MATERIALS SCIENCE AND ENGINEERING - BS

Program Requirements

The freshman year is identical for degrees in aerospace engineering, architectural engineering, civil engineering, computer engineering, computer science, electrical engineering, electronic systems engineering technology, environmental engineering, industrial distribution, industrial engineering, interdisciplinary engineering, manufacturing and mechanical engineering technology, mechanical engineering, multidisciplinary engineering technology, nuclear engineering, ocean engineering, and petroleum engineering (Note: not all programs listed are offered in Qatar). The freshman year is slightly different for chemical engineering, biomedical engineering and materials science and engineering degrees in that students take CHEM 119 or CHEM 107/CHEM 117 and CHEM 120.

Students pursuing degrees in biological and agricultural engineering should refer to the specific curriculum for this major. It is recognized that many students will change the sequence and number of courses taken in any semester. Deviations from the prescribed course sequence, however, should be made with care to ensure that prerequisites for all courses are met.

First Year

Fall		Semester Credit Hours
CHEM 107	General Chemistry for Engineering Students [1,4]	3
CHEM 117	General Chemistry for Engineering Students Laboratory [1,4]	1
ENGL 103 or ENGL 104	Introduction to Rhetoric and Composition [1] or Composition and Rhetoric	3
ENGR 102	Engineering Lab I - Computation [1]	2
MATH 151	Engineering Mathematics I [1,2]	4
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [3]		3
	Semester Credit Hours	16
Spring		
ENGR 216/ PHYS 216	Experimental Physics and Engineering Lab II - Mechanics [1]	2
MATH 152	Engineering Mathematics II [1]	4
PHYS 206	Newtonian Mechanics for Engineering and Science [1]	3
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [3]		3
Select one of the following:		3-4
CHEM 120	Fundamentals of Chemistry II [4]	
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [3,5]		
	Semester Credit Hours	15-16
	Total Semester Credit Hours	31-32

1. A grade of C or better is required.
2. Entering students will be given a math placement exam. Test results will be used in selecting the appropriate starting course which may be at a higher or lower level.
3. Of the 21 hours shown as University Core Curriculum electives, 3 must be from creative arts, 3 from social and behavioral sciences (see IDIS curriculum for more information), 3 from language, philosophy and culture (see CVEN, EVEN and PETE curriculum for more information), 6 from American history and 6 from government/ political science. The required 3 hours of international and cultural diversity and 3 hours of cultural discourse may be met by courses satisfying the creative arts, social and behavioral sciences, language, philosophy and culture, and American history requirements if they are also on the approved list of international and cultural diversity (http://catalog.tamu.edu/undergraduate/general-information/degree-information/international-cultural-diversity-requirements/) courses and cultural discourse (http://catalog.tamu.edu/undergraduate/general-information/degree-information/cultural-discourse-requirements/) courses.
4. BMEN, CHEN and MSEN require 8 hours of freshman chemistry, which may be satisfied by CHEM 119 or CHEM 107/CHEM 117 and CHEM 120; Credit by Examination (CBE) for CHEM 119 plus CHEM 120; or 8 hours of CBE for CHEM 119 and CHEM 120. BMEN, CHEN and MSEN should take CHEM 120 second semester freshman year. CHEM 120 will substitute for CHEM 107/CHEM 117.
5. For BS-PETE, allocate 3 hours to core communications course (ENGL 210, COMM 203, COMM 205, or COMM 243) and/or 3 hours to UCC elective. For BS-MEEN, allocate 3 hours to core communications course (ENGL 203, ENGL 210, or COMM 205) and/or 3 hours to UCC elective.

Second Year

Fall		Semester Credit Hours
ENGR 217/ PHYS 217	Experimental Physics and Engineering Lab III - Electricity and Magnetism [1]	2
MATH 251	Engineering Mathematics III [1]	3
MSEN 201	Fundamentals of Materials Science and Engineering [1]	3
MSEN 205	Materials in Society [1]	2
PHYS 207	Electricity and Magnetism for Engineering and Science [1]	3
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [3]		3
	Semester Credit Hours	16
Spring		
COMM 205 or ENGL 210	Communication for Technical Professions [1] or Technical and Business Writing	3
MSEN 210	Thermodynamics of Materials [1]	3
MSEN 250	Soft Matter [1]	3
MSEN 260	Structure of Materials [1]	3
MSEN 281	Materials Science and Engineering Seminar [1]	1
MSEN 301	Unified Materials Lab I [1,5]	3
	Semester Credit Hours	16

Third Year		
Fall		
MATH 308	Differential Equations [1]	3
MSEN 302	Unified Materials Lab II [1,5]	3
MSEN 305	Kinetics of Materials [1]	3
MSEN 320	Deformation and Failure Mechanisms in Engineering Materials [1]	3
MSEN 380	Communicating Materials Science and Engineering [1,5]	1
MSEN 399	High Impact Professional Development	0
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [3]		3
	Semester Credit Hours	16
Spring		
MSEN 325	Properties of Functional Materials [1]	3
MSEN 330	Numerical Methods for Materials Scientists and Engineers [1]	3
MSEN 360	Materials Characterization [1]	3
MSEN 400	Design and Analysis of Materials Experiments [1]	3
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [3]		3
Technical elective [1,6]		3
	Semester Credit Hours	18
Fourth Year		
Fall		
MSEN 401	Materials Research and Design I [1]	3
MSEN 410	Materials Processing [1]	3
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [3]		3
Specialty elective [7]		3
Technical elective [1, 6]		3
	Semester Credit Hours	15
Spring		
MSEN 402	Materials Research and Design II [1]	3
University Core Curriculum (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/) [3]		3
Specialty elective [7]		6
Technical elective [1,6]		3
	Semester Credit Hours	15
	Total Semester Credit Hours	96

[5] This is a writing intensive course.

[6] Select from any MSEN 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/msen/) course not used elsewhere. Students may use up to 3 hours each of MSEN 491 , MSEN 485, and MSEN 484.

[7] Select in consultation with advisor from MSEN 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/msen/); AERO 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/aero/); BAEN 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/baen/); BMEN 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/bmen/); CHEN 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/chen/); CVEN 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/cven/); CSCE 110, CSCE 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/csce/); ECEN 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/ecen/); ENGR 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/engr/); ISEN 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/isen/); MEEN 221, MEEN 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/meen/); NUEN 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/nuen/); BIOL 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/biol/); CHEM 220, CHEM 227, CHEM 228, CHEM 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/chem/); MATH 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/math/); PHYS 222, PHYS 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/phys/); STAT 211, STAT 212, STAT 300-499 (http://catalog.tamu.edu/undergraduate/course-descriptions/stat/); MGMT 309; MKTG 409; FINC 409. All non-MSEN specialty electives must be approved by the Undergraduate Advising Office, on the basis of satisfying one or more of the MSEN BSE program outcomes (e.g., integrating scientific and engineering principles across disciplines).