

B.S. in Materials Science and Engineering

Catalog Year 2023–24

Below is the *advised sequence* of courses for this degree program as of 7/12/2022.

Official degree requirements and course prerequisites are found in the University General Catalog; prerequisites are subject to change.

Course Number and Title	Units	Prerequisites/Enrollment Requirements
1st Semester		
MATH 122 A/B or MATH 125 Calculus I with Applications	5/3	Appropriate Math Placement
*CHEM 151 Chemical Thinking I or CHEM 161/163	4	Appropriate Math Placement
ENGL 101 or 107 or 109H First-Year Composition	3	
ENGR 102A/B Introduction to Engineering or ENGR 102	3	<u>ENGR102A</u> : MATH 112; <u>ENGR102B</u> : Concurrently enrolled or completion of MATH 122B or 125; FR & SOPH Status
UNIV 101 Intro to the General Education Experience	1	
Semester Total	14/16	
2nd Semester		
MATH 129 Calculus II	3	MATH 122B or 125 with C or better
MSE 110 Solid State Chemistry	4	CHEM 151 or 161/163
*PHYS 141 Introductory Mechanics or PHYS 161H	4	MATH 122B or 125 or Appropriate Math Placement Level
ENGL 102 or 108 First-Year Composition	3	ENGL 101 or ENGL 107
General Education: Exploring Perspectives (Humanist)	3	
Semester Total	17	
3rd Semester		
MSE 222 Introduction to Materials Science and Engineering I – Fall Only	3	CHEM 151; MSE 110 or CHEM 152; MATH 122B or MATH 125
MATH 223 Vector Calculus	4	MATH 129 with C or better
PHYS 241 Introductory Electricity and Magnetism or PHYS 261H	4	For PHYS 241 or 261H: PHYS 141 or 161H; MATH 129 or Appropriate Math Placement Level
MSE 280 Introduction to Computer Methods in MSE – Fall Only	2	MATH 129; MSE 110 or Consult with Department
General Education: Exploring Perspectives (Social Scientist)	3	
Semester Total	16	
4th Semester		
MSE 223R Introduction to Materials Science and Engineering II - Spring Only	3	MSE 222 or 331R
MSE 223L Materials Processing Laboratory - Spring Only	2	
MSE 345 Thermodynamics - Spring Only	4	MATH 129, CHEM 151; MSE 110 or CHEM 152 or Department Consent, and Adv Stdg.
MATH 254 Intro to Ordinary Differential Equations	3	MATH 129 or 223 with C or better
†General Education: Building Connections	3	
Semester Total	15	

*Each of the following foundational science courses satisfies the requirements for General Education: Exploring Perspectives (Natural Scientist): CHEM 151 or 152 or 161 or 162; or PHYS 141 or 161H.

Advanced Standing is required for 300- and 400-level engineering courses (see your academic advisor for details).

Course Number and Title	Units	Comments
5th Semester		
MSE Technical Elective	3	Consult major advisor for course approval
Math Elective	3	Consult major advisor for course approval
MSE 370 Mechanical Behavior of Materials – Fall Only	3	
ECE 207 Elements of Electrical Engineering	3	
MSE 365 Physical Properties of Materials – Fall Only	3	
Semester Total	15	
6th Semester		
MSE 360L Materials Lab – Spring Only	1	
MSE Technical Elective	3	Consult major advisor for course approval
MSE 480 Advanced Characterization Methods in MSE – Spring Only	3	
MSE 415 Transport Phenomena & Kinetics in Materials Processing – Spring Only	4	
Advanced Science Elective	3	Consult major advisor for course approval
General Education: Exploring Perspectives (Artist)	3	
Semester Total	17	
7th Semester		
ENGR 498A Interdisciplinary Capstone (Fall Only) or MSE 498 Senior Capstone	3	Senior Status
MSE Technical Elective	3	Consult major advisor for course approval
Technical Elective - **CE 301 – Engineering Communications	3	
Technical Elective	3	Consult major advisor for course approval
Semester Total	12	
8th Semester		
ENGR 498B Interdisciplinary Capstone (Spring Only) or MSE 498 Senior Capstone	3	Senior Status
MSE Technical Elective	3	Consult major advisor for course approval
Technical Elective	3	Consult major advisor for course approval
Technical Elective	3	Depends on selection of General Education course, Consult major advisor for course approval
†General Education: Building Connections	3	
UNIV 301 General Education Portfolio	1	
Semester Total	16	

†Students should work closely with their academic advisor to select General Education: Building Connections courses; some course work in the major, such as some Technical Elective courses, may also fulfill General Education: Building Connections requirements.

**CE 301 will fulfill a General Education Building Connections course; provisionally approved Fall 2022.