CHEMISTRY MAJOR

MAJOR DESCRIPTION

The Major in Chemistry provides students with a solid foundation in the chemical sciences and experience with practical laboratory skills. Students will apply the scientific method to develop and test hypotheses, perform lab experiments, critically analyze data, and communicate findings. The Chemistry department offers two pathways for completing the major: The Standard Chemistry Track (A-track) is appropriate for students who are interested in studying chemistry with the breadth and depth of a traditional chemistry major The Biological Chemistry Track (B-track) is intended for students who prefer to focus their studies on biochemistry and chemical biology at the molecular level.

The Chemistry program appeals to students who have a strong interest in science and how matter behaves at the molecular level, have an aptitude for mathematics and data analysis, can grasp abstract concepts, and are attentive to detail and precision.

Chemistry majors typically continue their studies in a doctoral program, medical school, or other advanced education programs, though many students have gone on to pursue diverse career opportunities in fields such as scientific research, chemical engineering, pharmaceuticals, materials science, environmental studies, patent examination, technical writing, forensic science, and education.

ADMISSION TO THE MAJOR

To declare the chemistry major students must have earned a grade of C or better in all 100- and 200-level chemistry courses completed at the time of declaration.

MAJOR REQUIREMENTS

The **Standard Chemistry (A-track)** major requires the following coursework:

Code	Title	Hours
General Chemistry		
CHEM141	General Chemistry I	1
CHEM142	General Chemistry II (General Chemistry)	1
(may be fulfilled using CHEM145 and/or AP credit)		
Organic Chemistry		
CHEM251	Organic Chemistry I	1
CHEM252	Organic Chemistry II	1
Introductory Labs		
CHEM152	Introductory Chemistry Laboratory	0.5
CHEM257	Intermediate Chemistry Laboratory	0.5
CHEM258	Organic Chemistry Laboratory	0.5
Mathematics		
MATH121	Calculus I	1
MATH122	Calculus II	1
(may be fulfilled using AP credit or placement beyond MATH122)		
Physics		
PHYS113	General Physics I	1
PHYS116	General Physics II	1
(may be fulfilled using PHYS111/PHYS112)		
Inorganic Chemistry		
CHEM361	Advanced Inorganic Chemistry	1
(waived for students who completed CHEM144)		
Physical Chemistry		
CHEM337	Physical Chemistry I	1
CHEM338	Physical Chemistry II	1
(MATH221/MATH222 are recommended)		
Advanced Labs		
CHEM375	Integrated Chemistry Laboratory I	1
CHEM376	Integrated Chemistry Laboratory II	1
300-Level Electives		**2**
Select two 300-level chemistry courses		
• electives must be 1.0 credit or greater and graded (A-F)		
• 2.0 accumulated credits of CHEM research may replace one elective		
• students who use CHEM144 for the Inorganic requirement must choose a third elective		
Colloquium		
CHEM521	Chemistry Colloquium	0.25
Senior Thesis (optional -- required for Departmental Honors)		
CHEM409	Senior Thesis Tutorial	1
CHEM410	Senior Thesis Tutorial	1

The **Biological Chemistry (B-track)** major requires the following coursework:

Code	Title	Hours
General Chemistry		
CHEM141	General Chemistry I	1
CHEM142	General Chemistry II	1
(may be fulfilled using CHEM145 and/or AP credit)		
Organic Chemistry		
CHEM251	Organic Chemistry I	1
CHEM252	Organic Chemistry II	1
Introductory Labs		
CHEM152	Introductory Chemistry Laboratory	0.5
CHEM257	Intermediate Chemistry Laboratory	0.5
CHEM258	Organic Chemistry Laboratory	0.5
Mathematics		
MATH121	Calculus I	1
MATH122	Calculus II	1
(may be fulfilled using AP credit or placement beyond MATH122)		
Biology		
BIOL181	Principles of Biology I: Cell Biology and Molecular Basis of Heredity	1
BIOL182	Principles of Biology II	1
Inorganic Chemistry		
CHEM361	Advanced Inorganic Chemistry	1
(waived for students who completed CHEM144)		
Physical Chemistry		
CHEM381	Physical Chemistry for the Life Sciences	1
Biochemistry		
MB&B208	Molecular Biology	1
CHEM383	Biochemistry	1
Advanced Labs (choose two)		

CHEM375	Integrated Chemistry Laboratory I	1
CHEM376	Integrated Chemistry Laboratory II	1
CHEM395	Structural Biology Laboratory	1
300-Level Electives		**1**
Select one 300-level chemistry courses		
• electives must be 1.0 credit or greater and graded (A-F)		
• 2.0 accumulated credits of CHEM research may replace one elective		
• students who use CHEM144 for the Inorganic requirement must choose a third elective		
Colloquium		
CHEM521	Chemistry Colloquium	0.25
Senior Thesis (optional -- required for Departmental Honors)		
CHEM409	Senior Thesis Tutorial	1
CHEM410	Senior Thesis Tutorial	1

COURSES FOR NON-MAJORS

Students with little or no prior background in chemistry are encouraged to enroll in General Chemistry I and II **(CHEM141/CHEM142)**, both of which fulfill NSM general education expectations and are appropriate for non-science majors. Students may also enroll in the Introductory Chemistry Laboratory (**CHEM152**) to supplement their coursework with hands-on experience.

