MATERIALS SCIENCE & ENGINEERING

2022 – 2023 Curriculum

***Fall Only** ****Spring Only**

Student: _____
Date: _____
CUID: _____
Advisor: _____

FRESHMAN YEAR							
Term Info		**Cr**	**Course**	**Term Info**		**Cr**	**Course**
		4	CH 1010 & 1011 General Chemistry			4	CH 1020 & 1021 General Chemistry
		3	ENGL 1030 & 1031 Composition and Rhetoric			3	ENGR 1410 & 1411 Programming and Problem Solving[4]
		3	ENGR 1020 & 1021 Engineering Disciplines and Skills[1]			4	MATH 1080 Calculus of One Variable II
		4	MATH 1060 Calculus of One Variable I[2]			3	PHYS 1220 Physics with Calculus I
		3	Arts & Humanities *OR* Social Science Req[3]			3	Arts & Humanities *OR* Social Science Req[3]
		17				**17**	
SOPHOMORE YEAR							
Term Info		**Cr**	**Course**	**Term Info**		**Cr**	**Course**
		3	CH 2230 Organic Chemistry			3	CE 2010 Statics
		1	CH 2270 Organic Chemistry Lab.			3	CH 2240 Organic Chemistry
		4	MATH 2060 Calculus of Several Variables			1	CH 2280 Organic Chemistry Lab.
		3	MSE 2100 Introduction to Materials Science			2	ENGR 2080 & 2081 Engr. Graphics & Machine Design *OR* ECE 2070 Basic Electrical Engineering
		3	PHYS 2210 Physics with Calculus II			4	MATH 2080 Int. to Ordinary Differential Eqn.
		3	Arts & Humanities *OR* Social Science Requirement[3]			3	MSE 3100 Introduction to Metals and Ceramics**
		17				**16**	
JUNIOR YEAR							
Term Info		**Cr**	**Course**	**Term Info**		**Cr**	**Course**
		2	MSE 3010 Materials Synthesis and Fabrication Lab*			3	IE 3840 Engineering Economic Analysis
		3	MSE 3260 Thermodynamics of Materials*			2	MSE 3020 Materials Characterization Lab**
		3	MSE 4150 Polymer Science and Engineering			3	MSE 3190 Materials Processing I**
		1	MSE 3450 Practice of Materials Engineering *			3	MSE 3270 Transport Phenomena**
		1	MSE 3910 Undergraduate Research Fundamentals			3	MSE 4020 Solid State Materials**
		3	STAT 4110 Statistical Methods for Process Development and Control			3	MSE 4220 Mechanical Behavior of Materials**
		3	Arts & Humanities *OR* Social Science Requirement[3]				
		16				**17**	
SENIOR YEAR							
Term Info		**Cr**	**Course**	**Term Info**		**Cr**	**Course**
		3	COMM 2500 & 2501 Public Speaking			3	MSE 4070 Senior Capstone Design
		2	ECE 2070 Basic Electrical Engineering *OR* ENGR 2080 & 2081 Engr. Graphics & Machine Design			3	Arts & Humanities *OR* Social Science Requirement[3]
		2	MSE 4910 Undergraduate Research			3	Technical Requirement[5]
		3	Technical Requirement[5]			3	Technical Requirement[5]
		3	Technical Requirement[5]			3	Technical Requirement[5]
		13				**15**	

128 Total Semester Hours

GENERAL EDUCATION REQUIREMENTS

Literature	Non-Literature	Social Science (SC REACH Act, if required)	Social Science (from a different department)	Global Challenges (ENGR 1020 at Clemson or another course)	Global Challenges -3000 or 4000 level Or if already met with Tech Requirement, then need Dept Arts & Humanities/Social Sci Req

CHANGE OF MAJOR REQUIREMENTS: C grade or higher in each class and a 2.0 Clemson cumulative GPA

CH 1010	ENGL 1030	ENGR 1020	ENGR 1410	MATH 1060	PHYS 1220

Students should always refer to the Academic Catalog for course descriptions and for course pre-requisites, corequisites, and concurrent enrollment requirements. Academic Catalog can be found here: https://www.clemson.edu/registrar/academic-catalogs/. Advisors will assist students in scheduling courses to fulfill the requirements of the degree program; nevertheless, it is the responsibility of the student to fulfill the relevant requirements of the degree.

Footnotes

[1] The combination of ENGR 1050 and ENGR 1060 or the combination of ENGR 1510 and ENGR 1520 may be substituted for ENGR 1020.

[2] Depending on a student's Clemson Mathematics Placement Test score, MATH 1040 and MATH 1070 may be substituted for MATH 1060; or the student may be required to take MATH 1050 before enrolling in MATH 1060.

