

# John Carroll University Chemistry & Biochemistry Department

## Chemistry Major (3+2 Chem Eng Program at CWRU) Study Plan (JCU Portion)

### First Year

Fall Semester	Credits	Major	Core	Minor/Other	Spring Semester	Credits	Major	Core	Minor/Other
CH1410 General Chemistry I*	4	X			CH1420 General Chemistry II*	4	X		
CH1430 General Chemistry Lab I*	1	X			CH1440 General Chemistry Lab II*	1	X		
MT1350 Calculus / Analytic Geometry I	4	X			MT1360 Calculus / Analytic Geometry II	4	X		
EN1250 Seminar on Academic Writing*	3		X		COM1251 Speech Communications	3		X	
PH1250 General Physics I	4	X			PH1260 General Physics II	4	X		
PH1511 Physics Workshop I	1	X			PH1521 Physics Workshop II	1	X		
<b>Total Credit Hours</b>	<b>17</b>				<b>Total Credit Hours</b>	<b>17</b>			

### Second Year

Fall Semester	Credits	Major	Core	Minor/Other	Spring Semester	Credits	Major	Core	Minor/Other
CH2210 Organic Chemistry I	3	X			CH2220 Organic Chemistry II	3	X		
CH2230 Organic Chemistry Lab I	1	X			CH2240 Organic Chemistry Lab II	1	X		
MT2330 Calculus/Analytical Geometry III	4	X			CH2610 Analytical Chemistry	3	X	X	
CS1280 Problem Solving w/Programming	3	X			CH2630 Analytical Chemistry Lab (QA)	1	X	X	
CS1281 Problem Solving/Program lab	1	X			TRS Course	3		X	
TRS Course	3		X		Physical Education Elective	1		X	
Engaging the Global Community (EGC)	3		X		Philosophy Values/Society (PLVS)	3		X	
					EP2560 Math Methods Physics/Engineer	3	X		
<b>Total Credit Hours</b>	<b>18</b>				<b>Total Credit Hours</b>	<b>18</b>			

### Third Year

Fall Semester	Credits	Major	Core	Minor/Other	Spring Semester	Credits	Major	Core	Minor/Other
CH3630 Physical Chemistry I	3	X			CH3660 Physical Chemistry II	3	X		
CH3670 Physical Chemistry I Lab	2	X			CH4780 Chemistry Seminar	0	X		
CH4410 Instrumental Analysis	3	X			Issues in Social Justice Course	3		X	
CH4430 Instrumental Analysis Lab*	2		X		Philosophy Knowledge/Reality (PLKR)	3		X	
Humanities Course	3		X		Physical Education Elective	1			X
Social Science Course	3		X		Creative and Performing Arts (CAPA)	1-3		X	
Elective	1		X	X	Linked Pair of Courses	6		X	
<b>Total Credit Hours</b>	<b>17</b>				<b>Total Credit Hours</b>	<b>17</b>			

### Fourth Year

Fall Semester	Credits	Major	Core	Minor/Other	Spring Semester	Credits	Major	Core	Minor/Other
ECHE 260 Intro to Chemical Systems	3			X	Career or Program Electives	15	X	X	
ENGR 225 Thermodynamics, Fluid Dynamics, Heat and Mass Transfer	4			X					
ECHE 360 Transport Phenomena	3			X					
ECHE 151 Chemical Engineering @CWRU	3			X					
ENGR 200 Statics & Strength of Materials	3			X					
<b>Total Credit Hours</b>	<b>16</b>				<b>Total Credit Hours</b>	<b>15</b>			

**Total of 103 JCU Credits - 17 credits will be transferred back to JCU from CWRU**

**Notes:**

\*Well prepared students may substitute the CH1410-1440 sequence with CH1510/1530 - Chemical Principles and Lab in the Fall Semester

\*\*CH4430 will satisfy the Core Requirements for Capstone, Advanced Writing, and Oral Presentation within the major (CAP, AW, OP)

Please consult your academic advisor to address specific needs of your major, minor, and/or concentration.