

Materials Science and Engineering Major

Degree Type: B.S.

Minimum Degree Credits: 120

University Degree Requirements

For complete details on these and other university degree requirements, refer to the Degree and Graduation Requirements (<https://catalog.ndsu.edu/academic-policies/undergraduate-policies/degree-and-graduation/>) section in the University Catalog.

1. Minimum of 120 semester credits (some programs may exceed this minimum).
2. Complete the University General Education requirements.
3. Minimum institutional GPA of 2.00 based on work taken at NDSU.
4. Minimum of 30 credits in residence at NDSU.
5. Minimum of 36 upper level credits (courses numbered 300 or higher).
6. Students with transfer credit must meet the NDSU 30 credits in residence (#4). Of these 30 credits in residence, a minimum of 15 credits must be in courses numbered 300 or above, and 15 credits must be in the student's declared major curricula.

University General Education Requirements

A list of university approved general education courses along with the administrative policies governing the requirement and the categories is available

Code	Title	Credits
Category C: Communication		12
Category R: Quantitative Reasoning		3
Category S: Science and Technology		10
Category A: Humanities and Fine Arts		6
Category B: Social and Behavioral Sciences		6
Category W: Wellness		2
Category D: Cultural Diversity		
Category G: Global Perspectives		
Category L: Digital Literacy		
Total Credits		39

Major Requirements

Code	Title	Credits
Materials Science and Engineering Core Requirements		
MSE 111	Introduction to Materials Science and Engineering ¹	1
MSE 211	Fundamentals of Materials Science and Engineering ¹	3
MSE 250	Thermodynamics	3
MSE 321	Kinetics and Phase Transformation in Materials	3
MSE 323	Structure and Characterization of Materials	3
MSE 323L	Structure and Characterization of Materials laboratory	2
MSE 325	Course MSE 325 Not Found	
MSE 325L	Course MSE 325L Not Found	
MSE 335	Electronic Optical and Magnetic Properties of Materials	3
MSE 445	Computational materials Science	3
MSE 465	Materials Selection and Design	3
MSE 489	Senior Design	3
Mathematics Requirement		
MATH 128	Introduction to Linear Algebra	1
MATH 165	Calculus I	4
MATH 166	Calculus II	4

MATH 259	Multivariate Calculus	3
MATH 266	Introduction to Differential Equations	3
Other Major Required Courses		
CHEM 121	General Chemistry I	3
CHEM 121L	General Chemistry I Laboratory	1
CHEM 122L	General Chemistry II Laboratory	1
CHEM 122	General Chemistry II	3
CHEM 240	Survey of Organic Chemistry	3
CSCI 227	Computing Fundamentals in Python I	3
ENGL 321	Writing in the Technical Professions	3
ENGR 327	Ethics, Engineering, and Technology	3
IMSE 433	Additive Manufacturing	3
IMSE 460	Evaluation of Engineering Data	3
ME 223	Mechanics of Materials	3
ME 474	Mechanics of Composite Materials	3
PHYS 251	University Physics I	4
PHYS 251L	University Physics I Laboratory	1
PHYS 252	University Physics II	4
PHYS 252L	University Physics II Laboratory	1
PHYS 350	Modern Physics	3
PHYS 462	Thermal and Statistical Physics	3
Technical Electives		
Choose 18 credit hours of electives from the four focus areas below. You can specialize in one area or mix and match across multiple areas.		18
Total Credits		108

¹ No grades less than C accepted in MSE 111 and MSE 211.

Technical Electives - Select 18 credits from any of the Focus Areas

Code	Title	Credits
Focus Area: Biomaterials		
ECE 415	Elements of Photonics	3
ECE 485	Biomedical Engineering	3
ME 480	Biofluid Mechanics	3
ME 468	Introduction to Biomechanics	3
Focus Area: Composites and Sustainable Materials		
CE 486	Nanotechnology and Nanomaterials	3
or ME 486	Nanotechnology and Nanomaterials	
ME 436	Biopolymers and Biocomposites	3
CE 471	Environmental Nanotechnology	3
Focus Area: Computational Materials Science		
ME 477	ME Finite Element Analysis	3
PHYS 481	Materials Physics	3
Focus Area: Polymers		
CPM 473	Polymer Synthesis	3
CPM 474	Applied Polymer Science	3

ME 473	Engineering with Polymeric Materials	3
ME 436	Biopolymers and Biocomposites	3