[3] See General Education requirements. Three General Education credits must also satisfy the South Carolina REACH Act Requirement. See the South Carolina REACH Act Requirement in the Academic Regulations section.

[4] One of the following may be substituted for ENGR 1410: (1) the combination of ENGR 1070, ENGR 1080, and ENGR 1090; or (2) the combination of CHE 1300 and ENGR 1070; or (3) ENGR 1640.

[5] Students must complete 15 credits of technical electives, all of which must be at least three-credit courses selected from the following:

Nine Credits - Three 4000-level MSE courses (3 or more credits each) selected from MSE 4130, MSE 4160, MSE 4240, MSE 4280, MSE 4320, MSE 4330, MSE 4560, MSE 4570, MSE 4580, MSE 4610, MSE 4900, and MSE 4920.

Six Credits - Two courses (3 or more credits each) selected from MSE 4130, MSE 4160, MSE 4240, MSE 4280, MSE 4320, MSE 4330, MSE 4560, MSE 4570, MSE 4580, MSE 4610, MSE 4900, MSE 4920, or any 3000- or 4000-level courses in AMFG, AUE, BCHM, BE, BIOE, BIOL, BMOL, CE, CH, CHE, ECE, EES, GEOL, IE, MATH, ME, MICR, PHYS, PKSC or STAT, excluding the following:

- BCHM 4900, BCHM 4910, BCHM 4920, BCHM 4930
- BE 3000, BE 3010, BE 3200, BE 3700, BE 3990, BE 4000, BE 4140, BE 4150, BE 4170, BE 4210, BE 4990
- BIOE 3000, BIOE 4000, BIOE 4150, BIOE 4500, BIOE 4510, BIOE 4600, BIOE 4610, BIOE 4900, BIOE 4910
- BIOL 3080, BIOL 3940, BIOL 4260, BIOL 4470, BIOL 4500, BIOL 4600, BIOL 4620, BIOL 4710, BIOL 4760, BIOL 4820, BIOL 4880, BIOL 4890, BIOL 4910, BIOL 4920, BIOL 4930, BIOL 4940, BIOL 4950, BIOL 4960
- CE 3530, CE 3870, CE 3880, CE 3890, CE 3990, CE 4590, CE 4870, CE 4880, CE 4890, CE 4900, CE 4910, CE 4990
- CH 3410, CH 3990, CH 4000, CH 4430, CH 4440, CH 4500, CH 4990
- CHE 3000, CHE 3190, CHE 3950, CHE 3990, CHE 4450, CHE 4910, CHE 4950, CHE 4970, CHE 4990
- ECE 3000, ECE 3990, ECE 4910, ECE 4920, ECE 4930, ECE 4990
- EES 3000, EES 3010, EES 4000, EES 4500, EES 4510, EES 4750, EES 4900, EES 4950
- GEOL 3910, GEOL 3920, GEOL 4110, GEOL 4910, GEOL 4920
- IE 3000, IE 3600, IE 3610, IE 3680, IE 3840, IE 4000, IE 4040, IE 4690, IE 4910
- MATH 3020, MATH 4820, MATH 4910, MATH 4990
- ME 3000, ME 3900, ME 4000, ME 4020, ME 4150, ME 4900, ME 4930
- MICR 3940, MICR 4190, MICR 4910, MICR 4920, MICR 4930, MICR 4940, MICR 4950
- PHYS 3000, PHYS 3990, PHYS 4010, PHYS 4750, PHYS 4990
- PKSC 4030, PKSC 4210, PKSC 4220, PKSC 4950, PKSC 4960, PKSC 4990
- STAT 3090, STAT 3300

NOTES:

1. CH 1010, ENGL 1030, ENGR 1020 (or ENGR 1050 and ENGR 1060 or ENGR 1510 and ENGR 1520 if substituted for ENGR 1020), ENGR 1410 (or ENGR 1070, ENGR 1080, and ENGR 1090 or CHE 1300 and ENGR 1070 or ENGR 1640 if substituted for ENGR 1410), MATH 1080, MATH 1060, and PHYS 1220 must be passed with a grade of C or better.
2. Depending on a student's math placement, they may be invited to take part in the General Engineering Learning Community where they complete the following courses: ENGR 1000, ENGR 1010, ENGR 1100, ENGR 1110, ENGR 1510, ENGR 1520, and ENGR 1640. The combination of ENGR 1510 and ENGR 1520 may be substituted for ENGR 1020. ENGR 1640 may be substituted for ENGR 1410.
3. A transfer course may not be used to satisfy the General Education Global Challenges Requirement. While a transfer course may fulfill other degree requirements, students must enroll in a Clemson course(s) on the Global Challenges list to fulfill the Global Challenges Requirement.