CHEMISTRY | BIOCHEMISTRY

Chemistry is often called the central science because of the pivotal role it plays in the biological and physical sciences, as well as in engineering, agriculture, medicine, and allied health disciplines. Bachelor’s degree chemists choose from diverse paths for their short-term and lifetime careers, including graduate study in a variety of programs, rewarding employment in industry or government laboratories, professional or law school, or much-needed teaching in high schools.

About this Program

- **College:** Liberal Arts and Sciences
- **Degree:** Bachelor of Science
- **Specializations:** Biochemistry, General Chemistry
- **Credits for Degree:** 120
- **More Info**

To graduate with this major, students must complete all university, college, and major requirements.

Department Information

The Department of Chemistry is a comprehensive department granting bachelor’s, master’s, and Ph.D. degrees with specialization in all areas including biochemistry, nanochemistry, analytical, inorganic, organic, physical, polymer, synthetic and theoretical chemistry. The University of Florida ranks in the top five chemistry departments nationally in Ph.D. production and is among the top 20 in bachelor’s graduates.

Website (https://www.chem.ufl.edu)

CONTACT

Email (chairadmin@chem.ufl.edu) | 352.392.0541 (tel) | 352.392.8758 (fax)

P.O. Box 117200
214 LEIGH HALL
GAINESVILLE FL 32611-7200
Map (http://campusmap.ufl.edu/#/index/0009)

Curriculum

- Chemistry Minor
- Chemistry | Biochemistry

Students can choose the standard chemistry program, which is comparable to that offered in any major university, or the biochemistry program, which is designed to give more flexibility to students wanting to pursue courses with biological focus. The department encourages students in either specialization to include undergraduate research with one of the department’s internationally recognized faculty as a component of the undergraduate experience. Undergraduate research will frequently result in journal publications and/or presentations at scientific meetings.

Coursework for the Major

For either specialization (standard chemistry or biochemistry), all required courses must be completed within two attempts with minimum grades of C. Any foreign language acceptable to the college can be taken with this minimum program and language courses can be taken S-U.

ENC 3254 is suggested to fulfill part of the university writing requirement.

Required Coursework

Required coursework will depend upon the program chosen. Coursework for each specialization can be found below under Critical Tracking and Model Semester Plan.

Recommended Coursework

A.C.S. Certified Program: To receive American Chemical Society certification, a student must complete the standard chemistry major. In addition, credit must be earned for CHM 3610L and CHM 3218 plus an additional two credits of advanced work in chemistry courses such as the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHM 4034</td>
<td>Advanced Biochemistry and Chemical Biology</td>
<td>4</td>
</tr>
<tr>
<td>CHM 4272</td>
<td>The Organic Chemistry of Polymers</td>
<td>2</td>
</tr>
<tr>
<td>CHM 4300L</td>
<td>Laboratory in Biochemistry and Molecular Biology</td>
<td>2</td>
</tr>
<tr>
<td>CHM 4304</td>
<td>Chemical Aspects of Cellular Control</td>
<td>3</td>
</tr>
<tr>
<td>CHM 4910</td>
<td>Undergraduate Research</td>
<td>3</td>
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</table>

If CHM 4910 is used, a thesis must be written.

Course Details

Introduction to General Chemistry

CHM 1025, a two-credit course, is offered for students who need to strengthen their understanding of basic concepts of atomic structure and stoichiometry before beginning the general chemistry sequence:

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>CHM 2045</td>
<td>General Chemistry 1</td>
<td>4</td>
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<tr>
<td>&amp; 2045L</td>
<td>and General Chemistry 1 Laboratory</td>
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<tr>
<td>CHM 2046</td>
<td>General Chemistry 2</td>
<td>4</td>
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<tr>
<td>&amp; 2046L</td>
<td>and General Chemistry 2 Laboratory</td>
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</table>

A placement exam is offered via ONE.UF (https://one.uf.edu) and the score achieved determines whether CHM 1025 or CHM 2045 is the appropriate first course in chemistry.

