

CHEMISTRY B.S./M.S.

Admission Requirements

B.S. applicants must complete the following admission requirements:

- Be admitted to the Chemistry baccalaureate program and have at least junior standing;
- Have a 3.0 GPA, and have completed 24 of their undergraduate major requirements;
- Submit a study goal statement;
- Submit a UAF graduate application for admission.

Program Requirements

< Back to Department (<https://catalog.uaf.edu/academic-departments/chemistry-biochemistry/>)

Minimum Requirements for Chemistry B.S./M.S. Degree: 138 credits *

* Some concentrations may require greater than 138 credits.

CONCENTRATIONS: CHEMISTRY (P. 1), BIOCHEMISTRY AND NEUROSCIENCE (P. 1), ENVIRONMENTAL CHEMISTRY (P. 2)

Students must earn a C- or better in all the below courses

Code	Title	Credits
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General University Requirements

Complete the general university requirements. (<https://catalog.uaf.edu/bachelors/#gurbachelorsdegreestext>)

General Education Requirements

Complete the general education requirements. 36-40
(<https://catalog.uaf.edu/bachelors/#generaleducationrequirementstext>)

As part of the general education requirements, complete the following:

MATH F251X	Calculus I	
PHYS F123X and PHYS F124X	College Physics I and College Physics II	
or PHYS F211X and PHYS F212X	General Physics I and General Physics II	

B.S. Degree Requirements

Complete the B.S. degree requirements. 16
(<https://catalog.uaf.edu/bachelors/#bachelorofsciencetext>)

As part of the B.S. requirements, complete the following:

MATH F252X	Calculus II	
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Chemistry Program Requirements ¹

Complete the following:

CHEM F105X and CHEM F105L	General Chemistry I and Chemistry F105X Lab	4
CHEM F106X and CHEM F106L	General Chemistry II and Chemistry F106X Lab	4
CHEM F202	Basic Inorganic Chemistry	3
CHEM F212	Chemical Equilibrium and Analysis	4

CHEM F321	Organic Chemistry I	4
CHEM F325	Organic Chemistry II	4
CHEM F331	Physical Chemistry I	4
CHEM F332	Physical Chemistry II	4
CHEM F434	Chemistry Capstone Laboratory	3
CHEM F449	General Biochemistry: Metabolism	3
CHEM F481	Seminar	1
CHEM F482	Seminar	2

As part of the ACS certification, complete:

MATH F253X	Calculus III	4
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Concentration

Complete one of the following: 9-24

Chemistry		
Biochemistry and Neuroscience		
Environmental Chemistry		

Total Credits 105-124

¹ Students must earn a C- or better.

Concentrations CHEMISTRY

Code	Title	Credits
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Chemistry Concentration Requirements

Complete one of the following: 3-5

CHEM F488	Undergraduate Chemistry and Biochemistry Research (3-4 credits)	
CHEM F288 and CHEM F488	Introduction to Chemical Research and Undergraduate Chemistry and Biochemistry Research (2-3 credits)	

Complete two of the following: 6

CHEM F314	Analytical Instrumental Laboratory	
CHEM F402	Inorganic Chemistry	
CHEM F450	Information Storage and Transfer: Molecules and Pathways	

Total Credits 9-11

BIOCHEMISTRY AND NEUROSCIENCE

Code	Title	Credits
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Biochemistry and Neuroscience Concentration Requirements

Complete the following:

BIOL F115X and BIOL F115L	Fundamentals of Biology I and BIOL F115X Laboratory	4
BIOL F116X and BIOL F116L	Fundamentals of Biology II and BIOL F116X Laboratory	4
CHEM F450	Information Storage and Transfer: Molecules and Pathways	3
CHEM F488	Undergraduate Chemistry and Biochemistry Research	3

Complete 10 credits from the following: ² 10

BIOL F240X	Beginnings in Microbiology	
BIOL F260 and F260L	Principles of Genetics and BIOL F260 Laboratory	

BIOL F310 and F310L	Animal Physiology and BIOL F310 Laboratory	
BIOL F342 and F342L	Microbiology and BIOL F342 Laboratory	
BIOL F402	Biomedical and Research Ethics	
BIOL F417	Neurobiology	
BIOL F462	Infectious Diseases	
CHEM F360	Cell and Molecular Biology	
CHEM F455	Environmental Toxicology	
CHEM F470	Cellular and Molecular Neuroscience	
CHEM F474	Neurochemistry	
Total Credits		24

² Courses selected under these areas must meet baccalaureate degree requirements for 39 upper-division credits.

