

This resource is for ENGRUD students who entered the UW in AUT23 or later.

# MSE

**Materials Science & Engineering  
Graduation Requirements**  
University of Washington  
<https://mse.washington.edu>

**ENGRUD Requirement Sheet – Key:**

◆ = Placement Requirements;

★ = Pick *one to satisfy placement*

**Placement:** July 1 at the end of the first year

◆ **E-FIG: ENGR 101 and GEN ST 199**

### **Mathematics (24cr)**

◆ **MATH 124, 125, 126 - Calc w Analytic Geom. I-III (15cr)**

MATH 207 - Intro to Differential Equations (3cr)  
[pr: MATH 125]

MATH 208 - Matrix Algebra with Applications (3cr)  
[pr: MATH 126]

One of the following: IND E 315 (3cr); MATH 209 (3cr), MATH 224 (3cr); MATH 318 (3cr); STAT 390 (4cr)

### **Sciences (31-35cr)**

◆ **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]

★ **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 this list (see "Natural Science Reqmts"):  
<https://mse.washington.edu/current/undergrad/courses>

### **Engineering General Education Requirements (32cr)**

#### ***Written and Oral Communication:***

◆ **English Composition (5cr)**

ENGR 231 - Intro to Communication (3cr)

#### ***Areas of Inquiry:***

Arts & Humanities – A&H (10cr)

Social Sciences - SSc (10cr)

Additional A&H or SSc (4cr)

Diversity - DIV (5cr) (may overlap with A&H or SSc)

### **Engineering Fundamentals (24cr)**

AA 210 - Engineering Statics (4cr)  
[pr: MATH 126, PHYS 121]

CEE 220 - Intro to Mechanics of Materials (4cr)  
[pr: A A 210]

★ **MSE 170 - Fundamentals of Materials Science (4cr)**  
[pr: CHEM 142]

★ **CSE 122 - Computer Programming II (4cr)**  
OR ★ **AMATH 301**

8 credits from this list (see "Engineering Fund. Reqmts"):  
<https://mse.washington.edu/current/undergrad/courses>

### **Departmental Core (54cr)**

MSE 310 - Intro to MSE (3cr)

MSE 311 - Integrated Undergraduate Lab I (3cr)

MSE 312 - Integrated Undergraduate Lab II (3cr)

MSE 313 - Integrated Undergraduate Lab III (3cr)

MSE 321 - Thermodynamics and Phase Equilibrium (4cr)

MSE 322 - Kinetics and Microstructural Evolution (4cr)

MSE 331 - Crystallography and Structure (3cr)

MSE 333 - Materials Characterization (3cr)

MSE 342 - Materials Processing I (3cr)

MSE 351 - Electronic Properties of Materials (3cr)

MSE 352 - Functional Properties of Materials I (3cr)

MSE 362 - Mechanical Behavior of Materials I (3cr)

MSE 399 - Undergraduate Research Seminar (1cr)

MSE 431 - Failure Analysis and Durability of Materials (3cr)

MSE 442 - Materials Processing II (3cr)

MSE 491 - Design in Materials Engineering I (2cr)

MSE 492 - Design in Materials Engineering II (3cr)

MSE 499 - Senior Project (4cr)

### **Technical Electives (15cr)**

See MSE website for list of courses to choose from.

**Total credits required for graduation: 180cr**

### **Note for students completing the NME degree option**

You must complete the course as outlined below:

Spring of soph. year: NME 220 (4)

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**Materials Science & Engineering**  
**Sample Curriculum**  
 University of Washington  
<https://mse.washington.edu>

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This is a sample four-year plan for ENGRUD students that prepares them to be able to request placement at the end of the first year. 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: **ENGR 101; MATH 124, MATH 125, MATH 126; CHEM 142; PHYS 121; English Composition**; plus **one course** from the list of [common placement requirements](#).

