MATERIALS SCIENCE AND ENGINEERING (BSE)

Bachelor of Science in Engineering

Materials Science and Engineering majors are required to complete 127 total credits, including the following:

Course	Title	Credits
Required Courses		
CHEM 1128Q	General Chemistry II	4
or CHEM 1148Q	Honors General Chemistry II	
ENGR 1166	Foundations of Engineering	3
MATH 2110Q & MATH 2410Q	Multivariable Calculus and Elementary Differential Equations	7
CE 2110	Applied Mechanics I	3
MSE Core		
MSE 2001	Introduction to Structure, Properties, and Processing of Materials I	3
MSE 2002	Introduction to Structure, Properties, and Processing of Materials II	3
MSE 3001	Applied Thermodynamics of Materials	4
MSE 3002	Transport Phenomena in Materials Processing	3
MSE 3003	Phase Transformation Kinetics and Applications	3
MSE 3004	Mechanical Behavior of Materials	3
MSE 4001	Electrical and Magnetic Properties of Materials	3
MSE 4003	Materials Characterization	3
MSE 4004	Thermal/Mechanical Processing of Materials	3
MSE Labs		
MSE 2053	Materials Characterization and Processing Laboratory	2
MSE 3055	Materials Processing and Microstructures Laboratory	2
MSE 3056	Mechanical Behavior Laboratory	2
MSE 4901W	Capstone Design Project I	3
MSE 4902W	Capstone Design Project II	3
Professional Requirement Courses		
Professional Electives (p. 1)		12
Technical Electives		
Technical Electives (p. 1)		9
Free Elective		3
Total Credits		**81**

Professional Electives

Recommended professional elective courses: 12 credits from:

Course	Title	Credits
Any 3000 or 4000 level MSE elective course		3
BME 3700	Biomaterials	4
or BME 4701	Biomedical Materials and Implants	
CHEG 3156	Polymeric Materials	3
or ME 3217	Metal Cutting Principles	
or ME 3228	Introduction to Fatigue in Mechanical Design	
Select up to three credits each of:		
MSE 4097	Undergraduate Research in Materials Science and Engineering	1-3
or MSE 4996	Thesis Research in Materials Science and Engineering	
MSE 4099	Independent Study in Materials Science and Engineering	1-3
Total Credits		**12-16**

Students may take multiple instances of MSE 4095 Special Topics in Materials Science and Engineering or MSE 4098 Variable Topics in Materials Science and Engineering, which all may count as Professional Electives in MSE, provided each instance covers a different topic. Students with GPA of 3.2 or greater may elect letter-grade graduate courses as Professional Electives. Any substitutions must be approved by the Director of Undergraduate Studies and the College of Engineering Undergraduate Dean.

Technical Elective Requirement

Nine credits, selected from all 2000, 3000, and 4000 courses in the basic sciences, mathematics, and in any engineering discipline other than Materials Science and Engineering are accepted as technical electives. At least three credits must be selected from the basic sciences or mathematics: Mathematics (MATH), Biological Sciences (BIOL), Chemistry (CHEM), Molecular and Cell Biology (MCB), Physics (PHYS), and Statistics (STAT). Courses typically selected to satisfy the technical elective requirement are detailed in the *Materials Science and Engineering Guide to Course Selection at* mse.engr.uconn.edu/curriculum-and-course-guide *(*http://mse.engr.uconn.edu/curriculum-and-course-guide/*).*

Free Elective

Three credits, selected from courses at any level in any discipline at student's discretion.

Concentration in Naval Science and Technology

The concentration in Naval Science and Technology is designed to expose students to engineering concepts and topics of importance to the Navy and industries that support naval science and technology. It is focused on facilitating interactions between students and naval professionals as well as hands-on and experiential activities related to senior design projects or independent study projects that have naval science and technology connections.

To complete this concentration, students must complete nine credits of Naval Science and Technology Coursework topics, distributed as follows:

Course	Title	Credits
ENGR 3109	Navy STEM Professional Development Seminar (at least 3 credits)	3
Select six credits from the following:		6
MSE 4095	Special Topics in Materials Science and Engineering	
MSE 4901W	Capstone Design Project I	
MSE 4902W	Capstone Design Project II	

MSE 4097	Undergraduate Research in Materials Science and Engineering	
Total Credits		**9**

Students electing to complete the concentration must do so in their primary major, and as such select elective coursework from their primary discipline. Students electing to use their Senior Design course sequence must have their project topic approved by both their departmental senior design coordinator and either the director of the Navy STEM Program or the Associate Dean for Undergraduate Education.

Students electing to use Special Topics courses or Independent Study/Research courses must have the course or research topic approved by both their department and either the director of the Navy STEM Program or the Associate Dean for Undergraduate Education. Other courses relevant to naval science and technology may be considered for the concentration by petition to the director of the Navy STEM Program or the Associate Dean of Undergraduate Education. Students may not apply courses used in this concentration to fulfill requirements for other concentrations or minors.

The concentration in Naval Science and Technology is restricted to U.S. citizens.

Program Educational Objectives (PEOs)

Program Educational Objective 1

Within three to five years after graduation, in their professional careers and/or graduate programs, our alumni/ae will have progressed in responsible professional positions, pursued continual learning, and/or will have attained or will be successfully moving toward attaining post-graduate degrees.

Program Educational Objective 2

Within three to five years after graduation, in their professional careers and/or graduate programs, our alumni/ae will have earned recognition for applying and continually expanding special, in-depth competencies in materials design, selection, processing, characterization, modeling and simulations.

Program Educational Objective 3

Within three to five years after graduation, in their professional careers and/or graduate programs, our alumni/ae will have earned recognition for applying and continually expanding professional skills of critical and cooperative thinking, communication, leadership, teamwork, including in multidisciplinary settings, innovation, and project management.

Program Educational Objective 4

Within three to five years after graduation, in their professional careers and/or graduate programs, our alumni/ae will have become engaged with and will be contributing to professional societies. Our alums will also begin to identify and promote opportunities for collaboration with the MSE department, faculty, students, and other alumni/ae.

The Materials Science and Engineering program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (http://www.abet.org).