

BIOL699

Repeatable to 6 credits. *A*

(3) **CHEMISTRY AND
BIOCHEMISTRY**

Halenz Hall, Room 225
(269) 471-3247 or 471-3248
chemistry@andrews.edu
<http://www.andrews.edu/CHEM/>

Faculty

G. William Mutch, *C*
David E. Alonso
Getahun Merga
Desmond H. Murray
D. David Nowack
Steven E. Warren
Peter A. Wong

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 or off-campus research experience required of all students in the Bachelor of Science degree programs in chemistry and strongly recommended for those in the Bachelor of Science degree program in biochemistry. This experience may take the form of a cooperative educational-research experience or research in an academic, industrial, or governmental laboratory setting. Interested students should consult the department chair.

AMERICAN CHEMICAL SOCIETY CERTIFICATION

- Students desiring American Chemical Society certification must
- Complete the required courses for the (ACS) Bachelor of Science degree in chemistry as spelled out in this bulletin
 - Achieve a minimum GPA of 3.00 in all chemistry courses taken at Andrews University
 - Satisfactorily complete a research or cooperative educational experience in chemistry
 - Pass at least one advanced course selected from the following: CHEM470, 474 or 475.

A complete statement of certification requirements is available from the department chair.

Undergraduate Programs

Core Courses—30

CHEM131, 132, 200, 231, 232, 241, 242, 311, 312, 411, 412, 431, 441, BCHM421

BS: Chemistry—38

Major Requirements: Core plus CHEM415, 440.

Research/Cooperative Experience: An on-campus or off-campus research or cooperative educational experience. The student may satisfy this requirement by matriculating in CHEM495, HONS497, 498 or IDSC380.

Cognate Courses: CPTR125 or CPTR151; MATH141, 142; PHYS241, 242, 271, 272.

BS: Chemistry—44

(American Chemical Society approved)

Major Requirements: Core plus CHEM440, 415, 432, 442; and one course selected from the following: CHEM470, 474, or 475.

Research/Cooperative Experience: An on-campus or off-campus research or cooperative educational experience. The student may satisfy this requirement by matriculating in CHEM495, HONS497, 498 or IDSC380.

Cognate Courses: MATH141, 142, 286; CPTR125 or CPTR151; PHYS241, 242, 271, 272.

Courses in economics and marketing are strongly recommended. A reading knowledge of German or French, although not required for professional undergraduate education in chemistry, is strongly recommended for students planning advanced study.

BS: Biochemistry—34

Major Requirements: Core plus BCHM422, 430.

Cognate Courses: 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 adding the biochemistry courses to the Bachelor of Science degree in chemistry, but the Bachelor of Science degree in biochemistry

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electrochemistry, and an introduction to instrumental methods.
Weekly: 2 lectures and two 4-hour labs. Prerequisites: CHEM132.

F

CHEM231 (3)

L C I

The chemistry of carbon-containing compounds with emphasis on nomenclature, molecular structure, spectra-structure relationships, and a mechanistic approach to organic reactions. Weekly: 3 lectures and 2 recitations. Prerequisites: CHEM132. F

CHEM232 (3)

L C II

This course is a continuation of CHEM231. Weekly: 3 lectures and 2 recitations. Prerequisites: a grade of C- or better in CHEM231.

CHEM241 \$ (1)

L C L I

Experiments related to the course content of CHEM231. Weekly: one 4-hour laboratory. Prerequisite: CHEM231 or concurrent enrollment in CHEM231. F

CHEM242 \$ (1)

L C L II

Experiments related to the course content of CHEM232. Weekly one 4-hour laboratory. Prerequisite: CHEM232 or concurrent enrollment in CHEM232.

CHEM300 Alt \$ (2)

L G

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 F (even years or as needed)

CHEM311 (.5)

C

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

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one 4-hour laboratory. Prerequisite: concurrent enrollment in CHEM431. *F*

CHEM442 § § (1)
C L II

Experiments related to the course content of CHEM432. Weekly: one 4-hour laboratory. Prerequisite: concurrent enrollment in CHEM 432.

CHEM470 § § (2)

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.

CHEM474 (2)
A L C

Study of the principles of modern synthetic organic chemistry with applications from one or more of the following areas: natural product, medicinal, or polymer chemistry. Weekly: 2 lectures. Prerequisite: CHEM232. *F*

CHEM475 § (2)
A C

Advanced study of molecular spectroscopy, statistical thermodynamics, chemical dynamics, or the application of quantum mechanics. Prerequisites: CHEM432 or CHEM431 and permission of the instructor.

CHEM495 § (1-4)
I

An opportunity for chemistry and biochemistry majors to gain research experience by joining with a faculty member in study of an area of special interest.

GRADUATE

CHEM530 (2-4)
C

Each time the course is offered, it treats one of the following areas:

- Concepts in Chemistry
Fundamental ideas of chemistry
- Demonstrations
Simple experiments which illustrate chemical principles
- Problem-Solving Strategies
Exploration into the mental processes and logic behind problem solving.

None of the above areas are to occur twice in one student's program. Prerequisite: CHEM232. Repeatable to 6 credits.

CHEM540 (2-4)
C

Independent readings to be chosen in consultation with the instructor. A written report and an oral presentation covering the materials read are required. A minimum of 60 hours of work is required for each credit. Prerequisites: CHEM431. Repeatable to 6 credits.

CLINICAL AND LABORATORY SCIENCES

Halenz Hall, Room 326
(269) 471-3336
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<http://www.andrews.edu/ALHE>

Faculty

Marcia A. Kilsby, *C CL D*
Albert W. McMullen
Richard D. Show, *G C*

Academic Programs	Credits
BS in Clinical Laboratory Science (BSCLS)	127
BS: Allied Health Administration	65
MS in Clinical Laboratory Science (MSCLS)	32
Biomedical	
Business and Management	
Education	

The Department of Clinical and Laboratory Sciences prepares students who are committed to preserving and protecting the dignity of life and death. They promote values and attitudes consistent with the Seventh-day Adventist Christian lifestyle. They strive to instill in students a life-long personal quest for individual growth and fulfillment and for continual excellence in health-care practice.

Clinical Laboratory Science (Medical Technology)

The degree program includes three years of undergraduate (pre-clinical) studies plus one year (3 semesters) of clinical (professional) education.

Pre-clinical Program. The first three years of undergraduate study include General Education, cognate science, and pre-clinical degree requirements. Program options feature directed elective course work selected in consultation with the faculty advisor according to the student's career goals and interests.

Clinical (Professional) Program. The year of clinical studies is comprised of lectures and student laboratories on the Berrien Springs campus and clinical practica at an affiliated hospital or clinical laboratory site.

Clinical Experience (Practica). Students work side-by-side with practicing professionals in patient health care during the final portion of the clinical year. Andrews University maintains a number of affiliations with clinical institutions across the country. Student preferences for clinical site assignments are solicited and granted when possible. Final site assignments are made at the discretion of the faculty.

Clinical Year Admission Requirements. An independent admissions process is required for university students who wish to enter clinical studies. Application forms may be obtained from the Department of Clinical and Laboratory Sciences office. Students should complete these applications and return them to the depart-