Students with advanced preparation in chemistry are encouraged to enroll in Honors General Chemistry (**CHEM145**), a one-semester alternative to **CHEM141**/**CHEM142**. This course offers an enriched curriculum that explores the breadth of general chemistry topics in greater depth.

Students planning to apply to **medical, dental, or veterinary schools** are advised to complete the following prerequisite courses:

Code	Title	Hours
General Chemistry		
CHEM141	General Chemistry I	1
CHEM142	General Chemistry II	1
or		
CHEM145		
Organic Chemistry		
CHEM251	Organic Chemistry I	1
CHEM252	Organic Chemistry II	1
Laboratories		
CHEM152	Introductory Chemistry Laboratory	0.5
CHEM257	Intermediate Chemistry Laboratory	0.5
CHEM258	Organic Chemistry Laboratory	0.5

STUDENT LEARNING GOALS

Graduates with a BA in Chemistry should be able to:

- Apply the scientific method to develop and test hypotheses
- Understand, interpret, and apply chemical data
- Conduct standard laboratory procedures safely and effectively
- Use quantitative methods to solve chemical problems
- Locate and comprehend primary scientific literature
- Critically evaluate claims in chemical research
- Communicate findings clearly in written, oral, and visual forms
- Uphold ethical standards in scientific work
- Connect chemistry to other scientific disciplines

STUDY ABROAD

A semester abroad is possible with sufficient advance planning. Students are encouraged to consult with a chemistry faculty member early in the process to ensure appropriate course sequencing and progress toward the major.

ADVANCED PLACEMENT

Students who earn any of the following examination scores automatically receive 1.0 prematriculation credit in chemistry:

- AP Chemistry: score of 4 or 5
- IB-HL Chemistry: score of 5, 6, or 7
- Cambridge A-Level Chemistry: grade of A

This credit may be used in place of **CHEM141** , **CHEM142** , and **CHEM152** to satisfy requirements for majors, minors, and course prerequisites. Students awarded prematriculation credit are not eligible to receive credit for **CHEM141** or **CHEM142** , but may elect to enroll in **Honors General Chemistry (CHEM145)** for credit. Students who complete **CHEM145** may also take **Introductory Chemistry Laboratory (CHEM152)** for credit.

LANGUAGE REQUIREMENT

There is no language requirement for the chemistry major.

TRANSFER CREDIT

Transfer credit for chemistry courses taken at other institutions is subject to departmental approval and is not guaranteed. Requests are reviewed by the Chemistry Department Curriculum Committee and must be submitted in advance to confirm course eligibility prior to enrollment.

Submission Guidelines

Send all materials by email to **chemistry@wesleyan.edu before** enrolling in the course. Include the following:

- Completed *Permission to Transfer Credit* form (Office of Student Affairs)
- Detailed course syllabus, including schedule and topics covered
- Textbook title, author(s), edition, and chapters used
- Length of class meetings and total instructional hours (excluding exams)
- Instructor name and contact information

Additional Requirements

- Online lecture courses must have **synchronous** delivery. In-person courses are preferred.
- **Online laboratory courses will not be accepted**

ADDITIONAL INFORMATION

Undergraduate research. Research is an important part of the program for most majors. Wesleyan's small but excellent graduate program makes it possible for majors to work at the cutting edge of discovery in chemistry. Every tenured/tenure-track faculty member is involved in significant research. Undergraduates participating in the departmental research program normally attend a research seminar in their area, and most research groups have weekly meetings to discuss new results. Students involved in significant research have an opportunity to continue in the BA/MA program.

Seminars. Seminars are a vital part of the intellectual life of the Chemistry Department. Weekly departmental colloquia on Friday afternoons (CHEM521/CHEM522) bring accomplished scientists from other universities, research laboratories, and industry to campus and provide opportunities for informal meetings and discussions. In addition, chemistry students and faculty speak at weekly research seminars in chemical physics, organic/inorganic chemistry, and biochemistry. Programs for each semester are available on the chemistry website.

HONORS

Departmental honors are awarded by the faculty to graduating chemistry majors based on a thorough evaluation of the senior thesis, recognizing excellence in research, analysis, and scientific communication.

CAPSTONE EXPERIENCE

The recommended capstone experience for chemistry majors is a substantial research project conducted in collaboration with a faculty member, ideally culminating in a senior thesis. Research is a central component of the major for many students, and Wesleyan's small but distinguished graduate program provides unique opportunities for undergraduates to engage in advanced research alongside tenured and tenure-track faculty who are actively involved in significant investigations.