

# John Carroll University Chemistry and Biochemistry Department

## B.S. Chemistry with Concentration in Chemical Physics, 5th year MBA Study Plan

### 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		Engaging the Global Community (EGC)	3		X	
COM1251 Speech Communications	3		X		Issues in Social Justice Course (ISJ)	3		X	
TRS Course	3		X		Philosophy Knowledge/Reality	3		X	
<b>Total Credit Hours</b>	<b>18</b>				<b>Total Credit Hours</b>	<b>18</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 and Analytic Geom III	3	X			CH2610 Analytical Chemistry	3	X		
PH1510 General Physics I	4	X			CH2630 Analytical Chemistry Lab (QA)	1	X	X	
PH1511 Physics Workshop I	1	X			PH1520 Physics II	4	X		
BL1100 Business Analysis with Excel	1			X	PH1521 Physics Workshop II	1	X		
PL2086 Business Ethics (PLVS)	3		X	X	EC2201 Fundamentals of Economics	3		X	
<b>Total Credit Hours</b>	<b>16</b>				<b>Total Credit Hours</b>	<b>16</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			CH3680 Physical Chemistry Lab II***	1	X		
CH399 Undergraduate Research	1	X			CH4780 Chemistry Seminar	0	X		
PH2540 Modern Physics	3	X			CH399 Undergraduate Research**	1	X		
Humanities Course	3		X		CH4310 General Biochemistry****	4	X		
Social Science Course	3		X		EP2560 Math. Methods Physics/Engineer	3	X		
AC2201 Fundamentals of Accounting	3			X	Management	3			X
					TRS Course	3		X	
<b>Total Credit Hours</b>	<b>15</b>				<b>Total Credit Hours</b>	<b>18</b>			

### Fourth Year

Fall Semester	Credits	Major	Core	Minor/Other	Spring Semester	Credits	Major	Core	Minor/Other
CH4410 Instrumental Analysis	3	X			CH4810 Inorganic Chemistry	3	X		
CH4430 Instrumental Analysis Lab**	2	X			CH4820 Inorganic Chemistry Lab	1	X		
CH399 Undergraduate Research	1	X			Linked Pair of Courses	6		X	
CH4950 Special Topics	3	X			Creative and Performing Arts (CAPA)	1-3		X	
MK3301 Marketing Principles	3			X	FN3312 Business Finance	3			X
Language Requirement	3		X		Language Requirement	3		X	
<b>Total Credit Hours</b>	<b>15</b>				<b>Total Credit Hours</b>	<b>17</b>			

If you are planning to attend graduate school, take the GRE in summer between the 3rd and 4th years or early fall and begin submitting applications in the fall of the 4th year.

**Total CH Credit Hours Required: 42    Total Credit Hours Required to Graduate: 120**

#### 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)

\*\*\* The combinations of CH3660 and 3680 and CH4810 and 4820 may be interchanged in the junior and senior years.

\*\*\*\* Students may complete CH4350 and CH4360 in place of CH4310 and one upper division elective.

\*\*\*\*\* Two Upper Division Chemistry Electives and 1 Lab Elective are required.

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