

# B.A. in CHEMISTRY - Biochemistry

(32 credits required for graduation with a minimum cumulative GPA of 2.00)

**NOTE:** This guide is not meant to replace the degree audit; it is subject to change and represents actions approved by Faculty to date. Students are encouraged to run their degree audit at the end of each term of enrollment. Please refer often to the *2018-2019 Online Catalog & Student Handbook* <http://catalog.berea.edu/en/current/catalog>, which will be updated with the most current information.

## GENERAL EDUCATION PROGRAM

*No single transfer course can meet more than one General Education requirement.*

### Core Courses

*(Developmental math courses may be waived on basis of test scores.)*

MAT 010 Pre-Algebra  
MAT 011 Elementary Algebra  
MAT 012 Elementary Algebra II

GSTR 110 Writing Seminar I: Critical Thinking in the Liberal Arts *(Transfer students may waive if College Composition was taken as a degree-seeking student at another college and earned a grade of B or higher.)*

GSTR 210 Writing Seminar II: Identity and Diversity in the U.S.

GSTR 310 Understandings of Christianity

GSTR 410 Seminar-Contemporary Global Issues

### Scientific Knowledge and Inquiry

GSTR 332 Scientific Origins **OR**

Two (2) approved science courses, from two different disciplines, one of which must be an approved lab course. The following courses have been approved to meet this requirement: ANR 110, BIO 100, 101, 110, CHM 113, 131, PHY 111, 127, 221

### Wellness & Fitness

WELL 101 Principles of Wellness I

WELL 102 Principles of Wellness II

Two (2) ¼-credit HHP activity courses (*HHP 200 will satisfy both the SWIM requirement and one of the activity course requirements*)

### Practical Reasoning (PR &PRQ)

Two (2) courses, at least one firmly grounded in math or statistics (PRQ); the other can be an approved practical reasoning (PR) course or another PRQ course.

### Perspectives (Six areas required)

One (1) course in **each** of the six areas is required.

Individual courses may be approved to satisfy more than one perspective, but no single course may satisfy more than two perspective areas.

- 1) Arts
- 2) Social Science
- 3) Western History
- 4) Religion
- 5) African American/Appalachian/Women
- 6) International (choose one option):
  - A) Two (2) courses in the same non-English language, one of which may be waived through testing; **OR**
  - B) Two (2) world culture courses, one of which must be grounded in a non-western culture

### Active Learning Experience

An approved experience, taken for credit or non-credit (e.g. internships, undergraduate research experiences).

## MAJOR REQUIREMENTS

*A minimum GPA of 2.0 in the major is required for graduation.*

### Core Courses

*(Credit cannot be received for both CHM 131 and 134. All majors must pass a departmental proficiency exam administered in CHM 471. As part of the lab component, students maintain a portfolio {see Catalog & Student Handbook} and are required to make at least two oral presentations—one on & one off campus.)*

CHM 131 Accelerated General Chemistry **OR**

CHM 134 Accelerated Environmental Chemistry

CHM 221 Organic Chemistry I

CHM 222 Organic Chemistry II

CHM 311 Analytical Chemistry

CHM 340 Biochemistry I

CHM 361 Thermochemistry

CHM 370 Advanced Lab Chromatography (½ credit)

CHM 371 Advanced Lab Spectroscopy (½ credit)

BIO 441 Cell & Molecular Biology

CHM 440 Biochemistry II

CHM 470 Advanced Lab Nuclear Magnetic Res (½ credit)

CHM 471 Advanced Synthesis Laboratory (½ credit)

### Capstone Course

Experiences include CHM 398/498 or an approved research project **AND** fulfill the ALE requirement. A formal report of the project must be submitted.

### Required Collateral Courses (count outside the major)

*(Students with a strong mathematics background may waive PHY 127/128, then take the calculus-based physics sequence of PHY 221/222 instead.)*

PHY 127 General Physics I **OR**

PHY 221 Introductory Physics I w/Calculus

PHY 128 General Physics II **OR**

PHY 222 Introductory Physics II w/Calculus

BIO 110 Modern Biology

MAT 135 Calculus I (or waiver)

**Note:** Students who plan to attend graduate school in any area related to chemistry should take **both** CHM 361 and 362. Some graduate programs in chemistry require a reading knowledge of a second language. Students without this knowledge are encouraged to satisfy this requirement by completing Perspective 6A (language requirement).

### Electives

20 credits outside the major

### ***Learning Goal 1: Build Chemistry Knowledge & Laboratory Skills***

Learning Outcome 1.1: Students will demonstrate knowledge in all major fields of chemistry including organic, inorganic, physical, analytical, biochemistry, and polymer chemistry.

Learning Outcome 1.2: Students will demonstrate laboratory skills and show understanding in all major laboratory techniques and principles including instrumentation, synthesis, purification, analysis, and green chemistry.

### ***Learning Goal 2: Build Problem-Solving Methods & Skills***

Learning Outcome 2.1: Students will develop and refine quantitative problem solving skills used in the field of chemistry, enabling them to tackle novel problems with confidence.

Learning Outcome 2.2: Students will employ mathematical methods to model experimental data and solve chemistry problems.

### ***Learning Goal 3. Build Research Skills***

Learning Outcome 3.1: Students will show capacity to use appropriate literature research and parse journal articles for useful information.

Learning Outcome 3.2: Students will be able to maintain an organized and well-documented laboratory notebook.

Learning Outcome 3.3: Students will show proficiency at scientific communication including posters, presentations, laboratory reports, and even journal articles.

Learning Outcome 3.4: Students will learn to take ownership of projects, developing in-depth research questions and formulating activities needed to successfully answer them.

### ***Learning Goal 4. Build Professional Skills and Ethics***

Learning Outcome 4.1: Students will demonstrate creative and independent thinking in both learning and work environments.

Learning Outcome 4.2: Students will learn the value of a professional work ethic including working as part of a diverse team.

Learning Outcome 4.3: Students will develop the ability to recognize ethical issues related to the impact of technological advances on society.