CHEMISTRY & BIOCHEMISTRY

Halenz Hall, Room 225
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A	
BS: Chemistry	38
BS: Chemistry (Approved by the American Chemical Society (ACS) Committee on Professional Training)	44
BS: Biochemistry (Approved by the American Chemical Society (ACS) Committee on Professional Training)	45
BS: Biochemistry	34
Minor in Chemistry	20

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The mission of the Department of Chemistry & Biochemistry within the context of a Seventh-day Adventist Christian worldview is to assist all students to excel in developing their analytical and critical reasoning skills, using fundamental chemical principles and computational methods; prepare our chemistry and biochemistry majors to enter graduate school, professional school, the chemical industry, or the teaching profession, in a diverse world; develop in our students an understanding of responsible, environmentally sensitive use of global resources; engage students and faculty in the process of discovery and creativity in the research lab and the classroom to model a life of personal and professional integrity.

Students who plan to major in chemistry or biochemistry are expected to have entrance credit in the preparatory subjects of chemistry and mathematics (including algebra and trigonometry); a background in physics is desirable. Those who do not have entrance credit or equivalent training in these subjects, particularly mathematics, may not fulfill the department graduation requirements in four years.

Students are encouraged to plan early for an on-campus

BS: B (34)

Core plus BCHM422, 430.

: BIOL165, 166; MATH141, 142; PHYS141, 142 (or PHYS241, 242, 271, 272); and two courses selected from BIOL371, 372; FDNT485; ZOOL315, 464, 465.

Students desiring a career in biochemistry might be better served by pursuing the ACS Bachelor of Science degree in biochemistry, but the Bachelor of Science degree in biochemistry can be strengthened by the addition of CHEM415, 440, and 495.

M C (20)

CHEM131, 132, 231, 232, 241, 242, plus 4 credits of majors level chemistry or biochemistry.

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The Department of Chemistry & Biochemistry collaborates in offering the MS: Mathematics and Science with the departments of Mathematics, Biology, and Physics. See the program description under Mathematics and Science, p. 171.

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See inside front cover for symbol code.

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I d B g ca C e

A survey of major concepts in biochemistry such as structures of biological molecules, their functions, energy metabolism, regulation of biochemical pathways; for nursing, dietetics, and allied health students. Weekly: 3 lectures, 1 recitation, and a 3-hour lab. Not applicable towards a major or minor in chemistry or biochemistry. Prerequisite: CHEM110[(B)i2(S)-5(cienc)10mfiil(.4830))Tj0Sp-22g1 Tf08.52.588 T-l(.4830[(B)-10(dH)-10(M0)-15(5)-22(-(74 <ActualText (5)>

Organic Chemistry Laboratory II (1 unit)
Experiments related to the course content of CHEM232. Weekly one 4-hour laboratory. Prerequisite: CHEM232 or concurrent enrollment in CHEM232. *Spring*

Laboratory Glassblowing (1 unit)
Practice of fundamental glassblowing skills common to both scientific and creative glass blowing. Two projects are required. The student may choose between scientific and creative projects. Weekly: 1 lecture demonstration and 4 hours of lab. Not applicable towards a major or minor in chemistry or toward the General Education requirement in natural science. Offered *Fall* (even years or as needed)

Seminar (0 units)
Departmental seminar series devoted to topics in current chemical research by students, faculty, and guest speakers. This course is required of, and open only to, junior chemistry and biochemistry majors, and attendance for both semesters is required for one credit; freshmen and sophomores are encouraged to attend. Grading is on an S/U basis. A deferred grade (DG) is assigned Fall Semester and is removed upon successful completion of CHEM312. Weekly: 1 seminar. Prerequisite: CHEM232. *Fall*

Seminar (0 units)
Continuation of CHEM311. This course is required of, and open only to, junior chemistry and biochemistry majors; freshmen and sophomores are encouraged to attend. Grading is on S/U basis. Weekly: 1 seminar. Prerequisite: CHEM311. *Spring*

Environmental Science (1 unit)
A survey of environmental and energy-related problems. Topics include air, soil, and water pollution, energy and other resources, solid wastes and recycling, and toxic chemicals. Weekly: 3 lectures and one 4-hour lab. Not applicable towards a major in chemistry or biochemistry. Prerequisites: CHEM132; CHEM232 or CHEM200 strongly recommended. *Spring* (odd years or as needed)

Forensic Science (1 unit)
Principles of chemistry as applied to the methods of analysis and identification of drugs. Rules of evidence as they apply to testimony in court. Observation of drug-related court procedures. Weekly: 1 lecture and two 3-hour labs. Participation must be arranged with the instructor at least 2 months prior to beginning of course. Prerequisites: CHEM200, 232. *Spring*

Seminar (0 units)
First half of semester consists of two meetings per week: one is an introduction to chemical literature and computer searching of Chemical Abstracts and chemical databases, the other meeting is the regular seminar series presented by students, faculty, and invited speakers. During the semester, each student prepares and presents a seminar. This course is required of, and open only to, senior chemistry and biochemistry majors, and attendance for both semesters is required for one credit. A deferred grade (DG) is assigned fall semester and is removed upon successful completion of CHEM412. Weekly: Two meetings during first half of semester, one meeting remainder of semester. Prerequisite: CHEM312. *Fall*

Seminar (0 units)
Continuation of CHEM411. During the semester, each student prepares and presents a seminar. This course is required of, and open only to, seniors. Prerequisite: CHEM411. *Spring*

Advanced Inorganic Chemistry (1 unit)
Atomic and molecular structure, symmetry, group theory, solid state, acids and bases; structure, bonding, spectra, and reaction mechanisms of d-metal complexes, systematic chemistry of non-metals; organometallic chemistry and catalysis. Weekly: 4 lectures. Prerequisites: CHEM232, 431. *Spring*

Physical Chemistry I (1 unit)
Fundamental concepts in chemical thermodynamics, free energy, chemical equilibria, phase changes, solutions, molecular transport, chemical dynamics, and electrochemistry. Weekly: 3 lectures. Prerequisites: CHEM200, MATH142, PHYS142 (or 242, 272). *Fall*

Physical Chemistry II (1 unit)
Wave mechanics, atomic and molecular structure, chemical bonding, atomic and molecular spectroscopies, and applications to chemical dynamics and statistical thermodynamics. Weekly: 3 lectures. Prerequisites: CHEM431, MATH286; MATH240 strongly recommended. *Spring*

Instrumental Analysis (1 unit)
Theory and practice of analytical separations and chemical analyses by chromatographic, optical, and electrochemical methods. Introduction to interface of instruments with microcomputers. Instruments used include emission and absorption spectrometers, lasers, mass spectrometer, chromatographs, microcomputers, analog and digital devices. Weekly: 2 lectures and two 4-hour labs. Prerequisites: CHEM200, MATH142. *Fall*

Physical Chemistry Laboratory I (1 unit)
Experiments related to the course content of CHEM431. Weekly: one 4-hour laboratory. Prerequisite: concurrent enrollment in CHEM431. *Fall*

Physical Chemistry Laboratory II (1 unit)
Experiments related to the course content of CHEM432. Weekly: one 4-hour laboratory. Prerequisite: concurrent enrollment in CHEM 432. *Spring*

Modern Synthetic Techniques (1 unit)
An advanced laboratory course designed to incorporate a wide variety of modern synthetic techniques of organic, organometallic, and inorganic chemistry. Weekly: two 4-hour labs. Prerequisites: CHEM474,415 or concurrent enrollment in CHEM415. *Spring*