Chemistry

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http://www.slu.edu/x15726.xml

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The Department of Chemistry offers undergraduate and graduate programs designed to meet a wide range of interests. Undergraduate degree programs are available in chemistry, biochemistry, and a dual degree program in engineering and chemistry with Washington University.

Both Bachelor of Arts (B.A.) and Bachelor of Science (B.S.) degrees are available in chemistry and in biochemistry. The B.S. degrees are certified by the American Chemical Society. The B.A. degrees provide more opportunity for double majors, study abroad, and are often used as preparation for professional schools.

The department participates in a dual degree program in Chemical Engineering with Washington University where a student may receive a B.A. in chemistry from SLU and a B.S. in Chemical Engineering from Washington University after 3 years of study at SLU and 2 years at Washington University.

The department has graduate programs leading to an M.S. and a Ph.D. Students may take a combined B.A./M.S. that is completed in 5 years. Depending on individual progress, students in this program may be on a graduate assistantship for the last one or two years of this program. The assistantship provides tuition remission, a monthly stipend, and health insurance.

Chemistry and Biochemistry Continuation Standards
The following standards apply to all new freshmen and transfer students:

- Students must earn C- or better in General Chemistry I (CHEM 1110/1130) and a C- or better in General Chemistry II (CHEM 1120, 1140), or the equivalent in transfer.
- AP score of 5 meets the General Chemistry requirement.
- Students must earn a C- or better in Analytical Chemistry 1 (CHEM 2200).

Students who do not earn a C- in any of the identified courses must re-take the course at SLU in the following semester. If a C- is not earned on the second attempt the student will be dismissed from the major. A student who withdraws from one of these courses on the first attempt thus has one more attempt to earn a C-.

Students must maintain a 2.0 GPA in their major (CHEM) and required related courses (BIOL, PHYS, MATH, etc.) If a student falls below a 2.0 major GPA the student must meet with the Undergraduate Program Director to review their academic performance. If the student cannot raise the major GPA to 2.0 in two semesters, the student will be dismissed from the major.

Non-Course Requirements
All undergraduate majors must complete the requirements for first year and second year mentoring. A student who transfers into the department and does not have opportunity to take one or both of these requirements must take transfer student mentoring to meet the mentoring requirement.

Chemistry Major (Bachelor of Arts)

Major and related courses
32 credits of chemistry are required, including General Chemistry 1 and 2 for Majors with laboratories, Analytical Chemistry 1 with laboratory, Organic Chemistry 1 and 2 with laboratories, Physical Chemistry 1 and 2, Inorganic Chemistry, and 3 credits of a chemistry elective from the 3000, 4000, or 5000 level. Additional related requirements include two semesters of general physics with laboratory, and two semesters of calculus.

Required Courses
CHEM 1130 General Chemistry 1 for Majors 3
CHEM 1115 General Chemistry 1 Laboratory 1
CHEM 1140 General Chemistry 2 for Majors 3
CHEM 1125 General Chemistry 2 Laboratory 1
CHEM 2200 Analytical Chemistry 1 2
CHEM 2205 Analytical Chemistry 1 Laboratory 2
CHEM 2430 Organic Chemistry 1 for Majors 3
CHEM 2440 Organic Chemistry 2 for Majors 3
CHEM 2435 Organic Chemistry 1 Laboratory for Majors 1
CHEM 2445 Organic Chemistry 2 Laboratory for Majors 1
CHEM 4500 Inorganic Chemistry 3
Chemistry Major (Bachelor of Science)

ACS Certified Degree

Major and related courses
48 credits of chemistry including General Chemistry 1 and 2 for Majors with laboratories, Analytical Chemistry 1 and 2 with laboratories, Organic Chemistry 1 and 2 for Majors with laboratories, Organic Spectroscopy, Physical Chemistry 1 and 2 and Physical Chemistry Laboratory, Biochemistry (either General Biochemistry or Biochemistry 1), Inorganic Chemistry, Inorganic Chemistry Laboratory, The Chemical Literature, Math Techniques in Chemistry, plus 3 credits of undergraduate research (at least two semesters) and completion of a thesis. Additional related requirements include two semesters of general physics with laboratory, and two semesters of calculus. For any of the B.S. programs, a combination of MATH 2530 and MATH 3110 can be used as a substitute for CHEM 4300.