### First Year

<u>Autumn Quarter</u>	<u>cr</u>	<u>Winter Quarter</u>	<u>cr</u>	<u>Spring Quarter</u>	<u>cr</u>
◆ MATH 124 - Calc w Analytic Geom I	5	◆ MATH 125 - Calc w Analytic Geom II	5	◆ MATH 126 - Calc w Analytic Geom III	5
◆ CHEM 142 - General Chemistry	5	★ CHEM 152 - General Chemistry	5	◆ PHYS 121 - Mechanics	5
◆ E-FIG; ENGR 101 & GEN ST 199	5	◆ English Composition	5	★ MSE 170 - Fundamentals of Materials Science	4
A&H / SSc	3				
Qtr. Total:	<b>15</b>	Qtr. Total:	<b>15</b>	Qtr. Total:	<b>14</b>

### Second Year

<u>Autumn Quarter</u>	<u>cr</u>	<u>Winter Quarter</u>	<u>cr</u>	<u>Spring Quarter</u>	<u>cr</u>
MSE 311 - Integrated UG Lab I (W)	3	MSE 312 - Integrated UG Lab II (W)	3	MSE 313 - Integrated UG Lab III (W)	3
PHYS 122 - Electromagnetism	5	PHYS 123 - Waves	5	MATH 207 - Differential Equations	3
AMATH 301 - Scientific Computing	4	AA 210 - Engineering Statics	4	CEE 220 - Mechanics of Materials	4
OR CSE 122 - Computer Programming II		A&H / SSc / DIV	5	A&H / SSc	5
A&H / SSc	4				
Qtr. Total:	<b>16</b>	Qtr. Total:	<b>17</b>	Qtr. Total:	<b>15</b>

### Third Year

<u>Autumn Quarter</u>	<u>cr</u>	<u>Winter Quarter</u>	<u>cr</u>	<u>Spring Quarter</u>	<u>cr</u>
MATH 208 – Matrix Algebra	3	MSE 322 - Kinetics & Microstructural Evo	3	MSE 499 - Senior Project	1
ENGR 231 - Intro to Technical Comm	3	MSE 342 - Materials Processing I	4	MSE 333 - Materials Characterization	3
MSE 321 - Thermodynamics & Phase Equilibrium	3	MSE 351 - Electron Properties of Materials	3	MSE 352 - Functional Prop of Materials I	3
	4	MSE 310 - Intro to MSE	3	MSE 362 - Mech Behavior of Materials I	3
MSE 331 - Crystallography & Structure		Science Elective	4	Math Elective	3
MSE 399 - UG Research Seminar	1				
Qtr. Total:	<b>16</b>	Qtr. Total:	<b>14</b>	Qtr. Total:	<b>13</b>

### Fourth Year

<u>Autumn Quarter</u>	<u>cr</u>	<u>Winter Quarter</u>	<u>cr</u>	<u>Spring Quarter</u>	<u>cr</u>
MSE 442 - Materials Processing II	3	MSE 431 - Failure Analysis	3	MSE 492 - Materials Design II	3
MSE 499 - Senior Project	2-3	MSE 499 - Senior Project	0-1	MSE Technical Elective	3
MSE Technical Elective	3	MSE Technical Elective	3	Science Elective	3
MSE Technical Elective	3	Engineering Elective	4	A&H / SSc	5
Engineering Elective	4	MSE 491 - Materials Design I	2		
		MSE Technical Elective	3		
Qtr. Total:	<b>15-16</b>	Qtr. Total:	<b>15-16</b>	Qtr. Total:	<b>14</b>

◆ = Placement Requirements

★ = Pick **one** to satisfy placement requirements

*All MSE courses (except for 170 and the Technical Electives) must be completed in the order outlined above.*

*Honors or accelerated sequences of chemistry, math and physics will satisfy the placement requirements.  
 AMATH 351 is an acceptable alternative to MATH 207.*

Updated September 2023