

CHEMISTRY-BIOLOGY DUAL MAJOR

Dr. Juliana Serafin, Program Director

- 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, 24 credits of required mathematics and physics courses, 3 credits in the Natural Science Sequence, and 50 credits of Liberal Learning Outcomes. 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	4 credits
CHEM 102	General Chemistry II	4 credits
CHEM 201	Organic Chemistry I	4 credits
CHEM 202	Organic Chemistry II	4 credits
CHEM 251	Quantitative Analysis	4 credits
CHEM 362	Instrumental Analysis	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 – 32 CREDIT HOURS

BIOL 130	Introductory Biology for Majors	4 credits
BIOL 215 OR BIOL 224	General Botany General Zoology	4 credits
BIOL 301	Human Anatomy & Physiology I	4 credits
BIOL 302	Human Anatomy & Physiology II	4 credits
BIOL 331	Microbiology for Majors	4 credits
BIOL 332	Genetics	4 credits
BIOL XXX	300 or 400-level Electives	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	4 credits
PHSC 202	Introductory Physics II	4 credits

REQUIRED NATURAL SCIENCE COURSE – 3 CREDIT HOURS

NSCI 220	Statistics in Science and Research	3 credits
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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	4	CHEM 102 General Chemistry II	4
FYE HUMN 1XX or SSCI 1XX	3	FYE HUMN 1XX or SSCI 1XX)	3
COMM 101 Writing I*	3*	COMM 102* Writing II	3*
BIOL 130 Introductory Biology Majors	4	NSCI 220 Statistics in Research	3
MATH 123 Pre-Calculus	4	MATH 201 Calculus I	4
UNIV 101 Orientation to University	1	UNIV 102 The University Experience	2
		SPCH 103 Fundamentals of Speech**	3**
TOTAL CREDITS	16+3	TOTAL CREDITS	16+6

*Embedded in HUMN 1XX or SSCI 1XX

**Embedded in UNIV 102

SOPHOMORE YEAR			
FALL SEMESTER		SPRING SEMESTER	
CHEM 201 Organic Chemistry I	4	CHEM 202 Organic Chemistry II	4
BIOL 301 A&P I	4	BIOL 302 A&P II	4
MATH 202 Calculus II	4	HIST 251 or 252	3
PHSC 201 Introductory Physics I	4	PHSC 202 Introductory Physics II	4
TOTAL CREDITS	16	TOTAL CREDITS	15

JUNIOR YEAR			
FALL SEMESTER		SPRING SEMESTER	
CHEM 251 Quantitative Analysis	4	CHEM 362 Instrumental Analysis	4
BIOL 331 Microbiology	4	BIOL 332 Genetics	4
NSCI 345 Issues in Medicine	3	NSCI 333 History of Science	3
CHEM 420 Biochemistry	4	BIOL XXX Upper level class	3
ENGL 2XX or 3XX for 2.3M & 3.2L	3	BIOL 215 or 224	4
TOTAL CREDITS	18	TOTAL CREDITS	18

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
ART 211 or ART 250 or HIST 211 (3.2 non-Lit)	3	BIOL XXX Upper level class	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. Serafin for a schedule.

Additional Requirements

Students must meet all Liberal Learning Outcomes 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.