Department of Chemistry

Programs Offered

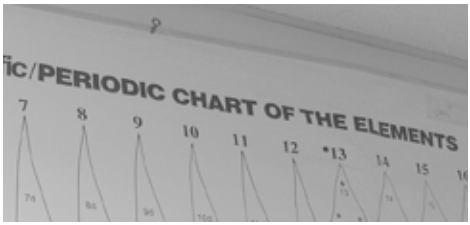
Biochemistry (BS)

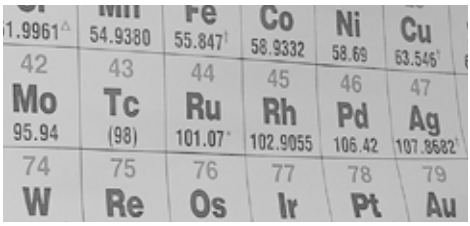
Chemistry (BA)

Chemistry (BS)

Chemistry Minor

Teacher Certification





Faculty

Melinda Ekkens-Villanueva, *Chair*
Marlon Rhem
Melvin Roberts

Mission Statement

Our mission is to provide an atmosphere of mentorship for the purpose of educating and producing well-rounded individuals who are socially, spiritually, and academically mature.

Information About the Program

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Introduction

Chemistry is one of the fundamental sciences for many areas of study. It provides exciting opportunities to investigate the interface between the real, observable world around us and the abstract realm of ideas. Combining experimental observations with theoretical deductions challenges the chemist to find a new understanding of our universe with a well-defined, ever-growing system of concepts. The order, symmetry and unity of the universe become clearer through the study of chemistry, which correlates scientific discovery with knowledge.

Objectives

1. To provide excellent teachers that will assist students in learning the basic concepts and theories associated with the disciplines of chemistry.
2. To assist students' development of critical thinking skills including an understanding of the strengths and weaknesses of the scientific process.
3. To show students observations in the natural world that would lead them to the conclusion of a universal Creator.
4. To have students who are able to integrate and apply their chemical understanding to the world around them.
5. To improve students' abilities to effectively communicate their ideas in both written and verbal formats.
6. To help students see the importance of using their knowledge and talents in service to others and encouraging them to contribute in significant ways to society and the church, as professionals and as citizens.
7. To mentor and advise students in their collegiate experience.
8. To give students the opportunity to gain experience through employment
9. To continually evaluate and improve the Chemistry program.

Career Opportunities

A chemistry major provides excellent preparation for students who wish to prepare for careers as biochemists, chemical engineers, chemists, dentists, medical technologists, pharmacists, physicians, and science teachers. Inasmuch as many of these careers require further study at the graduate or professional school level, the chemistry programs are designed to provide a broad and strong background in chemistry.

Admission Information

Students entering the chemistry department are expected to have a strong background in science and mathematics. Secondary school courses in algebra I and II, trigonometry, chemistry, biology, and physics are strongly recommended. At the beginning of each fall semester the results of the math placement test along with SAT/ACT scores in mathematics and natural sciences are used for placement in college-level chemistry courses. See Course Descriptions section for prerequisites for various courses.

Departmental Requirements

Eligibility to Remain in the Program

The Department of Chemistry reserves the right to administratively withdraw a student if, for any reason, the student's scholastic achievement, mental health, integrity, and/or ability to work with people proves unsatisfactory.

Progression Requirements

a. All chemistry and biochemistry students must have a cumulative GPA of 2.50 or higher upon attaining junior class standing.
b. All chemistry and biochemistry students must achieve at least a "C" grade in all required chemistry and cognate courses.
c. Chemistry and biochemistry students must repeat any required chemistry or cognate course in which a "WF", "WP", or grade lower than "C" is received. A student may not repeat any required chemistry or cognate course more than once, nor may he or she repeat more than two courses within the chemistry and cognate areas of study.

Bachelor of Science in Biochemistry

Biochemists apply principles of chemistry, biology, and physics to develop an understanding of complex molecular mechanisms in living systems. The program in biochemistry is designed to prepare students for (1) graduate studies in biochemistry, (2) a research or teaching career, (3) employment in the biotechnology industry, (4) work in the environmental sciences, or (5) entrance into medical school.

Biochemistry Major		41 hours
CHEM 151	College Chemistry	4
CHEM 152	College Chemistry	4
CHEM 221	Organic Chemistry	4
CHEM 222	Organic Chemistry	4
CHEM 331	Quantitative Analysis	4
CHEM 332	Quantitative Analysis	4
CHEM 421	Physical Chemistry	4
CHEM 422	Physical Chemistry	4
CHEM 461	Biochemistry	3
CHEM 462	Biochemistry	3
CHEM 463	Biochemistry Lab	1
CHEM 464	Biochemistry Lab	1
CHEM 491	Senior Seminar	1
Required Cognates		**29 hours**
BIOL 161	College Biology	4

BIOL 162	College Biology		4
MATH 126	Pre-calculus (or equivalent)		4
MATH 151	Contemporary Calculus I		4
MATH 252	Contemporary Calculus II		4
PHYS 281; 282	Physics for Scientists & Engineers	–OR-	4; 4
PHYS 271; 272	College Physics		4; 4
COOP 210	Introduction to Career Planning		1
COOP 351	Parallel Work Experience	–AND/OR-	0
COOP 360	Alternating Work Experience		0

NOTE: Please consult the Cooperative Education Program for more details.

