr)
- MSE 331 – Crystallography and Structure (3cr)
- MSE 322 – Kinetics and Microstructural Evolution (4cr)
- MSE 342 – Materials Processing I (3cr)
- MSE 351 – Electronic Properties of Materials (3cr)
- MSE 399 – Undergraduate Research Seminar (1cr)
- MSE 333 – Materials Characterization (3cr)
- MSE 352 – Functional Properties of Materials I (3cr)
- MSE 362 – Mechanical Behavior of Materials I (3cr)
- MSE 499 – Senior Project (4cr)
- MSE 442 – Materials Processing II (3cr)
- MSE 491 – Design in Materials Engineering I (2cr)
- MSE 431 – Failure Analysis and Durability of Materials (3cr)
- MSE 492 – Design in Materials Engineering II (2cr)

## MSE Technical Electives (8-16cr)

See MSE website for list of courses to choose from

## Total credits required for graduation: 180cr

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**Student completing the Nanoscience and Molecular Engineering (NME) degree option must enroll in NME 220+NME 221 Spring sophomore year, NME 321 Spring junior year, and NME 421 Spring senior year**

Updated January 2020
This is a sample four-year plan for ENGRUD students. It is intended to provide a framework for ENGRUD students to reference as they create their own individual academic plan.

Courses required to request placement for ENGRUD students: MATH 124, MATH 125, MATH 126; CHEM 142; CHEM 152; PHYS 121; 5 credits of English Composition. All placed students must also complete MATH 307, PHYS 122, AMATH 301 (or CSE 142), and MSE 170 before Autumn quarter Junior year to fulfill MSE Continuation Policy requirements.

<table>
<thead>
<tr>
<th>Freshman</th>
<th>Autumn Quarter</th>
<th>Cr</th>
<th>Winter Quarter</th>
<th>Cr</th>
<th>Spring Quarter</th>
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<tr>
<td></td>
<td>◆ MATH 124 – Calculus with Analytical Geometry I</td>
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<td>◆ MATH 125 – Calculus with Analytical Geometry II</td>
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<td>◆ MATH 126 – Calculus with Analytical Geometry III</td>
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<tr>
<td></td>
<td>◆ CHEM 142 – General Chemistry</td>
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<td>◆ CHEM 152 – General Chemistry</td>
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<td>◆ PHYS 121 – Mechanics</td>
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<td>◆ English Composition</td>
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<th>Sophomore</th>
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<tr>
<td></td>
<td>MATH 307 – Differential Equations</td>
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<td>PHYS 122 – Electromagnetism</td>
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<td>PHYS 123 – Waves</td>
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<td>VLPA/I&amp;S</td>
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<td>AA 210 – Engineering Statics</td>
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<td>MSE 313 – Integrated Undergrad Lab III</td>
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<td>MSE 312 – Integrated Undergrad Lab II *</td>
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<td>MSE 431 – Failure Analysis</td>
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<td>MSE 499 – Senior Project</td>
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<td>MSE 491 – Materials Design I</td>
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<td>MSE Technical Elective</td>
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*ENGRUD students who Place in Placement Period 1 take the MSE Undergraduate lab series (MSE 311, 312, 313) sophomore year; everyone else takes the lab series junior year.

- All MSE courses on the schedule, other than MSE 170 & Technical Electives, must be completed in the order provided.
- ◆ = Placement Requirements

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Updated January 2020