



Department of  
**MATERIALS SCIENCE  
AND ENGINEERING**

**Curriculum for the BS in Materials Science and Engineering  
2022-2023 Undergraduate Catalog**

**Freshman Year**

**First Semester**

4 – CH 1010 General Chemistry  
3 – ENGL 1030 Composition and Rhetoric  
3 – ENGR 1020 – Engineering Disciplines & Skills<sup>2</sup>  
4 – MATH 1060 – Calculus of One Variable I  
3 - Arts and Humanities Requirement<sup>1</sup> *or*  
3 – Social Science Requirement<sup>1</sup>

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**Second Semester**

4 – CH 1020 General Chemistry  
3 – ENGR 1410 Programming & Problem Solving  
4 – MATH 1080 Calculus of One Variable II  
3 – PHYS 1220 Physics with Calculus I  
3 - Arts and Humanities Requirement<sup>1</sup> *or*  
3 – Social Science Requirement<sup>1</sup>

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**Sophomore Year**

**First Semester**

3 – CH 2230 Organic Chemistry  
1 – CH 2270 Organic Chemistry Laboratory  
4 – MATH 2060 Calculus of Several Variables  
3 – MSE 2100 Introduction to Materials Science  
3 – PHYS 2210 Physics with Calculus II  
3 – Arts and Humanities Requirement<sup>1</sup> *or*  
3 – Social Science Requirement<sup>1</sup>

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**Second Semester**

3 – CE 2010 Statics  
3 – CH 2240 Organic Chemistry  
1 – CH 2280 Organic Chemistry Laboratory  
2 – ENGR 2080 Engineering Graphics and Machine Design *or*  
2 – ECE 2070 Basic Electrical Engineering  
4 – MATH 2080 Intro to Ordinary Differential Equations  
3– MSE 3100 Introduction to Metals and Ceramics\*\*

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**Junior Year**

**First Semester**

2 – MSE 3010 Materials Synthesis and Fabrication Laboratory \*  
3 – MSE 3260 Thermodynamics of Materials \*  
3 – MSE 4150 Polymer Science & Engineering  
1 – MSE 3450 Practice of Materials Engineering\*  
1 – MSE 3910 Undergraduate Research Fundamentals  
3 – STAT 4110 Statistical Methods for Process Dev and Control  
3 – Arts and Humanities Requirement<sup>1</sup> *or*  
3 – Social Science Requirement<sup>1</sup>

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**Second Semester**

2 – MSE 3020 Materials Characterization Laboratory\*\*  
3 – MSE 3190 Materials Processing \*\*  
3 – MSE 3270 Transport Phenomena\*\*  
3 – MSE 4020 Fundamentals of Solid State Materials\*\*  
3 – MSE 4220 Mechanical Behavior of Materials\*\*  
2 – MSE 4910 - Undergraduate Research

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**Senior Year**

**First Semester**

3 – COMM 2500 Public Speaking  
2– ENGR 2080 Engineering Graphics and Machine Design *or*  
2 – ECE 2070 Basic Electrical Engineering  
3 – MSE 4070 Senior Capstone Design\*  
3 – Tech Requirement<sup>3</sup>  
3– Tech Requirement<sup>3</sup>

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**Second Semester**

3 – Arts and Humanities Requirement<sup>1</sup> *or*  
3 – Social Science Requirement<sup>1</sup> *or*  
3 – Global Challenge Requirement<sup>2</sup>  
3 - IE 3840 Engineering Economic Analysis  
3 – Tech Requirement<sup>3</sup>  
3– Tech Requirement<sup>3</sup>  
3 – Tech Requirement<sup>3</sup>

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\*Offered only Fall terms    \*\*Offered only Spring terms    **128 Total Semester Hours**

<sup>1</sup> See General Education requirements. Three General Education credits must also satisfy the SC REACH Act Requirement.

<sup>2</sup> Six credits must also satisfy the Global Challenges requirements. Three of the six credits must be at the 3000-4000 level.

ENGR 1020 transferred in from another school does NOT meet the Global Challenges requirement.

<sup>3</sup> Students must complete 15 credits of technical electives, all of which must be at least 3-credit courses. Three of the courses must be 4000-level MSE courses. See catalog for complete details.

## Technical Requirements

The Materials Science and Engineering curriculum allows students flexibility in selecting courses and planning their future careers.

Students must complete 15 credits of technical electives, all of which must be at least three-credit courses. Three of the courses must be 4000-level MSE courses.

Students may select from:

MSE 4130, MSE 4160, MSE 4170, MSE 4240, MSE 4280, MSE 4320, MSE 4330, MSE 4340, MSE 4560, MSE 4570, MSE 4580, MSE 4610, MSE 4900, and MSE 4920

3000- or 4000-level courses in:

AMFG, AUE, BCHM, BE, BIOE, BIOL, BMOL, CE, CH, CHE, ECE, EES, GEOL, IE, MATH, ME, MICR, PHYS, PKSC or STAT,

**EXCLUDING** the following:

BCHM: 4900, 4910, 4920, 4930

BE: 3000, 3010, 3200, 3700, 3990, 4000, 4140, 4150, 4170, 4210, 4990

BIOE: 3000, 4000, 4150, 4500, 4510, 4600, 4610, 4900, 4910

BIOL: 3080, 3940, 4260, 4470, 4500, 4600, 4620, 4710, 4760, 4820, 4880, 4890, 4910, 4920, 4930, 4940, 4950, 4960

CE: 3530, 3870, 3880, 3890, 3990, 4590, 4870, 4880, 4890, 4900, 4910, 4990

CH: 3410, 3990, 4000, 4430, 4440, 4500, 4990

CHE: 3000, 3190, 3950, 3990, 4450, 4910, 4950, 4970, 4990

ECE: 3000, 3990, 4910, 4920, 4930, 4990

EES: 3000, 3010, 4000, 4500, 4510, 4750, 4900, 4950

GEOL: 3910, 3920, 4110, 4910, 4920

IE: 3000, 3600, 3610, 3680, 3840, 4000, 4040, 4690, 4910

MATH 3020, 4820, 4910, 4990

ME: 3000, 3900, 4000, 4020, 4150, 4900, 4930

MICR: 3940, 4190, 4910, 4920, 4930, 4940, 4950

PHYS: 3000, 3990, 4010, 4750, 4990

PKSC: 4030, 4210, 4220, 4950, 4960, 4980, 4990

STAT: 3090, 3300