

## Specimen Curriculum for Chemical Engineering with emphasis in Data Science

*B.E. in Chemical Engineering with Minor in Data Science and Minor in Chemistry*

		Semester hours	
		FALL	SPRING
SOPHOMORE YEAR			
Chem 2221, 2221L	Organic Chemistry and Laboratory	4	–
Chem 2222, 2222L	Organic Chemistry	–	4
DS 1000	Data Science: How Data Shape Our World	3	–
Math 2300	Multivariable Calculus	3	–
Math 2420	Methods of Ordinary Differential Equations	–	3
Physics 1602, 1602L	General Physics II and Laboratory	4	–
ChBE 2100	Chemical Process Principles	3	–
ChBE 2200	Chemical Engineering Thermodynamics	–	3
ChBE 2250	Modeling and Simulation in Chemical Engineering	–	3
ChBE 2900W	Technical Communications for Chemical Engineers	–	1
	Liberal Arts Core	–	3
		17	17
JUNIOR YEAR			
Chem 3300*	Physical Chemistry: Quantum Mechanics	3	–
DS 3100	Fundamentals of Data Science	4	–
ChBE 2150†	Molecular and Cell Biology for Engineers	3	–
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
ChBE 3900W	Chemical Engineering Laboratory I	–	3
	Chemical and Biomolecular Engineering elective	–	3
	Data Science Statistics elective	–	3
		16	15
SENIOR YEAR			
ChBE 3600	Chemical Process Control	3	–
ChBE 4900W	Chemical Engineering Laboratory II	3	–
ChBE 4950W	Chemical Engineering Process and Product Design	4	–
ChBE 4951W	Chemical Product Design Projects	–	3
ChBE 4959	Professional Practice of Safety in ChE Design	1	–
	Chemical and Biomolecular Engineering elective	–	3
	Data Science Machine Learning elective	3	–
	Data Science Statistics elective	–	3
	Liberal Arts Core	–	6
	Open elective	2	–
		16	15

\*May be replaced by BSCI 2201 or BSC 2520 after completion of ChBE 2150 or BSCI 1510.

†May be replaced by BSCI 1510.

YEAR 1		YEAR 2		YEAR 3		YEAR 4	
Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
<b>General Chemistry Chem 1601</b> 3 hours	<b>General Chemistry Chem 1602</b> 3 hours	<b>Organic Chemistry Chem 2221</b> 3 hours	<b>Organic Chemistry Chem 2222</b> 3 hours	<b>Science Elective: Chem 3300* or BSCI 2201# or BSC 2520</b> 3 hours	<b>Chemical Reactor Engineering ChBE 3250</b> 3 hours	<b>Chemical Process Control ChBE 3600</b> 3 hours	<b>Chemical Engineering Design Projects ChBE 4951W</b> 3 hours
<b>General Chemistry Laboratory Chem 1601L</b> 1 hour	<b>General Chemistry Laboratory Chem 1602L</b> 1 hour	<b>Organic Chemistry Laboratory Chem 2221L</b> 1 hour	<b>Organic Chemistry Laboratory Chem 2222L</b> 1 hour	<b>Molecular and Cell Biology for Engineers ChBE 2150</b> 3 hours	<b>Mass Transfer and Rate-based Separations ChBE 3350</b> 3 hours	<b>Chemical Engineering Laboratory II ChBE 4900W</b> 3 hours	<b>ChBE Elective</b> 3 hours
<b>Accelerated Single-Variable Calculus I Math 1300</b> 4 hours	<b>Accelerated Single-Variable Calculus II Math 1301</b> 4 hours	<b>Multivariable Calculus Math 2300</b> 3 hours	<b>Methods of Ordinary Differential Eqs Math 2420</b> 3 hours	<b>Phase Equilibria &amp; Staged-based Separations ChBE 3200</b> 3 hours	<b>Chemical Engineering Laboratory I ChBE 3900W</b> 3 hours	<b>Chemical Engineering Process and Product Design ChBE 4950W</b> 4 hours	<b>Data Science Elective**</b> 3 hours
<b>Introduction to Engineering ES 1401, 1402, 1403</b> 3 hours	<b>General Physics I Phys 1601</b> 3 hours	<b>General Physics II Phys 1602</b> 3 hours	<b>Chemical Engineering Thermodynamics ChBE 2200</b> 3 hours	<b>Fluid Mechanics &amp; Heat Transfer ChBE 3300</b> 3 hours	<b>ChBE Elective</b> 3 hours	<b>Professional Practice of Safety in ChE Design ChBE 4959</b> 1 hour	<b>Liberal Arts Core Elective</b> 3 hours
<b>Liberal Arts Core Elective</b> 3 hours	<b>General Physics Laboratory I Phys 1601L</b> 1 hour	<b>General Physics Laboratory II Phys 1602L</b> 1 hour	<b>Modeling and Simulation in Chem Eng ChBE 2250</b> 3 hours	<b>Fundamentals of Data Science DS 3100</b> 4 hours	<b>Data Science Statistics Elective**</b> 3 hours	<b>Data Science Machine Learning Elective**</b> 3 hours	<b>Liberal Arts Core Elective</b> 3 hours
	<b>Computer Science Requirement CS 1100</b> 3 hours	<b>Chemical Process Principles ChBE 2100</b> 3 hours	<b>Technical Communications for Chemical Engineers ChBE 2900W</b> 1 hour			<b>Open Elective</b> 2 hours	
		<b>Data Science: How Data Shape Our World DS 1000</b> 3 hours	<b>Liberal Arts Core Elective</b> 3 hours				
14 hours	15 hours	17 hours	17 hours	16 hours	15 hours	16 hours	15 hours

**Total**

**125 hours**

\*Chem 3300 is preferred

#Switch with an elective in a subsequent semester

\*\*Assumes one Data Science elective is an LAC course. If none are a LAC course, replace Open Elective with 3 hr LAC course.