CHEMISTRY MAJOR (B.A.)

https://ceps.unh.edu/chemistry/program/ba/chemistry-major

Description

The B.A. degree exposes students to the major fields of chemistry but provides more flexibility in course selection than the B.S. degree. The curriculum offers a comprehensive introduction to chemistry's traditional subdisciplines (analytical, inorganic, organic, and physical chemistry) via foundational classroom and laboratory experiences. Undergraduate research is an option, but not a requirement for this degree. The B.A. degree is directed towards students who have interdisciplinary interests and are not planning to either attend a traditional graduate program in chemistry or find immediate employment in the chemical industry. Instead, this degree is geared toward students who plan to attend graduate school in an interdisciplinary field where chemical knowledge will be beneficial, and students who are interested in chemistry but plan to pursue post-graduate degrees in the health sciences, education, business, or other pre-professional programs. With careful selection of elective courses, the B.A. degree may also lead to American Chemical Society certification.

Requirements

Degree Requirements

Minimum Credit Requirement: 128 credits

Minimum Residency Requirement: 32 credits must be taken at UNH

Minimum GPA: 2.0 required for conferral*

Core Curriculum Required: Discovery & Writing Program Requirements

Foreign Language Requirement: Yes

All Major, Option and Elective Requirements as indicated.
**Major GPA requirements as indicated.*

Major Requirements

Code	Title	Credits
CHEM 400	Freshman Seminar	1
CHEM 403	General Chemistry I	4
CHEM 404	General Chemistry II	4
CHEM 517 & CHEM 518	Introduction to Chemical Measurement Science and Practical Chemical Measurement Techniques and Instrumentation	5
CHEM 547 & CHEM 549	Organic Chemistry I and Organic Chemistry Laboratory	5
CHEM 548 & CHEM 550	Organic Chemistry II and Organic Chemistry Laboratory	5
CHEM 574 & CHEM 576	Chemistry Across the Periodic Table and Experimental Inorganic Chemistry	6
CHEM 683 & CHEM 685	Physical Chemistry I and Physical Chemistry Laboratory	5
CHEM 684 & CHEM 686	Physical Chemistry II and Physical Chemistry Laboratory	5
CHEM 762 & CHEM 763	Advanced Chemical Analysis Instrumentation and Advanced Chemical Instrumentation Laboratory	5
CHEM 798	Senior Seminar [1]	1
MATH 425	Calculus I	4
MATH 426	Calculus II	4
PHYS 407	General Physics I	4
or PHYS 401 & PHYS 402	Introduction to Physics I and Introduction to Physics II	
Total Credits		**58**

[1] CHEM 798 Senior Seminar satisfies the Discovery Capstone experience requirement. Students work with the instructor to prepare presentations based on a research project or chemistry-related professional engagement. This is a Writing Intensive course.

Degree Plan

Sample Degree Plan

This sample degree plan serves as a general guide; students collaborate with their academic advisor to develop a personalized degree plan to meet their academic goals and program requirements.

First Year		
Fall		**Credits**
CHEM 400	Freshman Seminar	1
CHEM 403	General Chemistry I	4
MATH 425	Calculus I	4
Discovery Course		4
Discovery Course		4
	Credits	**17**
Spring		
CHEM 404	General Chemistry II	4
MATH 426	Calculus II	4
ENGL 401	First-Year Writing	4
PHYS 407	General Physics I	4
	Credits	**16**
Second Year		
Fall		
CHEM 517	Introduction to Chemical Measurement Science	3
CHEM 518	Practical Chemical Measurement Techniques and Instrumentation	2
CHEM 547	Organic Chemistry I	3
CHEM 549	Organic Chemistry Laboratory	2
Language 1 (first semester of an elementary foreign language sequence)		4
The B.A. requires either 2 semesters of elementary foreign language or 1 semester of intermediate (or higher).		
Discovery Course		4
	Credits	**18**
Spring		
CHEM 548	Organic Chemistry II	3
CHEM 550	Organic Chemistry Laboratory	2
CHEM 574	Chemistry Across the Periodic Table	4
CHEM 576	Experimental Inorganic Chemistry	2
Language 2 (second semester of an elementary foreign language sequence)		4
	Credits	**15**

Third Year		
Fall		
CHEM 683	Physical Chemistry I	3
CHEM 685	Physical Chemistry Laboratory	2
Advanced Chemistry Elective - Advisor's Discretion. Can be CHEM 696, 708, 740, 755, 774, 776, 795 or 799.		3
Discovery Course		4
Discovery Course		4
	Credits	**16**
Spring		
CHEM 684	Physical Chemistry II	3
CHEM 685	Physical Chemistry Laboratory	2
CHEM 762	Advanced Chemical Analysis Instrumentation	3
CHEM 763	Advanced Chemical Instrumentation Laboratory	2
Discovery Course		4
	Credits	**14**
Fourth Year		
Fall		
Discovery Course		4
Elective Course		4
Elective Course		4
Elective Course		4
	Credits	**16**
Spring		
CHEM 798	Senior Seminar	1
Elective Course		4
Elective Course		4
Elective Course		4
Elective Course		4
	Credits	**17**
	Total Credits	**129**

Student Learning Outcomes

Program Learning Outcomes
At the time of graduation, a student should be able to:

- Reason with Chemistry's anchoring concepts: that matter consists of atoms that have internal structures that dictate their chemical and physical behavior; that atoms interact via electrostatic forces to form chemical bonds that chemical compounds have geometric structures that influence their chemical and physical behaviors; that intermolecular forces—electrostatic forces between molecules—dictate the physical behavior of matter; that matter changes, forming products that have new chemical and physical properties that energy is the key currency of chemical reactions in molecular scale systems as well as macroscopic systems; that chemical changes have a time scale over which they occur; that all chemical changes are, in principle, reversible, and chemical processes often reach a state of dynamic equilibrium; that Chemistry is generally advanced via experimental observations; and that Chemistry constructs meaning interchangeably at the particulate and macroscopic levels.
- Use Chemistry's cross-cutting concepts to interrogate and explain phenomena: chemical identity (how do we identify chemical substances?); structure-property relationships (how do we predict the properties of materials?); chemical causality (why do chemical processes occur?); chemical mechanism (how do chemical processes occur?); chemical control (how can we control chemical processes?); benefits-costs-risks (how do we evaluate the impacts of chemically transforming matter?)
- Demonstrate the following general scientific practices when displaying knowledge of chemical ideas and concepts: asking questions; developing and using models; constructing explanations; planning and carrying out investigations; engaging in argument from evidence; analyzing and interpreting data; using mathematics and computational thinking; obtaining, evaluating, and communicating information OR Demonstrate the following Chemistry core practices when displaying knowledge of chemical ideas and concepts (a) analysis: development and application of strategies for detecting, identifying, separating, and quantifying chemical substances (b)synthesis: the design of new substances and synthetic routes (c)transformation: controlling chemical processes for non-synthetic purposes.