Specimen Curriculum for Double Major in Chemical Engineering and Biomedical Engineering

Double Major in Chemical Engineering and Biomedical Engineering and Minor in Chemistry

		Semester hours	
FIRST YEAR		FALL	SPRING
CS 110X	Computing Requirement (CS 1101 or 1103 or 1104)	3	–
ChBE 2100	Chemical Process Principles	–	3
		17	15
SOPHOMORE YEAR			
BSci 1510, 1510L	Introduction to Biological Sciences and Laboratory	4	–
Chem 2221, 2221L	Organic Chemistry and Laboratory	4	–
Chem 2222, 2222L	Organic Chemistry and Laboratory	–	4
Math 2300	Multivariable Calculus	3	–
Math 2400	Differential Equations with Linear Algebra	–	4
Phys 1602, 1602L	General Physics II and Laboratory	4	–
BME 2301, 2302	Systems Physiology I and II	3	3
BME 2900W	Biomedical Engineering Laboratory I	–	1
ChBE 2200	Chemical Engineering Thermodynamics	–	3
EECE 2112	Circuits I	–	3
		18	18
JUNIOR YEAR			
BME 2100	Biomechanics	3	–
BME 2400	Quantitative Methods I: Statistical Analysis	3	–
BME 3301	Biomedical Instrumentation I	–	4
BME 3400	Quantitative Methods II: Signals and Modeling	3	–
BME 3500	Biomedical Materials	–	3
BME 3900W	Biomedical Engineering Laboratory II	–	1
ChBE 3200	Phase Equilibria and Stage-Based Separations	3	–
ChBE 3250	Chemical Reaction Engineering	–	3
ChBE 3300	Fluid Mechanics and Heat Transfer	3	–
ChBE 3350	Mass Transfer and Rate-Based Separations	–	3
	Liberal Arts Core	–	3
		17	17
SENIOR YEAR			
BME 3302	Biomedical Instrumentation II	4	–
BME 4959	Senior Engineering Design Seminar	1	–
ChBE 4900W	Chemical Engineering Laboratory II	3	–
ChBE 4950W	Chemical Engineering Process and Product Design	4	–
ChBE 4951W	Chemical Engineering Design Projects	–	3
ChBE 4959	Professional Practice of Safety in ChE Design	1	–
	Chemical/Biomedical Engineering elective*	–	3
	Liberal Arts Core	3	9
		16	15

*Additional electives from ChBE and/or BME are recommended if space allows.

Specimen Curriculum for Double Major in Chemical Engineering and Biomedical Engineering
 For students with AP Credit for Math 1300, 1301, Chem 1601, 1601L, 1602, 1602L (see schedule on last page)

Double Major in Chemical Engineering and Biomedical Engineering and Minor in Chemistry

		Semester hours	
FIRST YEAR		FALL	SPRING
Chem 2211, 2221L	Organic Chemistry and Laboratory	4	–
Chem 2212, 2222L	Organic Chemistry and Laboratory	–	4
Math 2300	Multivariable Calculus	3	–
Math 2400	Differential Equations with Linear Algebra	–	4
CS 110X	Computing Requirement (CS 1101 or 1103 or 1104)	–	3
		13	15
SOPHOMORE YEAR			
BSci 1510, 1510L	Introduction to Biological Sciences	4	–
Phys 1602, 1602L	General Physics II and Laboratory	4	–
ChBE 2100	Chemical Process Principles	3	–
ChBE 2200	Chemical Engineering Thermodynamics	–	3
BME 2301, 2302	Systems Physiology I and II	3	3
BME 2400	Quantitative Methods I: Statistical Analysis	3	–
BME 2900W	Biomedical Engineering Laboratory I	–	1
EECE 2112	Circuits I	–	3
		14	13
JUNIOR YEAR			
ChBE 3200	Phase Equilibria and Stage-Based Separations	3	–
ChBE 3250	Chemical Reaction Engineering	–	3
ChBE 3300	Fluid Mechanics and Heat Transfer	3	–
ChBE 3350	Mass Transfer and Rate-Based Separations	–	3
BME 2100	Biomechanics	3	–
BME 3400	Quantitative Methods II: Signals and Modeling	3	–
BME 3500	Biomedical Materials	–	3
BME 3900W	Biomedical Engineering Laboratory II	–	1
BME 3301	Biomedical Instrumentation I	–	4
	Liberal Arts Core	3	–
		15	14
SENIOR YEAR			
BME 3302	Biomedical Instrumentation II	4	–
BME 4959	Senior Engineering Design Seminar	1	–
ChBE 4900W	Chemical Engineering Laboratory II	3	–
ChBE 4950W	Chemical Engineering Process and Product Design	4	–
ChBE 4951W	Chemical Engineering Design Projects	–	3
ChBE 4959	Professional Practice of Safety in ChE Design	1	–
	Chemical/Biomedical Engineering elective*	–	3
	Liberal Arts Core	3	9
		16	15

*Additional electives from ChBE and/or BME are recommended if space allows.