Required Courses
- CHEM 1130 General Chemistry 1 for Majors 3
- CHEM 1115 General Chemistry 1 Laboratory 1
- CHEM 1140 General Chemistry 2 for Majors 3
- CHEM 1125 General Chemistry 2 Laboratory 1
- CHEM 2200 Analytical Chemistry 1 2
- CHEM 2205 Analytical Chemistry 1 Laboratory 2
- CHEM 3330 Physical Chemistry 1 3
- CHEM 3340 Physical Chemistry 2 3
- CHEM 3345 Physical Chemistry Laboratory 1
- CHEM 2430 Organic Chemistry 1 for Majors 3
- CHEM 2440 Organic Chemistry 2 for Majors 3
- CHEM 2435 Organic Chemistry 1 Laboratory for Majors 1
- CHEM 2445 Organic Chemistry 2 Laboratory for Majors 1
- CHEM 3100 The Chemical Literature 1
- CHEM 3970 Undergraduate Research ** 3
- CHEM 4500 Inorganic Chemistry 3
- CHEM 4505 Inorganic Chemistry Laboratory 1

- CHEM 4200 Analytical Chemistry 2 3
- CHEM 4205 Analytical Chemistry 2 Laboratory 1
- CHEM 4300 Math Techniques in Chemistry 3
- CHEM 4400 Organic Spectroscopy 3
- CHEM xxxx Choose 1 Biochemistry Course 3
- CHEM 4950 Senior Residency 0
- MATH 1510 Calculus I 4
- MATH 1520 Calculus II 4
- PHYS 1610 Engineering Physics I* 3
- PHYS 1620 Engineering Physics I Laboratory* 1
- PHYS 1630 Engineering Physics II* 3
- PHYS 1640 Engineering Physics II Laboratory* 1

**Students take 3 semesters, 1 credit per semester
*Engineering Physics I and II with lab are recommended for majors unless they are pre-medical. Physics I and II with lab (PHYS 1310, 1320, 1330, 1340) also fulfill the physics requirement and are recommended for pre-medical students.

Dual Degree Program in Chemical Engineering with Washington University

Major and related courses
26 credits of chemistry including General Chemistry for Majors 1 and 2 with laboratories, Analytical Chemistry 1 with laboratory, Organic Chemistry 1 and 2 with laboratories, Physical Chemistry 1 and 2. Additional requirements include Engineering Physics I and II with laboratory, three semesters of calculus, differential equations, introductory biology I with laboratory, and Computer Science. See “Special Programs” for further information on the Dual Degree Program.

Required Courses
- BIOL 1240 Principles of Biology I 4
- BIOL 1245 Principles of Biology I Laboratory 1
- CHEM 1130 General Chemistry 1 for Majors 3
- CHEM 1115 General Chemistry 1 Laboratory 1
- CHEM 1140 General Chemistry 2 for Majors 3
- CHEM 1125 General Chemistry 2 Laboratory 1
- CHEM 2200 Analytical Chemistry 1 2
- CHEM 2205 Analytical Chemistry 1 Laboratory 2
- CHEM 3330 Physical Chemistry 1 3
- CHEM 3340 Physical Chemistry 2 3
- CHEM 3345 Physical Chemistry Laboratory 1
- CHEM 2430 Organic Chemistry 1 for Majors 3
- CHEM 2440 Organic Chemistry 2 for Majors 3
- CHEM 2435 Organic Chemistry 1 Laboratory for Majors 1
- CHEM 2445 Organic Chemistry 2 Laboratory for Majors 1
- CSCI 1060 Computer Science 3
- MATH 1510 Calculus I 4
- MATH 1520 Calculus II 4
- MATH 2530 Calculus III 4
- MATH 3550 Differential Equations 3
- PHYS 1610 Engineering Physics I 3
- PHYS 1620 Engineering Physics I Laboratory 1
- PHYS 1630 Engineering Physics II 3
Biochemistry Major (Bachelor of Arts)

Major and Related Courses
36 credits of chemistry including General Chemistry 1 and 2 for Majors with laboratories, Analytical Chemistry 1 with laboratory, Organic Chemistry 1 and 2 for Majors with laboratories, Physical Chemistry 1 or 2, Biochemistry 1 and 2, Biochemistry Laboratory 1, and two electives at the level of 3000 or higher. Additional courses include two semesters of general physics with laboratory, two semesters of calculus, Principles of Biology I and II with laboratory, Principles of Genetics or other approved upper division biology course.

