Chemistry-Biology Dual Major

- Rigorous curriculum in Biology and Chemistry prepares students for many options in research, employment or professional schools
- Strong emphasis on independent research and skill acquisition
- Opportunity to use specialized instrumentation
- Emphasis on hands-on learning
- University of Charleston Student Chapter of the American Chemical Society on campus

From the Faculty

"This specially-designed BS degree program allows interested students to obtain a dual-major in chemistry and biology within a four-year timeframe. BS degree holders possessing a strong knowledge base in both chemistry and biology are particularly competitive for professional schools.

The mission of the chemistry-biology dual-major program is to educate each student about the nature of chemistry, biology and biochemistry, and to prepare the student with sufficient knowledge and skills to pursue productive work in chemistry, biology or biochemistry in a professional or graduate school, or in the workforce, and to pursue enlightened living and community involvement."

Admission Requirements

Students must gain general admission to the University of Charleston. A visit to campus to meet with Admissions personnel and program faculty is strongly encouraged.

Program Outcomes

The graduate will:

1. Apply the major concepts, principles and theories of chemistry to solve problems.
2. Demonstrate safe and ethical laboratory and synthesis skills to obtain accurate results.
3. Search the chemical literature, perform research, and create new scientific knowledge.
4. Evaluate data and communicate the findings of a chemical research project.

What You Will Study

The Program consists of 40 credits of required chemistry courses, 32 credits of required and elective biology courses, 20 credits of required mathematics and physics courses, 3 credits in the Natural Science Sequence, and 40 credits of General Education. In order to graduate, a student must receive a minimum grade of "C" for each of the

chemistry, biology, mathematics, physics, and natural science courses. The science and mathematics curriculum for this Dual-Major Program is as follows:

REQUIRED CHEMISTRY COURSES - 40 CREDIT HOURS		
CHEM 101	General Chemistry I and Lab	4 credits
CHEM 102	General Chemistry II and Lab	4 credits
CHEM 201	Organic Chemistry I and Lab	4 credits
CHEM 202	Organic Chemistry II and Lab	4 credits
CHEM 251	Quantitative Analysis and Lab	4 credits
CHEM 362	Instrumental Analysis and Lab	4 credits
CHEM 410	Biochemistry	4 credits
CHEM 411 **OR** CHEM 420	Advanced Organic Chemistry Advanced Biochemistry	3 credits
CHEM 412	Physical Chemistry I	3 credits
CHEM 414	The Chemist's Tool Box	1 credit
CHEM 494	Proposal Writing in Chemistry	1 credit
CHEM 495	Research in Chemical Science	3 credits
CHEM 496	Seminar in Chemical Science	1 credit

REQUIRED BIOLOGY COURSES – 30 to 32 CREDT HOURS		
BIOL 130	Introductory Biology for Majors and Lab	4 credits
BIOL 215 **OR** BIOL 224	General Botany and Lab or General Zoology and Lab	4 credits
BIOL 301	Human Anatomy and Physiology I and Lab	4 credits
BIOL 302	Human Anatomy and Physiology II and Lab	4 credits
BIOL 331	Microbiology for Majors and Lab	4 credits
BIOL 332	Genetics and Lab	4 credits
BIOL XXX	300 or 400-level Electives and Labs	6-8 credits

REQUIRED MATHEMATICS COURSES – 12 CREDIT HOURS		
MATH 123	Pre-Calculus	4 credits
MATH 201	Calculus I	4 credits
MATH 202	Calculus II	4 credits

REQUIRED PHYSICS COURSES – 8 CREDIT HOURS		
PHSC 201	Introductory Physics I and Lab	4 credits
PHSC 202	Introductory Physics II and Lab	4 credits

REQUIRED NATURAL SCIENCE COURSE – 3 CREDIT HOURS		
NSCI 220	Statistics in Science and Research	3 credits

An AP score of 4 or higher may be used to fulfill the CHEM 101 and CHEM 102 requirement. The initial course in MATH and eligibility to take CHEM 101 will be determined based on SAT and/or ACT Math Scores.

Typical four-year schedule:

FRESHMAN YEAR			
FALL SEMESTER		**SPRING SEMESTER**	
CHEM 101 General Chemistry I and Lab (STEM Flex)	4	CHEM 102 General Chemistry II and Lab	4
		SPCH 103 Fundamentals of Speech	3
COMM 101 Freshman Writing I	3	COMM 102 Freshman Writing II	3
BIOL 130 Introductory Biology Majors and Lab (STEM Flex)	4		
MATH 123 Pre-Calculus (Flex elective)	4	MATH 201 Calculus I (Flex elective)	4
UNIV 104 College Motivation	3	UNIV 105 Foundations	3
TOTAL CREDITS	**18**	**TOTAL CREDITS**	**17**

SOPHOMORE YEAR			
FALL SEMESTER		**SPRING SEMESTER**	
CHEM 201 Organic Chemistry I and Lab	4	CHEM 202 Organic Chemistry II and Lab	4
BIOL 301 A&P I and Lab	4	BIOL 302 A&P II and Lab	4
MATH 202 Calculus II	4	SSCI Flex (Recommend HIST)	3
		HUMN Flex (Recommend Art)	3
PHSC 201 Introductory Physics I and Lab	4	PHSC 202 Introductory Physics II and Lab	4
TOTAL CREDITS	**16**	**TOTAL CREDITS**	**18**
JUNIOR YEAR			
FALL SEMESTER		**SPRING SEMESTER**	
CHEM 251 Quantitative Analysis and Lab	4	CHEM 362 Instrumental Analysis and Lab	4
BIOL 331 Microbiology and Lab	4	BIOL 332 Genetics and Lab	4
NSCI 220 Statistics	3	HUMN Flex (Recommend ENGL)	3
CHEM 420 Biochemistry	4	BIOL XXX Upper level class and Lab	4
SSCI Flex (Recommend PSYC)	3	BIOL 215 or 224 and Lab	4
TOTAL CREDITS	**18**	**TOTAL CREDITS**	**19**
SENIOR YEAR			
FALL SEMESTER		**SPRING SEMESTER**	
CHEM 412 Physical Chemistry I	3	CHEM 414 Chemist's Toolbox	1
CHEM 494 Proposal Writing in Chemistry	1	CHEM 411 Advanced Organic	3
BIOL XXX Upper Level class	4	CHEM 496 Seminar in Chem. Science	1
CHEM 495 Research in Chem. Science	3	UNIV 459 or 460 University Capstone	3
HUMN Flex (Recommend ENGL)	3	BIOL XXX Upper level class and Lab	4
Elective	3	Elective	3
TOTAL CREDITS	**17**	**TOTAL CREDITS**	**15**

Please note that many chemistry and biology classes have a lab. Although the lab is registered for as a separate class, the credit hour totals above include the lab hours. The student must pass both the lecture and lab portion of the class in order to receive any of the credit.

It is possible to obtain a Chemistry degree in 3 years. Please contact Dr. Watson for a schedule.

Additional Requirements

Students must meet all General Education required for graduation from the University of Charleston. Students should take care to fulfill prerequisites for upper division courses as noted in the course descriptions.