ENVIRONMENTAL CHEMISTRY

Code	Title	Credits
Environmental Chemistry Concentration Requirements		
Complete the following:		
CHEM F314	Analytical Instrumental Laboratory	3
CHEM F488	Undergraduate Chemistry and Biochemistry Research	3
Complete two of the following:		6-8
ATM F401	Introduction to Atmospheric Sciences	
BIOL F240X	Beginnings in Microbiology	
BIOL F342	Microbiology	
BIOL F457	Environmental Microbiology	
GEOS F417	Introduction to Geochemistry	
NRM F380	Soils and the Environment	
Total Credits		12-14

M.S. portion of the Chemistry B.S./M.S. program with Thesis or Project Requirements

CONCENTRATIONS: BIOCHEMISTRY AND NEUROSCIENCE (P. 3), ENVIRONMENTAL CHEMISTRY (P. 3)

Code	Title	Credits
General University Requirements		
Complete the graduate general university requirements. (https://catalog.uaf.edu/masters/#gurmastersdegreestext)		
Master's Degree Requirements		
Complete the master's degree requirements. (https://catalog.uaf.edu/masters/#typesofmastersdegrees)		
As part of the master's degree requirements complete:		
Oral and Written Comprehensive Exam		
Chemistry Program Requirements		
Complete any deficiencies concurrently with this degree.		
Complete two credits of advisory committee-approved seminar courses from the two seminar course choices below.		2

³

CHEM F691	Research Presentation Techniques	
CHEM F688	Biochemical and Molecular Biology Seminar	
Complete 7-10 credits of courses approved by the advisory committee.		7-10
Concentration		
Complete 6-9 credits from relevant advisory-committee-approved graduate-level courses or select one of the following concentrations		6-9
Biochemistry and Neuroscience		
Environmental Chemistry		
Options		
Complete one of the following: ^{4,5}		12
Thesis Option		
Project Option		
Total Credits		27-33

³ Students in the Biochemistry and Neuroscience concentration should take the Biochemical and Molecular Biology Seminar and students in the Environmental Chemistry concentration should take Research Presentation Techniques.

⁴ The minimum number of credits required is 30. The required M.S. coursework above represents 18 credits. The minimum number of thesis credits required is 6. For the thesis option, the remaining 6 credits can either be thesis credits or courses at the F400 level or higher. For the project option, the remaining 6 credits can be courses at the F400 level or higher.

⁵ No more than 12 thesis credits (CHEM F699) and no more than 6 project credits (CHEM F698).

Options

THESIS OPTION

Code	Title	Credits
Complete the following:		
CHEM F699	Thesis	6
Thesis credits or committee-approved courses that are F400-level or higher. ^{4,6}		6
Submit a committee-approved, written research-based thesis proposal and pass an oral comprehensive examination centered on the proposal.		
Complete a committee-approved, research-based written thesis and pass an oral defense of the thesis.		
Total Credits		12

⁴ The minimum number of credits required is 30. The required M.S. coursework above represents 18 credits. The minimum number of thesis credits required is 6. For the thesis option, the remaining 6 credits can either be thesis credits or courses at the F400 level or higher. For the project option, the remaining 6 credits can be courses at the F400 level or higher.

⁶ Six (6) F400-level credits earned during the B.S. portion of the program count toward the M.S.

PROJECT OPTION

Code	Title	Credits
Complete the following:		
CHEM F698	Non-thesis Research/Project	6
Committee-approved courses that are F400-level or higher. ^{4,6}		6
Submit a committee-approved, literature-based written project proposal and pass an oral comprehensive examination centered on the proposal.		
Complete a committee-approved, literature-based written project and pass an oral defense of the project.		
Total Credits		12

⁴ The minimum number of credits required is 30. The required M.S. coursework above represents 18 credits. The minimum number of thesis credits required is 6. For the thesis option, the remaining 6 credits can either be thesis credits or courses at the F400 level or higher. For the project option, the remaining 6 credits can be courses at the F400 level or higher.

⁶ Six (6) 400-level credits earned during the B.S. portion of the program count toward the M.S.

Concentrations

BIOCHEMISTRY AND NEUROSCIENCE

Code	Title	Credits
Biochemistry and Neuroscience Concentration Requirements		
Complete 9 credits from the following:		9
CHEM F654	Protein Structure and Function	
CHEM F657	Molecular Foundations of Gene Expression	
CHEM F670	Cellular and Molecular Neuroscience	
CHEM F674	Membrane Biochemistry and Biophysics	
CHEM F675	Cellular Signaling	
Total Credits		9

ENVIRONMENTAL CHEMISTRY

Code	Title	Credits
Environmental Chemistry Concentration Requirements		
Complete 6 credits from the following:		6
CHEM F606	Atmospheric Chemistry	
CHEM F609	Aqueous and Environmental Geochemistry	
CHEM F631	Environmental Fate and Transport	
CHEM F655	Environmental Toxicology	
Total Credits		6