Marlan and Rosemary Bourns College of Engineering

Suggested Course Plan for a UC Riverside Major in

MATERIALS SCIENCE & ENGINEERING

Catalog Year: 2023

Fall Quarter	*Units*	*Winter Quarter*	*Units*	*Spring Quarter*	*Units*
FIRST YEAR					
CHEM 001A & CHEM 01LA	5	CHEM 001B & CHEM 01LB	5	CHEM 001C & CHEM 01LC	5
General Chemistry & Lab		*General Chemistry & Lab*		*General Chemistry & Lab*	
ENGL 001A	4	ENGL 001B	4	CS 009A or CS 010A	4
Beginning Composition		*Intermediate Composition*		*Intro to Programming*	
MATH 009A	4	MATH 009B	4	MATH 009C	4
First Year Calculus		*First Year Calculus*		*First Year Calculus*	
MSE 001	2	Breadth _____	4	Breadth _____	4
Fund. of Materials Science & Engr.		*Biological Sci (BIOL 002, or 003, or 005A/LA)*		*Humanities/Social Sciences*	
SECOND YEAR					
CHEM 008A & CHEM 08LA	4	MATH 010A	4	MATH 010B	4
Organic Chemistry		*Multivariable Calculus*		*Multivariable Calculus*	
MATH 046	4	ME 010	4	MSE 004L	1
Differential Equations		*Statics*		*General Materials Lab*	
MSE 002L	1	MSE 003L	1	PHYS 040C	5
General Materials Lab		*General Materials Lab*		*Physics (Electricity/Magnetism)*	
PHYS 040A	5	PHYS 040B	5	Breadth _____	4
Physics (Mechanics)		*Physics (Heat/Waves/Sound)*		*Humanities/Social Sciences*	
THIRD YEAR					
EE 005	4	BIEN 140A/CEE 140A	4	ENGR 180W*	4
Engineering Circuit Analysis I & Lab		*Biomaterials*		*Technical Communications*	
ME 110	4	CHE 100	4	MSE 135	4
Mechanics of Materials		*Engineering Thermodynamics*		*Intro to Inorganic Mat Synthesis*	
EE 138	4	MSE 134	4	MSE 161	4
Electrical Properties of Materials		*Microstruct Transform in Materials*		*Analytical Materials Characterization*	
ME 114	4	MSE 160	4	Breadth _____	4
Intro to Materials Science & Engr		*Nanostructure Characterization Lab*		*Humanities/Social Sciences*	
FOURTH YEAR					
ME 156	4	MSE 175A	4	MSE 143	4
Mechanical Behavior of Materials		*Senior Design Project*		*Failure Analysis & Prevention*	
STAT 155	4	Technical Elective**	4	MSE 175B	4
Probability & Statistics for Engr		_____		*Senior Design Project*	
Technical Elective**	4	Technical Elective**	4	Technical Elective**	4
_____		_____		_____	
Breadth _____	4	Breadth _____	4	Breadth _____	4
Humanities/Social Sciences		*Humanities/Social Sciences*		*Humanities/Social Sciences*	

Minimum Units to Graduate: 180

Maximum Units to Graduate: 216

To earn a B.S., you must complete all College and University requirements. For a full list of requirements, go to catalog.ucr.edu.

ENGLISH COMPOSITION*

A C or better is required in all English Composition courses to satisfy the graduation requirement. ENGR 180W fulfills the third quarter of English Composition.

BREADTH REQUIREMENTS

For an approved list of Breadth courses: https://student.engr.ucr.edu/policies/breadth-requirements

Humanities: (3 courses)

A. World History: _____

B. Fine Arts, Lit., Phil. or Rlst: _____

C. Human Persp. on Science: _____

Social Sciences: (3 courses)

A. Econ. or Posc.: _____

B. Anth., Psyc, or Soc.: _____

C. General Social Science: _____

Biological Science _____

Ethnicity: (1 course)

1. _____

Upper Division: (2 courses)

1. _____

2. _____

TECHNICAL ELECTIVES **

Please note that Technical Electives may be offered throughout the Academic Year. Consult with your Academic Advisor about potential offerings. See approved technical electives on back.

Course Plan is subject to change.

Materials Science & Engineering Technical Electives & Focus Areas

You must complete 4 courses (at least 16 units) of Technical Elective coursework, selected from the courses below. Units are listed in ().

Polymers and Biomaterials

BIEN/MSE 136	Tissue Engineering (4)
BIEN 140B	Biomaterials (4)
MSE 197	Research for Undergraduates (1-4)

Electronic, Photonic, and Magnetic Materials

EE 133	Solid-State Electronics (4)
EE 136	Semiconductor Device Processing (4)
EE 137	Intro to Semiconductor Optoelectronic Devices (4)
EE 139	Magnetic Materials (4)
EE 162	Introduction to Nanoelectronics (4)
MSE 197	Research for Undergraduates (1-4)

Synthesis and Processing of Nanomaterials

CHE 105	Introduction to Nanoscale Engineering (4)
CHE 161	Nanotechnology Processing Laboratory (3)
EE 162	Introduction to Nanoelectronics (4)
MSE 197	Research for Undergraduates (1-4)

Structural Materials

MSE 142	Corrosion Science (4)
MSE 148	Advanced Solidification Processing (4)
MSE 197	Research for Undergraduates (1-4)

Computation and Modeling of Materials

ME 153	Finite Element Methods (4)
MSE 155	Materials Science of the Solid State (4)
MSE 156	Atomistic Modeling of Materials (4)
MSE 197	Research for Undergraduates (1-4)

* Note that many Technical Electives will require that you complete additional courses as pre-requisites not accounted for in the undergraduate program. Consult the Faculty Advisor regarding the pre-requisite coursework for the Technical Electives you would like to take.