

Chemistry Major, Biochemistry Specialization

Program Requirements

- **Total units required:** 61-62

Required Courses

To prepare for a major in chemistry with a specialization in biochemistry, students will take the following:

Code	Title	Units
Chem 111A	General Chemistry I *	3
Chem 112A	General Chemistry II *	3
Chem 151	General Chemistry Laboratory I	2
Chem 152	General Chemistry Laboratory II	2
Chem 261	Organic Chemistry I with Lab	4
Chem 262	Organic Chemistry II with Lab	4
Biol 2960	Principles of Biology I	4
Biol 2970	Principles of Biology II	4
Physics 191	Physics I **	3
Physics 191L	Physics I Laboratory **	1
Physics 192	Physics II **	3
Physics 192L	Physics II Laboratory **	1
Math 131	Calculus I ***	3
Math 132	Calculus II ***	3
Math 233	Calculus III ***	3
Total Units		43

* In certain instances, students may substitute Chem 105 Principles of General Chemistry I and Chem 106 Principles of General Chemistry II for Chem 111A General Chemistry I and Chem 112A General Chemistry II. Please consult the department's director of undergraduate studies for details.

** Physics 193 Focused Physics I may replace Physics 191 Physics I, Physics 194 Focused Physics II may replace Physics 192 Physics II, Physics 193L Focused Physics I Laboratory may replace Physics 191L Physics I Laboratory, and Physics 194L Physics II Laboratory may replace Physics 192L Physics II Laboratory.

*** Math 203 Honors Mathematics I may replace both Math 131 Calculus I and Math 132 Calculus II. Math 204 Honors Mathematics II may replace Math 233 Calculus III.

Majors in chemistry with a specialization in biochemistry must take a minimum of 18 units of advanced courses in chemistry or biochemistry, among which the following must be included:

Code	Title	Units
Chem 481	General Biochemistry I	3
Chem 482	General Biochemistry II	3
Chem 401	Physical Chemistry I	3
Chem 402	Physical Chemistry II	3
Chem 461	Inorganic Chemistry	3
Total Units		15

In addition, at least one advanced lab must be chosen from the following list:

Code	Title	Units
Chem 358	Advanced Organic Laboratory	4
Chem 435	Nuclear and Radiochemistry Lab	3
Chem 445	Instrumental Methods: Physical Chemistry	3
Chem 462	Synthetic Polymer Chemistry Laboratory	3
Chem 470	Inorganic Chemistry Laboratory	3
Biol 4522	Laboratory in Protein Analysis, Proteomics, and Protein Structure	3
Biol 4523	Molecular Methods in Enzyme Analysis	4

All required chemistry course work must be taken in residence at Washington University to be applied toward the chemistry major. A minimum grade of C- must be earned in each course to count toward the chemistry major.

Note: Per the College of Arts & Sciences guidelines, for students who also pursue a minor or more than one major or minor program, only introductory (100- and 200-level) courses may be counted, when relevant, toward the requirements of both programs. All advanced (300- and 400-level) courses must be unique to each program. In other words, no advanced course may be "double-counted" for the course work needed to fulfill either program's minimal requirements. Should a student's major and minor programs require the same course, a departmentally sanctioned elective must be chosen to replace the course in one of the programs.

Additional Information

Study Abroad

Study Abroad programs are available both for chemistry and pre-medical studies. Details of these programs can be found at the Overseas Programs website: <http://www.artsci.wustl.edu/~overseas/>. For chemistry programs, you may be able to receive elective/research (Chem 490 Introduction to Research) credit for courses taken/research done abroad. It is strongly advised that you contact the Department of Chemistry Study Abroad Advisor, Prof. Richard Mabbs (mabbs@wustl.edu) as soon as possible after you declare your major to discuss study abroad plans.

Latin Honors for the Major in Chemistry With a Specialization in Biochemistry

- **Total units required:** 64-66

To qualify for Latin Honors, students must complete a minimum of 21 units in advanced courses, including **one** of the following six courses:

Code	Title	Units
Chem 410	Special Topics in Physical Chemistry	3
Chem 453	Bioorganic Chemistry	3
Chem 464	Inorganic Biochemistry	3
Chem 475	Chemical Biology	3
Chem 483	Protein Biochemistry	3
Chem 485	Nucleic Acids	3
Chem 510	Chemical Dynamics of Biological Pathways	3
Biol 334	Cell Biology	3
Biol 349	Microbiology	4

or a second advanced laboratory course in chemistry or biology chosen from the following list:

Code	Title	Units
Chem 358	Advanced Organic Laboratory	4
Chem 435	Nuclear and Radiochemistry Lab	3
Chem 445	Instrumental Methods: Physical Chemistry	3
Chem 462	Synthetic Polymer Chemistry Laboratory	3
Chem 470	Inorganic Chemistry Laboratory	3
Biol 4522	Laboratory in Protein Analysis, Proteomics, and Protein Structure	3
Biol 4523	Molecular Methods in Enzyme Analysis	4

All required chemistry course work must be taken in residence at Washington University to be applied toward the chemistry major. A minimum grade of C- must be earned in each course to count toward the chemistry major.

Departmental Honors for the Major in Chemistry With a Specialization in Biochemistry

To be eligible for Departmental Honors, a student must complete the Latin Honors program in chemistry. To graduate "with distinction," a student must maintain a chemistry grade point average of 3.5 and complete the equivalent of at least 3 units of Chem 490 Introduction to Research. To graduate "with high distinction," a student must maintain a chemistry GPA of 3.65 and complete the equivalent of at least 3 units of Chem 490 and one semester of Chem 495 Advanced Undergraduate Research in Chemistry. To graduate "with highest distinction," a student must maintain a chemistry GPA of 3.8 and complete the equivalent of at least 3 units of Chem 490 and one semester of Chem 495. Chemistry research is defined as a research project performed under the direction

of a chemistry faculty member or a research project approved by the Chemistry Department Undergraduate Work Committee. The chemistry GPA is calculated from the grades received in chemistry courses and prerequisites for the chemistry major. The level of Departmental Honors that a student achieves will appear on the student's final transcript.

**Visit the Chemistry page
for additional information about this program.**

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