

# Chemistry Major

## Program Requirements

- **Total units required:** 53

### Required Courses

To prepare for a major in chemistry, 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
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
<b>Total Units</b>		<b>35</b>

\* 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.

Physics 217 Introduction to Quantum Physics and additional mathematics courses are also recommended. The optional Chem 181 First-Year Opportunity: Why is Chemistry Called "the Central Science"? is open to first-year students, highlighting research activities in the department.

A working knowledge of computer programming and of a foreign language, such as German or Russian, is encouraged for the chemistry major but not required.

Majors in chemistry 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 401	Physical Chemistry I	3
Chem 402	Physical Chemistry II	3
Chem 461	Inorganic Chemistry	3
<b>Total Units</b>		<b>9</b>

In addition, 9 units in chemistry at the 300 level or above must be taken (not including Chem 490 Introduction to Research or Chem 495 Advanced Undergraduate Research in Chemistry). Biol 451 General Biochemistry may be used to complete 3 of these additional 9 units, but not in combination with Chem 481 General Biochemistry I or Chem 482 General Biochemistry II.

At least 3 of these 9 advanced units must be in a laboratory course 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

Neither Chem 490 Introduction to Research nor Chem 495 Advanced Undergraduate Research in Chemistry can be used to satisfy the advanced laboratory requirement.

Students have the advantage of planning their programs with their advisors in accordance with their personal interests. Some graduate courses are also available to seniors.

All 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.

## 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. For chemistry programs, students may be able to receive elective/research (Chem 490 Introduction to Research) credit for courses taken/research done abroad. It is strongly advised that students contact the Department of Chemistry Study Abroad Advisor, Prof. Richard Mabbs (mabbs@wustl.edu), as soon as possible after they declare their major in order to discuss study abroad plans.

### Latin Honors for the Major in Chemistry

- **Total units required:** 56

To qualify for Latin Honors, students must complete a minimum of 21 units in advanced courses in chemistry or biochemistry, among which the following must be included:

Code	Title	Units
Chem 401	Physical Chemistry I	3
Chem 402	Physical Chemistry II	3
Chem 461	Inorganic Chemistry	3

In addition, 6 units in chemistry at the 300 level or above must be taken (not including Chem 490 Introduction to Research). Chem 495 Advanced Undergraduate Research in Chemistry can be used to satisfy 3 of these additional 6 units on the chemistry honors track. Biol 451 General Biochemistry may be used to complete 3 of these additional 6 units but not in combination with Chem 481 General Biochemistry I or Chem 482 General Biochemistry II.

Students must also complete **two** additional advanced laboratories. Students **must** choose one synthetic laboratory from the following:

Code	Title	Units
Chem 358	Advanced Organic Laboratory	4
Chem 462	Synthetic Polymer Chemistry Laboratory	3
Chem 470	Inorganic Chemistry Laboratory	3

They **must** also choose one physical laboratory from the following:

Code	Title	Units
Chem 435	Nuclear and Radiochemistry Lab	3
Chem 445	Instrumental Methods: Physical Chemistry	3

Neither Chem 490 Introduction to Research nor Chem 495 Advanced Undergraduate Research in Chemistry can be used to satisfy the advanced laboratory requirements.

## Departmental Honors for the Major in Chemistry

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.

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