

BACHELOR OF SCIENCE IN MATERIALS SCIENCE AND ENGINEERING 2017-2018 DEGREE REQUIREMENTS – 132 Credit Hours			
FIRST YEAR - FALL	PREREQUISITES	COURSE HRS	TOTAL SEM HRS
Math 1551 – Differential Calculus		2	
Math 1553 – Linear Algebra		2	
Chem 1211K - Chemical Principles I		4	
CS 1371 - Computing for Engineers		3	
Engl 1101 - English Composition I		3	
MSE 1111 - Intro to MSE (1) <b>or</b> APPH 1040 – Sci. Found. of Health/APPH 1050 – Sci. of Phys. Activ & Health - Wellness (2)		1/2	15/16
FIRST YEAR - SPRING	PREREQUISITES	COURSE HRS	
Math 1552 – Integral Calculus	Math 1550 or Math 1551 or Math 1501 or Math 15X1	4	
Phys 2211 - General Physics I	MATH 1501 or MATH 1511	4	
Chem 1212K - Chemical Principles II	Chem 1310 or Chem 1211K	4	
Engl 1102 - English Composition II	Engl 1101	3	
MSE 1111 - Intro to MSE (1) <b>or</b> APPH 1040 – Sci. Found. of Health/APPH 1050 – Sci. of Phys. Activ & Health - Wellness (2)		1/2	16/17
SECOND YEAR - FALL	PREREQUISITES	COURSE HRS	
Chem 1315 - Survey of Organic Chemistry	Chem 1310 or Chem 1211K	3	
COE 2001 - Statics	(MATH 1502 or 1512 or 15X2 or 1552) and (PHYS 2211 or PHYS 2231)	2	
Math 2551 – Multivariable Calculus	MATH 1502 or MATH 1555 or MATH 1504 or MATH 1512 or (MATH 1552 and MATH 1553) or (MATH 1552 and MATH 1554) or (MATH 1552 and MATH 1564) or (MATH 1552 and MATH 1522) or (MATH 15X2 and MATH 1522)	4	
Phys 2212 - General Physics II	Phys 2211 or PHYS 2231	4	
MSE 2001 - Introduction to Engineering Materials	Chem 1310 or Chem 1211K	3	16
SECOND YEAR - SPRING	PREREQUISITES	COURSE HRS	
COE 3001 - Mechanics of Deformable Bodies	COE 2001 and (Math 2403 or Math 24X3 or Math 2413 or MATH 2552 or MATH 2562)	3	
Math 2552 – Differential Equations	MATH 1502 or MATH 1555 or MATH 1504 or MATH 1512 or (MATH 1552 and MATH 1553) or (MATH 1552 and MATH 1554) or (MATH 1552 and MATH 1564) or (MATH 1552 and MATH 1522) or (MATH 15X2 and MATH 1522)	4	
Econ 2100/05/06 - Econ. Analysis and Policy Problems - Prin.		3	
MSE 2021 - Materials Characterization	MSE 2001	4	
MSE Concentration Specific		3	17
THIRD YEAR - FALL	PREREQUISITES	COURSE HRS	
ECE 3710 - Circuits and Electronics	PHYS 2212	2	
SS - Social Science Elective <sup># =</sup>		3	
HUM - Humanities Elective <sup># =</sup>		3	
MSE 3001 – Thermodynamics	MSE 2001 and MATH 2403/2413/24X3/2552/2602	3	
MSE 3025 - Statistics and Numerical Methods	MSE 2001, CS 1371 and (MATH 2403 or MATH 2552)	3	
MSE 3210 - Transport Phenomena (X)	(MATH 2401 or MATH 2411 or MATH 2551) and (MATH 2403 or MATH 2413 or MATH 2552) and MSE 3001 (with concurrency)	3	17
THIRD YEAR - SPRING	PREREQUISITES	COURSE HRS	
ECE 3741 - Electrical Engineering Lab	ECE 3710	1	
ISyE 3025 - Essentials of Engineering Economy	ECON 2100/5/6	1	
MSE 3002 - Structural Transformations	MSE 3001 and MSE 3210	3	
MSE 3005 - Mechanical Behavior of Materials	MSE 2001 and COE 3001	3	
MSE 3015 - Electrical, Optical, and Magnetic Properties	MSE 2001 and, PHYS 2212	3	
MSE 3021 - Materials Laboratory I	MSE 2021	2	
MSE 4775 - Polymer Science & Engineering I	(Chem 2312 or Chem 1315 ) and( PTFE 2200 or MSE 2001) and (Chem 3411 or ME 3322 or MSE 3001)	3	16
FOURTH YEAR - FALL	PREREQUISITES	COURSE HRS	
MSE 4022 - Materials Laboratory II	MSE 2021	2	
MSE 4410 - Capstone Engineering Design I	Senior Standing	3	
MSE Concentration Specific		3	
MSE Concentration Specific		3	
Humanities Elective <sup># =</sup>		3	
Free Elective		2	16
FOURTH YEAR - SPRING	PREREQUISITES	COURSE HRS	
MSE 4420 - Capstone Engineering Design II	MSE 4410	3	
MSE Concentration Specific		3	
MSE Concentration Specific		3	
SS – Social Science Elective <sup># =</sup>		3	
SS – Hist/Pol Sci Requirement (US Perspectives, Constitution & History) <sup>+</sup>		3	
Free Elective		3	18

