

# CHEMISTRY AND BIOCHEMISTRY

## PROGRAM OVERVIEW

The department of Chemistry and Biochemistry at Capital provides students with a strong foundation in chemical content and laboratory, problem solving, data analysis, and teamwork. The department offers six different majors: chemistry, biochemistry, chemistry pre-pharmacy, ACS certified chemistry, chemistry pre-medicine, and a chemistry engineering dual degree. Each of these are tailored to the professional aspirations of our students. The education department also offers a chemistry and science education major with education licensure.

## CAREERS AND PLACEMENT

Graduates of Capital's department of chemistry and biochemistry typically pursue one of three paths: seek a job in a chemically-related field, obtain a graduate degree (MS, PhD) in science, engineering, or forensics, or pursue professional school (MD, DO, PharmD, etc.). Recent graduates have secured jobs with Chemical Abstract Services, Battelle Institute, and Hikma Pharmaceuticals, among others. Other graduates have recently pursued a Ph.D. degree at The Ohio State University, the University of Iowa, Emory University, and more. For professional school, recent graduates have attended the University of Cincinnati's College of Medicine, Ohio University's College of Osteopathic Medicine, Toledo University's College of Medicine, and The Ohio State University's School of Optometry. A number of pre-professional pathways are also available with your chemistry or biochemistry degree. This degree will start students on a path toward a wide variety of career fields.

## UNDERGRADUATE RESEARCH

Students in the chemistry and biochemistry department have the opportunity to participate in faculty-led research projects. Since there are no graduate students in the sciences at Capital, our undergraduate students "own" these projects and work directly with their faculty mentor. Students can also complete research projects for credit during the school year or as paid scholars in the summer via Departmental Scholars, or as Summer Scholars. Students present their findings at local, regional, and national meetings.

## AS A GRADUATE, YOU WILL BE PREPARED TO:

- Demonstrate an understanding of chemical principles by describing chemical theories, analyzing chemical information, solving chemical problems, and applying chemistry to related areas of study
- Demonstrate a broad understanding of the sub-disciplines of chemistry: analytical, biochemistry, inorganic, organic, and physical
- Communicate chemical information effectively, both orally and in written form
- Identify and apply proper chemical laboratory practices and safety protocols

## WHAT ARE OUR GRADS DOING NOW?

- Pursuing a Ph.D. in Chemistry or Biochemistry
- Studying to become a pharmacist
- Working as a Research Scientist
- Completing a medical residency
- Studying to become a dentist
- Working as a Staff Scientist, Chemical Abstract Services
- Working as an optometrist
- Working as a Forensic Scientist
- Practicing Medicine
- Teaching Chemistry at the high school or collegiate level

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## Four-Year Sample Schedule of a Chemistry Major

### First Year Fall

14 credit hours  
Chemical Principles I - 3  
Chemical Principles I Lab - 1  
Calculus I - 4  
Signature Learning - 3  
Signature Learning - 3

### Second Year Fall

15 credit hours  
Organic Chemistry I - 3  
Organic Chemistry I Lab - 1  
Chemical Analysis I  
with Lab - 4  
Physics I with Lab - 4  
Signature Learning - 3

### Third Year Fall

11 credit hours  
Inorganic Chemistry  
with Lab - 4  
Biochemistry I - 3  
Chemistry Seminar - 1  
Signature Learning - 3

### Fourth Year Fall

8 credit hours  
Physical Chemistry I  
with Lab - 4  
Chemistry Seminar - 1  
Signature Learning - 3

### First Year Spring

14 credit hours  
Chemical Principles II - 3  
Chemical Principles II Lab - 1  
Calculus II - 4  
Signature Learning - 3  
Signature Learning - 3

### Second Year Spring

11 credit hours  
Organic Chemistry I - 3  
Organic Chemistry I Lab - 1  
Physics II with Lab - 4  
Signature Learning - 3

### Third Year Spring

11 credit hours  
Chemical Analysis II  
with Lab - 4  
Oral Exam - 1  
Computational Science - 3  
Signature Learning - 3

### Fourth Year Spring

8 credit hours  
Physical Chemistry II  
with Lab - 4  
Chemistry Seminar - 1  
Signature Learning - 3

## Four-Year Sample Schedule of a Biochemistry Major

### First Year Fall

18 credit hours  
Chemical Principles I - 3  
Chemical Principles I Lab - 1  
Foundations of Modern  
Biology I with Lab - 4  
Calculus I - 4  
Signature Learning - 3  
Signature Learning - 3

### Second Year Fall

15 credit hours  
Organic Chemistry I - 3  
Organic Chemistry I Lab - 1  
Genetics with Lab - 4  
Physics I with Lab - 4  
Signature Learning - 3

### Third Year Fall

15 credit hours  
Chemical Analysis I  
with Lab - 4  
Physical Chemistry I  
with Lab - 4  
Biochemistry I - 3  
Chemistry Seminar - 1  
Signature Learning - 3

### Fourth Year Fall

11 credit hours  
Inorganic Chemistry  
with Lab - 4  
Chemistry Seminar - 1  
Advanced Biology  
Elective - 3-4  
Signature Learning - 3

### First Year Spring

18 credit hours  
Chemical Principles II - 3  
Chemical Principles II Lab - 1  
Foundations of Modern  
Biology II with Lab - 4  
Calculus II - 4  
Signature Learning - 3  
Signature Learning - 3

### Second Year Spring

11 credit hours  
Organic Chemistry I - 3  
Organic Chemistry I Lab - 1  
Physics II with Lab - 4  
Signature Learning - 3

### Third Year Spring

14 credit hours  
Physical Analysis II  
with Lab - 4  
Biochemistry II - 3  
Computational Science - 3  
Signature Learning - 3

### Fourth Year Spring

9 credit hours  
Chemical Analysis II  
with Lab - 4  
Biochemistry Lab - 1  
Chemistry Seminar - 1  
Signature Learning - 3

All courses subject to availability and advisor approval. All undergraduates must demonstrate that Signature Learning goals have been met. 124 credits are required for graduation and students must be enrolled in 12 credit hours per semester.



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