	YEAR 1		YEAR 2		YEAR 3		YEAR 4	
	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
	Accelerated Single-Variable Calculus I Math 1300 4 hours	Accelerated Single-Variable Calculus II Math 1301 4 hours	Multivariable Calculus Math 2300 3 hours	Differential Equations and Linear Algebra Math 2400 4 hours	Phase Equilibria & Staged-based Separations ChBE 3200 3 hours	Chemical Reactor Engineering ChBE 3250 3 hours	Chemical Engineering Laboratory II ChBE 4900W 3 hours	Chemical Engineering Design Projects ChBE 4951W 3 hours
	General Chemistry Chem 1601 3 hours	General Chemistry Chem 1602 3 hours	Organic Chemistry Chem 2221 3 hours	Organic Chemistry Chem 2222 3 hours	Fluid Mechanics & Heat Transfer ChBE 3300 3 hours	Mass Transfer and Rate-based Separations ChBE 3350 3 hours	Chemical Engineering Process and Product Design ChBE 4950W 4 hours	ChE/BME Elective 3 hours
	General Chemistry Laboratory Chem 1601L 1 hour	General Chemistry Laboratory Chem 1602L 1 hour	Organic Chemistry Laboratory Chem 2221L 1 hour	Organic Chemistry Laboratory Chem 2222L 1 hour	Biomechanics BME 2100 3 hours	Biomedical Instrumentation I BME 3301 4 hours	Professional Practice of Safety in ChE Design ChBE 4959 1 hour	Liberal Arts Core Elective 3 hours
	Introduction to Engineering ES 1401, 1402, 1403 3 hours	General Physics I Phys 1601 3 hours	General Physics II Phys 1602 3 hours	Circuits I EECE 2212 3 hours	Quantitative Methods I: Statistical Analysis BME 2400 3 hours	Biomedical Materials BME 3500 3 hours	Biomedical Instrumentation II BME 3302 4 hours	Liberal Arts Core Elective 3 hours
	Computer Science Requirement CS 1101, 1103, or 1104 3 hours	General Physics Laboratory I Phys 1601L 1 hour	General Physics Laboratory II Phys 1602L 1 hour	Chemical Engineering Thermodynamics ChBE 2200 3 hours	Quantitative Methods II: Signals & Modeling BME 3400 3 hours	Biomedical Engineering Laboratory II BME 3900W 1 hour	Senior Design Seminar BME 4959 1 hour	Liberal Arts Core Elective 3 hours
	Liberal Arts Core Elective 3 hours	Chemical Process Principles ChBE 2100 3 hours	Introduction to Biological Sciences BSCI 1510 3 hours	Systems Physiology II BME 2302 3 hours		Liberal Arts Core Elective 3 hours	Liberal Arts Core Elective 3 hours	
			Biological Sciences Laboratory BSCI 1510L 1 hour	Biomedical Engineering Laboratory I BME 2900W 1 hour				
			Systems Physiology I BME 2301 3 hours					
	17 hours	15 hours	18 hours	18 hours	15 hours	17 hours	16 hours	15 hours

Total
131 hours

AP Credit		YEAR 1		YEAR 2		YEAR 3		YEAR 4	
		Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
General Chemistry Chem 1601 3 hours		Organic Chemistry for AP Students Chem 2211 3 hours	Organic Chemistry for AP Students Chem 2211 3 hours	Introduction to Biological Sciences BSCI 1510 3 hours	Circuits I EECE 2212 3 hours	Phase Equilibria & Staged-based Separations ChBE 3200 3 hours	Chemical Reactor Engineering ChBE 3250 3 hours	Chemical Engineering Laboratory II ChBE 4900W 3 hours	Chemical Engineering Design Projects ChBE 4951W 3 hours
General Chemistry Laboratory Chem 1601L 1 hour		Organic Chemistry Laboratory Chem 2221L 1 hour	Organic Chemistry Laboratory Chem 2222L 1 hour	Biological Sciences Laboratory BSCI 1510L 1 hour	Chemical Engineering Thermodynamics ChBE 2200 3 hours	Fluid Mechanics & Heat Transfer ChBE 3300 3 hours	Mass Transfer and Rate-based Separations ChBE 3350 3 hours	Chemical Engineering Process and Product Design ChBE 4950W 4 hours	ChE/BME Elective 3 hours
General Chemistry Chem 1602 3 hours		Multivariable Calculus Math 2300 3 hours	Differential Equations with Linear Algebra Math 2400 4 hours	Chemical Process Principles ChBE 2100 3 hours	Systems Physiology II BME 2302 3 hours	Biomechanics BME 2100 3 hours	Biomedical Instrumentation I BME 3301 4 hours	Professional Practice of Safety in ChE Design ChBE 4959 1 hour	Liberal Arts Core Elective 3 hours
General Chemistry Laboratory Chem 1602L 1 hour		Introduction to Engineering ES 1401, 1402, 1403 3 hours	Computer Science Course CS 1101, 1103, or 1104 3 hours	Systems Physiology I BME 2301 3 hours	Quantitative Methods I: Statistical Analysis BME 2400 3 hours	Quantitative Methods II: Signals & Modeling BME 3400 3 hours	Biomedical Materials BME 3500 3 hours	Biomedical Instrumentation II BME 3302 4 hours	Liberal Arts Core Elective 3 hours
Accelerated Single-Variable Calculus I Math 1300 4 hours		Liberal Arts Core Elective 3 hours	General Physics I Phys 1601 3 hours	General Physics II Phys 1602 3 hours	Biomedical Engineering Laboratory I BME 2900W 1 hour	Liberal Arts Core Elective 3 hours	Biomedical Engineering Laboratory II BME 3900W 1 hour	Senior Design Seminar BME 4959 1 hour	Liberal Arts Core Elective 3 hours
Accelerated Single-Variable Calculus II Math 1301 4 hours			General Physics Laboratory I Phys 1601L 1 hour	General Physics Laboratory II Phys 1602L 1 hour				Liberal Arts Core Elective 3 hours	
16 hours		13 hours	15 hours	14 hours	13 hours	15 hours	14 hours	16 hours	15 hours

Total
131 hours