**MSE Curriculum Concentration Courses**

**Polymer & Fiber Materials Concentration**

**Required Courses**

**Prerequisites**

- MSE 3225 Rheology CHBE 3200 or MSE 3210
- MSE 3230 Polymer & Fiber Processing MSE 3225 and MSE 4775
- MSE 4140 Polymer Physics MSE 3001 and MSE 4775

**Optional Courses (students choose two of the following 3 hour courses)**

- ME 1770 Introduction to Engineering Graphics None
- MSE 3220 Operations & Management Methods MSE 2001 and MSE 3210 and MSE 4775
- MSE 4025 Fiber Product Manufacturing MSE 4775
- MSE 4230 Industrial Controls in Manufacturing ECE 3710
- MSE 4335 Soft Nano-Bio Materials MSE 2001
- MSE 4791 Mechanical Behavior of Composites MSE 3005
- MSE 4793 Composite Materials & Processing CHEM 1310 or CHEM 1211K and PHYS 2212

**Structural and Functional Materials Concentration**

**Required Courses**

**Prerequisites**

- MSE 4002 Ceramic Materials MSE 3002
- MSE 4006 Processing & Applications of Engineering Alloys MSE 2021 and MSE 3002
- MSE 4010 Environmental Degradation MSE 2001

**Optional Courses (students choose two of the following 3 hour courses)**

- ME 1770 Introduction to Engineering Graphics None
- MSE 3220 Operations & Management Methods MSE 2001 and MSE 3210 and MSE 4775
- MSE 3225 Rheology CHBE 3200 or MSE 3210
- MSE 3230 Polymer & Fiber Processing MSE 3225 and MSE 4775
- MSE 4004 Materials in Electronic Applications MSE 3015
- MSE 4025 Fiber Product Manufacturing MSE 4775
- MSE 4140 Polymer Physics MSE 3001 and MSE 4775
- MSE 4230 Industrial Controls in Manufacturing ECE 3710
- MSE 4330 Nanomaterials & Structures MSE 2001
- MSE 4335 Soft Nano-Bio Materials MSE 2001
- MSE 4751 Introduction to Biomaterials MSE 2001
- MSE 4754 Electronics Packaging Assembly, Reliability, Thermal Management & Test ECE 3040 or ECE 3710
- MSE 4755 Electronic Packaging Substrate Fabrication MATH 2401 and MATH 2403 and CHEM 1211K and PHYS 2212
- MSE 4791 Mechanical Behavior of Composites MSE 3005
- MSE 4793 Composite Materials & Processing CHEM 1310 or CHEM 1211K and PHYS 2212

**Biomaterials Concentration**

**Required Courses**

**Prerequisites**

- BIOL 1510 Biological Principles (\*4 hrs) None
- MSE 4002 Ceramic Materials MSE 3002
- MSE 4006 Processing & Applications of Engineering Alloys MSE 2001 and MSE 3002
- MSE 4751 Introduction to Biomaterials MSE 2001

**Optional Courses (students choose one of the following 3 hour courses)**

- ME 1770 Introduction to Engineering Graphics None
- MSE 3220 Operations & Management Methods MSE 2001 and MSE 3210 and MSE 4775
- MSE 3225 Rheology CHBE 3200 or MSE 3210
- MSE 3230 Polymer & Fiber Processing MSE 3225 and MSE 4775
- MSE 4004 Materials in Electronic Applications MSE 3015
- MSE 4025 Fiber Product Manufacturing MSE 4775
- MSE 4140 Polymer Physics MSE 3001 and MSE 4775
- MSE 4230 Industrial Controls in Manufacturing ECE 3710
- MSE 4330 Nanomaterials & Structures MSE 2001
- MSE 4335 Soft Nano-Bio Materials MSE 2001
- MSE 4751 Introduction to Biomaterials MSE 2001
- MSE 4754 Electronics Packaging Assembly, Reliability, Thermal Management & Test ECE 3040 or ECE 3710
- MSE 4755 Electronic Packaging Substrate Fabrication MATH 2401 and MATH 2403 and CHEM 1211K and PHYS 2212
- MSE 4791 Mechanical Behavior of Composites MSE 3005
- MSE 4793 Composite Materials & Processing CHEM 1310 or CHEM 1211K and PHYS 2212

\*Because of this 4 hour required course, the Biomaterials Concentration requires only 4 hours of Free Elective credit

+Hist/Pol Sci Requirement (Constitution & History). Choose from: HIST 2111 or HIST 2112 or INTA 1200 or POL 1101 or PUBP 3000

=Ethics -The following courses listed carry the MSE specific Ethics attribute. Choose from: CS 4001 or CS 4002 or HTS 2084 or HTS 3032 or INTA 2030 or LMC 3318 or PHIL 3105 or PST 3105 or PHIL 3109 or PST 3109 or PHIL 3127 or PST 3127 or PHIL 4176 or PST 4176 or PUBP 3600 (1) The courses listed for Ethics may also meet Core Area C (Humanities) or Core Area E (Social Sciences). Students may use these courses to meet areas (C and Ethics), or (E and Ethics) at the same time. Check Institute Catalog for attributes.