General Chemistry

The following general chemistry offerings are available:

- CHM 1030/CHM 1031 is a terminal sequence for non-science students that presents chemistry from a medical and nursing perspective.
- CHM 1020 is a terminal general education course that explores chemistry in terms of society.
- CHM 2045/CHM 2045L and CHM 2046/CHM 2046L is the standard general chemistry sequence and is an acceptable preprofessional requirement for many science and engineering majors. Students are presumed to have good backgrounds in high school chemistry and mathematics (through MAC 1147) and are expected to pass the placement exam offered via ONE.UF (https://one.uf.edu) before registering for CHM 2045.
• CHM 2095/CHM 2045L and CHM 2096/CHM 2046L is an alternative general chemistry sequence especially designed for engineering majors.

• CHM 2047/CHM 2047L is a one-semester program for entering first-year students with strong backgrounds in chemistry, normally reflected by high AP or IB chemistry test scores. This program enables students to move more quickly into advanced work.

• CHM 2051 is offered as an alternative to CHM 2046 for students who have done particularly well in CHM 2045.

• CHM 2054L is a 2-credit, inquiry-based lab focusing on major concepts in chemistry and their application to quantitative life-sciences research. This course is equivalent to CHM 2045L and CHM 2046L or CHM 2047L.

Placement
For placement into the appropriate first course in chemistry, please refer to the Academic Advising section or consult a chemistry advisor. All students should complete their general chemistry studies at the same institution.

More Info (http://catalog.ufl.edu/UGRD/academic-advising/placement)

Minors and/or Certificates

UFTeach Program
There is a severe shortage of qualified high school chemistry teachers in Florida and nationwide. Students interested in becoming part of this high-demand profession should see a chemistry advisor about the UFTeach program. UFTeach students complete the UFTeach minor in science teaching with their B.S. in chemistry and have the coursework and preparation for professional teacher certification in Florida when they graduate.

More Info (https://education.ufl.edu/uf-teach)

Academic Learning Compact
Chemistry is the study of matter: the structure and properties of matter, the transformations from one form of matter to another and the energy transformations associated with these transformations.

Before Graduating Students Must
• Achieve at least 50% on the Diagnostic of Undergraduate Chemistry Knowledge (DUCK) exam.

• Obtain minimum grades of C in laboratory courses:

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<tr>
<td>CHM 2211</td>
<td>Organic Chemistry 2</td>
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<tr>
<td>CHM 3120L</td>
<td>Analytical Chemistry Laboratory</td>
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<tr>
<td>CHM 4130L</td>
<td>Instrumental Analysis Laboratory</td>
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</tr>
<tr>
<td>CHM 4411L</td>
<td>Physical Chemistry Laboratory</td>
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<tr>
<td>or CHM 4413L</td>
<td>Biophysical Chemistry Laboratory</td>
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• Complete requirements for the baccalaureate degree, as determined by the chemistry faculty.

Students in the Major Will Learn to
Student Learning Outcomes (SLOs)

Content
1.
• Standard Chemistry
  Explain and apply facts, theories and concepts in

  i. physical
  ii. organic
  iii. inorganic
  iv. analytical chemistry

• Biochemistry
  Explain and apply facts, theories and concepts in
  i. physical
  ii. organic
  iii. inorganic
  iv. analytical chemistry
  v. biochemistry

2.
• Standard Chemistry
  Demonstrate and safely apply laboratory skills in
  i. synthetic
  ii. quantitative
  iii. instrumental methods as scientific approaches to gathering and verifying knowledge

• Biochemistry
  Apply laboratory skills in
  i. synthetic
  ii. quantitative
  iii. instrumental
  iv. biochemical methods as scientific approaches to gathering and verifying knowledge

Critical Thinking
3. Standard Chemistry and Biochemistry
  Interpret, evaluate, explain and critically assess theories and experimental results in chemistry or biochemistry.

Communication
4. Standard Chemistry and Biochemistry
  Collect, analyze and articulate results clearly and effectively in both oral and written formats.

Curriculum Map

<table>
<thead>
<tr>
<th>Course</th>
<th>SLO 1-A</th>
<th>SLO 1-B</th>
<th>SLO 1-C</th>
<th>SLO 1-D</th>
<th>SLO 2-A</th>
<th>SLO 2-B</th>
<th>SLO 2-C</th>
<th>SLO 2-D</th>
<th>SLO 3</th>
<th>SLO 4</th>
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<td>CHM 4130L</td>
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R = Introduced; B = Reinforced; A = Assessed
Assessment Types for Both Specializations

- Oral tests or reports
- Written reports
- Lab practicals