Recommended Cognates

BIOL 330	Animal Physiology	4
MATH 110	Probability and Statistics	4

General Education — 43 hours

(See details under section on General Education Program.)

ENGL 101	Composition	3
ENGL 102	Research and Literature	3
COMM 105	Introduction to Human Communication	3
CPTR 105	Introduction to Computers	3
INTD 105	First-Year Experience	1
RELB/RELT	Religion Electives	12
PSYC 105	Introduction to Psychology –OR-	
SOCI 105	General Sociology	3
HIST	History Elective	3
	Social Science Elective	3
LITR	Literature Elective	3
	Humanities Elective	3
PEAC	Phys Ed Activity Elective	1
	Health Elective	2

Electives — 15 hours

Upper division electives must total at least 36 hours.

Total — 128 hours

Bachelor of Arts in Chemistry

The Bachelor of Arts program in chemistry allows the student an opportunity to engage in a broad course of studies in the liberal arts. A minor or second major is required.

Chemistry Major			35 hours
CHEM151	College Chemistry		4
CHEM152	College Chemistry		4
CHEM221	Organic Chemistry		4
CHEM222	Organic Chemistry		4
CHEM331	Quantitative Analysis		4
CHEM332	Quantitative Analysis		4
CHEM421	Physical Chemistry		4
CHEM422	Physical Chemistry		4
CHEM	Upper division chemistry elective		3
Required Cognates			**42 hours**
MATH126	Pre-calculus (or equivalent)		4
MATH151	Contemporary Calculus I		4
MATH252	Contemporary Calculus II		4
PHYS281; 282	Physics for Scientists & Engineers	–OR-	4; 4
PHYS271; 272	College Physics		4; 4
Recommended Cognates			
CPTR 150	Computer Science I		4
COOP 210	Introduction to Career Planning		1
COOP 351	Parallel Work Experience	–AND/OR-	0
COOP 360	Alternating Work Experience		0

NOTE: Please consult the Cooperative Education Program for more details.

General Education			46 hours
(See details under section on General Education Program.)			*Computer proficiency is required.*
ENGL 101	Composition		3
ENGL 102	Research and Literature		3
COMM105	Introduction to Human Communication		3
INTD 105	First-Year Experience		1
RELB/RELT	Religion Electives		12
PSYC 105	Introduction to Psychology	–OR-	
SOCI 105	General Sociology		3
HIST	History Elective		3
	Social Science Elective		3
LITR	Literature Elective		3
	Humanities Elective		3

PEAC	Physical Education Activity Elective	1
	Health Elective	2
	Modern Language (intermediate level)	6

NOTE: If elementary proficiency is not met, add six more hours.

Electives	27 hours

Upper division courses must total at least 36 hours.

NOTE: A minor or second major is required.

Total	128 hours

Bachelor of Science in Chemistry

The Bachelor of Science program provides more extensive training in chemistry than does the BA program. Because of its importance in the sciences, computer languages are an integral part of the BS in chemistry. The Bachelor of Science program provides more thorough training for students pursuing graduate study or employment in the field of chemistry.

Chemistry Major		40 hours
CHEM151	College Chemistry	4
CHEM152	College Chemistry	4
CHEM221	Organic Chemistry	4
CHEM222	Organic Chemistry	4
CHEM331	Quantitative Analysis	4
CHEM332	Quantitative Analysis	4
CHEM340	Inorganic Chemistry	3
CHEM421	Physical Chemistry	4
CHEM422	Physical Chemistry	4
CHEM491	Senior Seminar	1
CHEM	Upper division electives	4

Required Cognates			31 hours
MATH126	Pre-calculus (or equivalent)		4
MATH151	Contemporary Calculus I		4
MATH252	Contemporary Calculus II		4
PHYS281; 282	Physics for Scientists & Engineers	–OR–	4; 4
PHYS271; 272	College Physics		4; 4
COOP 210	Introduction to Career Planning		1
COOP 350	Parallel Work Experience	–AND/OR-	0
COOP 360	Alternating Work Experience		0

NOTE: Please consult the Cooperative Education Program for more details.

CPTR 115	Introduction to Computer Science	3

CPTR 150	Computer Science I	4
	Upper division Math or	3
	Computer Science Elective	

Recommended Cognates

MATH 319	Differential Equations	3
PHYS 320	Elementary Modern Physics	3

General Education **40 hours**

(See details under section on General Education Program.)

ENGL 101	Composition	3
ENGL 102	Research and Literature	3
COMM 105	Introduction to Human Communication	3
INTD 105	First-Year Experience	1
CPTR 150	Computer Science I	4
RELB/RELT	Religion Electives	12
PSYC 105	Introduction to Psychology –OR–	
SOCI 105	General Sociology	3
HIST	History Elective	3
	Social Science Elective	3
LITR	Literature Elective	3
	Humanities Elective	3
PEAC	Phys Ed Activity Elective	1
	Health Elective	2

Electives **17 hours**

Upper division courses must total at least 36 hours.

Total **128 hours**

Chemistry Minor

Chemistry Minor **18 hours**

CHEM 151	College Chemistry	4
CHEM 152	College Chemistry	4
CHEM	Upper division chemistry electives	6
CHEM	Other chemistry electives	4

(CHEM 221 Organic Chemistry required for prospective teachers.)

Teacher Certification

Students wishing to enter the science teaching program at the secondary level should complete a major in chemistry or biochemistry and a minor in secondary education. Consult the advisor concerning special course requirements for chemistry education.