

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 (<http://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/>)
- **Degree:** Bachelor of Science
- **Specializations:** Biochemistry (http://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/CHY_BS/CHY_BS01/) | Chemistry (http://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/CHY_BS/CHY_BS_BS/)
- **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 PhD 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 PhD production and is among the top 20 in bachelor's graduates.

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

CONTACT

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Map (<http://campusmap.ufl.edu/#/index/0009>)

Curriculum

- Chemistry Minor
- Chemistry | Biochemistry

Students can choose the Chemistry specialization, which is comparable to that offered in any major university, or the Biochemistry specialization, 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 presentations at scientific meetings.

Requirements for the Majors

The Chemistry major requires a total of 55-60 credits including 25-30 credits of foundation coursework and 30 credits of major coursework.

The Biochemistry major requires a total of 62-69 credits including 29-34 credits of foundation coursework and 33-35 credits of major coursework.

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

For either specialization, all required courses must be completed within two attempts with minimum grades of C.

RECOMMENDED COURSEWORK

The chemistry program at the University of Florida is approved by the American Chemistry Society (ACS). Students completing a baccalaureate degree in the standard Chemistry track may enhance their undergraduate experience by completing an ACS-certified degree. The ACS-certified degree is comprised of foundational coursework from each of the five subdisciplines of chemistry (analytical, biochemistry, inorganic, physical, and organic), as well as additional in-depth courses and laboratory experiences.

The following coursework and lab experiences are necessary to satisfy the requirements for ACS certification:

- Completion of all coursework for the standard Chemistry track
- CHM 3218 (4 credits)

- CHM 3610L (2 credits)
- An additional 4000-level CHM lecture course (2-3 credits)
- An additional 4000-level CHM laboratory course or CHM 4910 (2-3 credits)

Course Details

Introduction to 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:

| Code | Title | Credits |
|---------------------|---|---------|
| CHM 2045 & 2045L | General Chemistry 1 and General Chemistry Laboratory | 4 |
| CHM 2046 & 2046L | General Chemistry 2 and General Chemistry 2 Laboratory | 4 |

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.

Chemistry

The following 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 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 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 chemistry studies at the same institution.

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

Minors and 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 BS 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:

| Code | Title | Credits |
|-----------|----------------------------------|---------|
| CHM 2211 | Organic Chemistry 2 | 3 |
| CHM 3120L | Analytical Chemistry Laboratory | 1 |
| CHM 4130L | Instrumental Analysis Laboratory | 2 |

| | | |
|---------------------------|---|---|
| CHM 4411L or CHM 4413L | Physical Chemistry Laboratory Biophysical Chemistry Laboratory | 2 |
|---------------------------|---|---|

- Complete requirements for the baccalaureate degree, as determined by the chemistry faculty.

Students in the Major Will Learn to

Student Learning Outcomes | SLOs

Content

- **Standard Chemistry**
Explain and apply facts, theories and concepts in
 - physical
 - organic
 - inorganic
 - analytical chemistry
 - **Biochemistry**
Explain and apply facts, theories and concepts in
 - physical
 - organic
 - inorganic
 - analytical chemistry
 - biochemistry
- **Standard Chemistry**
Demonstrate and safely apply laboratory skills in
 - synthetic
 - quantitative
 - instrumental methods as scientific approaches to gathering and verifying knowledge
 - **Biochemistry**
Apply laboratory skills in
 - synthetic
 - quantitative
 - instrumental
 - biochemical methods as scientific approaches to gathering and verifying knowledge

Critical Thinking

- **Standard Chemistry and Biochemistry**
Interpret, evaluate, explain and critically assess theories and experimental results in chemistry or biochemistry.

Communication

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

Curriculum Map

I = Introduced; R = Reinforced; A = Assessed

Standard Chemistry

| Courses | SLO 1-A | SLO 1-B | SLO 1-C | SLO 1-D | SLO 2-A | SLO 2-B | SLO 2-C | SLO 2-D | SLO 3 | SLO 4 |
|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|-------|-------|
| CHM 2045 and CHM 2046 | I | | I | I | | | | | | |
| CHM 2211L and CHM 2213 | | I | | | I, A | | | | | I |
| CHM 3120 and CHM 4130 | | | | R | | | | | | |

| | | | | | | | | | | |
|-------------------------------|---|---|---|---|--|------|------|--|---|------|
| CHM 3120L | | | | | | I, A | I | | | I |
| CHM 3610 | | R | | | | | | | | |
| CHM 4130L | | | | | | R | R, A | | I | R, A |
| CHM 4411 R and CHM 4412 | | | | | | | | | | |
| CHM 4411L | | | | | | R | R | | R | R, A |
| DUCK Exam | A | A | A | A | | | | | | |

Biochemistry

| Courses | SLO 1-A | SLO 1-B | SLO 1-C | SLO 1-D | SLO 1-E | SLO 2-A | SLO 2-B | SLO 2-C | SLO 2-D | SLO 3 | SLO 4 |
|-------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|-------|
| CHM 2045 I and CHM 2046 | | | I | I | | | | | | | |
| CHM 2211L | | | | | | I, A | | | | | I |
| CHM 2212 and CHM 2213 | | I | | | | | | | | | |
| CHM 3120 | | | | R | | | | | | | |
| CHM 3120L | | | | | | | I, A | I | | | I |
| CHM 3218 | | | | | I | | | | | | |
| CHM 3400 R | | | | | | | | | | | |
| CHM 3610 | | | R | | | | | | | | |
| CHM 4300L | | | | | | | | | I | | |
| CHM 4413L | | | | | | | R | R | | R | R, A |
| DUCK Exam | A | A | A | A | | | | | | | |

Assessment Types for Both Specializations

- Oral tests or reports
 - Written reports
 - Lab practicals
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