Required Courses
BIOL 1240 Principles of Biology I 3
BIOL 1245 Principles of Biology I laboratory 1
BIOL 1260 Principles of Biology II 3
BIOL 1265 Principles of Biology II laboratory 1
BIOL 3030 Genetcs (or other upper division) 3
CHEM 1130 General Chemistry 1 for Majors 3
CHEM 1115 General Chemistry 1 Laboratory 1
CHEM 1140 General Chemistry 2 for Majors 3
CHEM 1125 General Chemistry 2 Laboratory 1
CHEM 2200 Analytical Chemistry 1 2
CHEM 2205 Analytical Chemistry 1 Laboratory 2
CHEM 2430 Organic Chemistry 1 for Majors 3
CHEM 2440 Organic Chemistry 2 for Majors 3
CHEM 2435 Organic Chemistry 1 Laboratory for Majors 1
CHEM 2445 Organic Chemistry 2 Laboratory for Majors 1
CHEM 4610 Biochemistry 1 3
CHEM 4615 Biochemistry 1 Laboratory 1
CHEM 4620 Biochemistry 2 3
CHEM 4950 Senior Residency 0
MATH 1510 Calculus I 4
MATH 1520 Calculus II 4
PHYS 1610 Engineering Physics I* 3
PHYS 1620 Engineering Physics I Lab* 1
PHYS 1630 Engineering Physics II* 3
PHYS 1640 Engineering Physics II Lab* 1
CHEM xxxx Upper Level Chemistry Elective 3
CHEM xxxx Upper Level Chemistry Elective 3
CHEM 3330 Physical Chemistry 1 ** 3
OR
CHEM 3340 Physical Chemistry 2 ** 3

** One semester of Physical Chemistry is required. Anyone planning on attending a chemistry-based graduate program is strongly encouraged to take two semesters of Physical Chemistry.

Biochemistry Major (Bachelor of Science) ACS Certified Degree

Major and Related Courses
45 credits of courses in the chemistry department including General Chemistry 1 and 2 with laboratories, Analytical Chemistry 1 with laboratory, Organic Chemistry 1 and 2 with laboratories, Physical Chemistry 1 and 2, Physical Chemistry Laboratory, The Chemical Literature, Biochemistry 1 and 2, Biochemistry Laboratory 1 and 2, Inorganic Chemistry, one upper level elective, and three credits (at least two semesters) of Undergraduate Research and completion of a thesis. Additional courses include two semesters of general physics with laboratory, two semesters of calculus, Principles of Biology I and II with laboratory, Principles of Genetics or other approved upper division biology course.

Required Courses
BIOL 1240 Principles of Biology I 3
BIOL 1245 Principles of Biology I laboratory 1
BIOL 1260 Principles of Biology II 3
BIOL 1265 Principles of Biology II laboratory 1
BIOL 3030 Genetcs (or other upper division) 3
CHEM 1130 General Chemistry 1 for Majors 3
CHEM 1115 General Chemistry 1 Laboratory 1
CHEM 1140 General Chemistry 2 for Majors 3
CHEM 1125 General Chemistry 2 Laboratory 1
CHEM 2200 Analytical Chemistry 1 2
CHEM 2205 Analytical Chemistry 1 Laboratory 2
CHEM 2430 Organic Chemistry 1 for Majors 3
CHEM 2440 Organic Chemistry 2 for Majors 3
CHEM 2435 Organic Chemistry 1 Laboratory for Majors 1
CHEM 2445 Organic Chemistry 2 Laboratory for Majors 1
CHEM 3100 The Chemical Literature 1
CHEM 3970 Undergraduate Research ** 3
CHEM 3330 Physical Chemistry 1 3
CHEM 3340 Physical Chemistry 2 3
CHEM 3345 Physical Chemistry Laboratory 1
CHEM 4500 Inorganic Chemistry 3
CHEM 4610 Biochemistry 1 3
CHEM 4615 Biochemistry 1 Laboratory 1
CHEM 4620 Biochemistry 2 3
CHEM 4625 Biochemistry 2 Laboratory 1
CHEM 4950 Senior Residency 0
CHEM xxxx Upper Level Chemistry Elective 3
MATH 1510 Calculus I 4
MATH 1520 Calculus II 4
PHYS 1610 Engineering Physics I* 3
PHYS 1620 Engineering Physics I Lab* 1
PHYS 1630 Engineering Physics II* 3

* Engineering Physics I and II with lab are recommended for majors unless they are pre-medical. Physics I and II with lab (PHYS 1310, 1320, 1330, 1340) also fulfill the physics requirement and are recommended for pre-medical students.
PHYS 1640 Engineering Physics II Lab* 1

* Engineering Physics I and II with lab are recommended for majors unless they are pre-medical. Physics I and II with lab (PHYS 1310, 1320, 1330, 1340) also fulfill the physics requirement and are recommended for pre-medical students.

**Students take 3 semesters, 1 credit per semester

‡ One of the following is a required elective: Mathematical Techniques in Chemistry, Analytical Chemistry 2, Environmental Chemistry, Medicinal Chemistry, Organic Spectroscopy, or a 5000 level chemistry course.