BS in Chemical Engineering with Emphasis in Materials

Degree Program Description

The materials emphasis builds on the core Chemical Engineering curriculum (https://catalog.missouri.edu/collegeofengineering/chemicalengineering/bs-chemical-engineering/) to include courses of interest to students who wish to pursue careers and/or interests in materials science and solid-state physics. The emphasis area requirements cover basic topics in materials science, after which the student is asked to choose at least one course covering a more specific area of materials: ceramics, polymers, biological materials, or composites. Students are then free to choose electives in other areas, including optical materials, semiconductors, advanced materials, structural materials, and materials characterization. Students selecting the materials emphasis have all the advantages of an education in chemical engineering along with specialized knowledge of materials, giving them a valuable base from which to build a career.

Major Program Requirements

Students must complete all BSChE requirements (https://catalog.missouri.edu/collegeofengineering/chemicalengineering/bs-chemical-engineering/), including the emphasis area requirements below.

Emphasis Area Requirements		
ENGINR 1200	Statics and Elementary Strength of Materials	3
ENGINR 2200	Intermediate Strength of Materials	3
CH_ENG 3075	Introduction to Materials Engineering	3
Choose one course from List A		3
Choose two courses from List A or List B		6
List A		
CH_ENG 4232	Ceramic Materials and Processing	3
CH_ENG 4319	Introduction to Polymers	3
BIOL_EN 3170	Biomaterials	3
MAE 4250	Composite Materials	3
List B		
BIOL_EN 4170	Biomaterials Interfaces of Implantable Devices	3
BIOL_EN 4231	Transport Phenomena in Materials Processing	3
BIOL_EN 4480	Physics and Chemistry of Materials *	3
CH_ENG 4317	Chemical Processing in Semiconductor Devices	3
CV_ENG 4104	Pavement Materials and Design	3
CV_ENG 4300	Advanced Structural Steel Design	3
ECE 3610	Semiconductors and Devices	3
ECE 4630	Introduction to Optical Electronics	3
ECE 4880	Micro/Nano Systems	3
ISE 4560	Introduction to Rapid Prototyping	3
MAE 2200	Engineering Materials	3
MAE 4220	Materials Selection	3
MAE 4230	Nanomaterials	3
MAE 4270	Nondestructive Evaluation of Materials	3
MAE 4600	Advanced Mechanics of Materials	3
PHYSCS 4620	Introduction to Materials Science	3
PHYSCS 4650	Modern Condensed Matter Physics	3

* BIOL_EN 4480 is the same as BME 4480, CHEM 4490, NU_ENG 4319, and PHYSCS 4190 and satisfies the chemistry requirement.

Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year					
Fall	**CR**		**Spring**	**CR**	
MATH 1500	5		MATH 1700	5	
CHEM 1400	3		CHEM 1410	3	
CHEM 1401	1		CHEM 1411	1	
CH_ENG 1000	2		PHYSCS 2750	5	
ENGLSH 1000	3		CH_ENG 2225	3	
Approved history/poli. sci. elective	3				
	17				**17**
Second Year					
Fall	**CR**		**Spring**	**CR**	
MATH 2300	3		MATH 4100	3	
CHEM 2100	3		CHEM 2110	3	
PHYSCS 2760	5		CHEM 2130	2	
CH_ENG 2226	3		CH_ENG 3262	3	
CH_ENG 3261	3		Humanities or social/behavioral sciences	3	
	17				**14**
Third Year					
Fall	**CR**		**Spring**	**CR**	
STAT 4710	3		CH_ENG 3075	3	
CH_ENG 3233	3		CH_ENG 3234	3	
ENGINR 1200	3		CH_ENG 3235	3	
Chemistry elective	3		CH_ENG 4370	3	
Economics elective	3		ENGINR 2200	3	
	15				**15**
Fourth Year					
Fall	**CR**		**Spring**	**CR**	
CH_ENG 3243W	3		CH_ENG 4319	3	
CH_ENG 4232	3		CH_ENG 4980W	3	
CH_ENG 4363	3		Materials elective	3	
CH_ENG 4385	3		Humanities/fine arts or social/behavioral sciences	3	
Humanities/fine arts or social/behavioral sciences	3		Humanities/fine arts or social/behavioral sciences	3	
	15				**15**

Total Credits: 125