CHEMISTRY (BS)

Exploration and Discovery

Students majoring in the BS in Chemistry select either the General or Environmental Chemistry option. The BS in Chemistry (both options) follows guidelines established by the American Chemical Society. The program includes a required undergraduate research and/or internship experience for both options and prepares students for admission to graduate and professional schools, as well as employment as professional chemists.

Degree Requirements

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Course	Title	Credits
Major Requirements		
CH 2255	Techniques in Laboratory	3
CH 2335	General Chemistry I (QRCO)	4
CH 2340	General Chemistry II	4
CH 3030	Biochemistry I	4
CH 3370	Organic Chemistry I	4
CH 3380	Organic Chemistry II	4
CH 3410	Physical Chemistry: Thermodynamics and Kinetics (WRCO)	4
CH 3465	Physical Chemistry: Quantum Mechanics and Spectroscopy	4
CH 3500	Inorganic Chemistry	4
CH 3550	Instrumental Analysis (TECO,WRCO)	4
PH 2510	University Physics I	4
PH 2520	University Physics II	4
MA 2550	Calculus I (QRCO)	4
CH 4100	Senior Seminar	3
MA 2560	Calculus II (QRCO)	4
Choose one 3-4 credit course from the following list		3-4
CH 4531	Senior Research	
CH 3650	Environmental Chemistry	
CH 4600	Internship	
General Education (https://coursecatalog.plymouth.edu/general-education/)		
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
IS 4220	Signature Project (INCO,INCP)	4
Electives		8-23
CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI)	Creative Thought Direction	3-4
PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI)	Past and Present Direction	3-4
SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI)	Self and Society Direction	3-4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/) [1]		4-8
DICO (https://coursecatalog.plymouth.edu/general-education/#DICO)	Diversity Connection	3-4
GACO (https://coursecatalog.plymouth.edu/general-education/#GACO)	Global Awareness Connection	3-4
WECO (https://coursecatalog.plymouth.edu/general-education/#WECO)	Wellness Connection	3-4
Total Credits		**120**

[1] Directions should total 16-17 credits because SIDI is waived for BS Chemistry.

Recommended Course Sequence

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

To complete the bachelor's degree in 4 years, you must successfully complete a minimum of 15 credits each semester or have a plan to make up credits over the course of the 4 years. For example, if you take 14 credits one semester, you need to take 16 credits in another semester. Credits completed must count toward your program requirements (major, option, minor, certificate, general education or free electives).

Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

Course	Title	Credits
Year One		
EN 1400	Composition	4
IS 1115	Tackling a Wicked Problem	4
CH 2255	Techniques in Laboratory	3
CH 2335	General Chemistry I (QRCO)	4
CH 2340	General Chemistry II	4
MA 2550	Calculus I (QRCO)	4
MA 2560	Calculus II (QRCO)	4
CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI)	Creative Thought Direction	3-4
	Credits	**30-31**
Year Two		
CH 3370	Organic Chemistry I	4
CH 3380	Organic Chemistry II	4

PH 2510	University Physics I	4
PH 2520	University Physics II	4
PPDI (https://coursecatalog.plymou general-education/#PPDI)	Past and Present Direction	3-4
SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI)	Self and Society Direction	3-4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/) [1]		4-8
Elective		0-2
	Credits	**26-34**
Year Three		
CH 3030	Biochemistry I	4
DICO (https://coursecatalog.plymou general-education/#DICO)	Diversity Connection	3-4
GACO (https://coursecatalog.plymouth.edu/general-education/#GACO)	Global Awareness Cnnection	3-4
WECO (https://coursecatalog.plymou general-education/#WECO)	Wellness Connection	3-4
Electives		1-4
	Credits	**14-20**
Years Three and Four		
CH 3550	Instrumental Analysis (TECO,WRCO)	4
CH 3410	Physical Chemistry: Thermodynamics and Kinetics (WRCO)	4
CH 3465	Physical Chemistry: Quantum Mechanics and Spectroscopy	4
CH 3500	Inorganic Chemistry	4
	Credits	**16**
Year Four		
IS 4220	Signature Project (INCO,INCP)	4
CH 4100	Senior Seminar	3
Choose one of the following:		3-4
CH 4531 or CH 4600	Senior Research or Internship	
Electives		8-24
	Credits	**18-35**
	Total Credits	**120**

[1] Directions should total 16-17 credits because DI is waived for BS Chemistry.

Learning Outcomes

- Content Knowledge: Demonstrate mastery of a broad set of chemical knowledge concerning the fundamentals in the core areas of chemistry.
- Problem-Solving Skills: Design, carry out, and record the results of chemical analyses and experiments using classical techniques, modern instruments, and/or computers, then analyze those results to draw reasonable, accurate conclusions.
- Chemical Literature Skills: Employ modern library search tools to locate and retrieve scientific information about a chemical technique, or topic relating to chemistry.
- Laboratory Safety Skills: Observe safe practices in the laboratory, follow proper procedures and regulations for safe use and disposal of chemicals, and respond to emergencies in the laboratory.
- Communication Skills: Communicate chemical concepts and experimental results through effective written and oral communication.
- Team Skills: Work collaboratively with members of a team in classroom and/or laboratory activities.

Career Pathways

A chemistry degree from Plymouth State prepares students for a wide variety of career options in each profession. Plymouth State University focuses on several concentrations within the program:

Chemistry: Chemistry majors study the nature of all physical things, develop new products and processes, or monitor processes involved in making various products. Chemists typically work for private businesses, government agencies, or educational institutions.

For more information, visit Career Services in the Global Education Office.

Sample Job Titles:

- Air Quality Engineer
- Biochemist
- College Professor
- Environmental Consultant
- Health Care Administrator
- Instrumentation Specialist
- Microbiologist
- Pharmacologist
- Physicist
- Research Chemist
- Risk Manager
- Technical Writer

See the U.S. Department of Labor Outlook for a complete list.

Useful Skills for Jobs in the Chemistry and Biochemistry Fields:

- Ability to analyze cause and effects
- Proficiency in analytical reasoning
- Strong mathematical background
- Ability to organize and memorize detailed information
- Strong organization skills