MAJOR IN CHEMISTRY, ENVIRONMENTAL CHEMISTRY CONCENTRATION

Requirements
Effective Spring 2024

Chemistry majors must achieve a minimum grade of C (2.000) in all the listed courses required for the major in chemistry.

Freshman

		AUCC	Credits
CHEM 120[1]	Foundations of Modern Chemistry (GT-SC2)	3A	4
CHEM 121[1]	Foundations of Modern Chemistry Laboratory (GT-SC1)	3A	1
CHEM 192	Introductory Seminar in Chemistry		2
CHEM 241[2]	Foundations of Organic Chemistry		4
CHEM 242[2]	Foundations of Organic Chemistry Laboratory		1
CHEM 263	Foundations of Inorganic Chemistry		4
CHEM 264	Foundations of Inorganic Chemistry Laboratory		1
CO 150	College Composition (GT-CO2)	1A	3
Select one course from the following:			4
MATH 155	Calculus for Biological Scientists I (GT-MA1)	1B	
MATH 160	Calculus for Physical Scientists I (GT-MA1)	1B	
Arts and Humanities (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-and-humanities)		3B	3
Diversity, Equity, and Inclusion (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-equity-inclusion)		1C	3
	Total Credits		**30**

Sophomore

CHEM 231	Foundations of Analytical Chemistry		3
CHEM 232	Foundations of Analytical Chemistry Lab		2
CHEM 321 or BC 351	Foundations of Chemical Biology Principles of Biochemistry		4
CHEM 322	Foundations of Chemical Biology Laboratory		1
PH 121 or 141	General Physics I (GT-SC1) Physics for Scientists and Engineers I (GT-SC1)	3A	5
PH 122 or 142	General Physics II (GT-SC1) Physics for Scientists and Engineers II (GT-SC1)	3A	5
Select one group from the following:			8
Group A			
MATH 271	Applied Mathematics for Chemists I		
MATH 272	Applied Mathematics for Chemists II		
Group B			
MATH 161	Calculus for Physical Scientists II (GT-MA1)	1B	
MATH 261	Calculus for Physical Scientists III		
	Total Credits		**28**

Junior

CHEM 338	Environmental Chemistry	4B	3

CHEM 371	Fundamentals of Physical Chemistry		4
CHEM 372	Fundamentals of Physical Chemistry Lab	4A	1
GES 141	Introduction to Sustainable Energy		3
Select one course from the following:			3
STAT 301	Introduction to Applied Statistical Methods		
STAT 307	Introduction to Biostatistics		
Advanced Writing (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#advanced-writing)[3]		2	3
Arts and Humanitites (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-and-humanities)		3B	3
Historical Perspectives (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)		3D	3
Social and Behavioral Sciences (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences)		3C	3
Electives			6
	Total Credits		**32**

Senior

CHEM 431	Instrumental Analysis	4B	4
Select one course from the following:			2
CHEM 493	Senior Seminar	4C	
CHEM 499[4]	Senior Thesis	4C	
Select three credits from the following courses:			3
ERHS 320	Environmental Health--Water Quality		
ERHS 446	Environmental Toxicology		
ERHS 448	Environmental Contaminants		
GES 465/MSE 465	Sustainable Strategies for E-Waste Management		
GES 542	Biobased Fuels, Energy, and Chemicals		
SOCR 467	Soil and Environmental Chemistry		
Advanced Electives (see list below)			9
In-depth Chemistry Courses (see list below)			5
Electives[5]			7
	Total Credits		**30**
	Program Total Credits:		**120**

In-depth Chemistry Courses

At least 3 credits must come from laboratory course or lab components of lecture/laboratory courses: CHEM 431, CHEM 433, CHEM 440, CHEM 462, CHEM 477, or CHEM 498.

Code	Title	AUCC	Credits
CHEM 311	Introduction to Nanoscale Science		3
CHEM 315	Foundations of Polymer Chemistry		3
CHEM 320	Chemistry of Addictions		3
CHEM 333	Forensic Chemistry		3
CHEM 433	Clinical Chemistry		3
CHEM 440	Advanced Organic Chemistry Laboratory	4B	2
CHEM 445	Synthetic Organic Chemistry	4B	3
CHEM 448	Medicinal Chemistry		3
CHEM 461	Inorganic Chemistry	4B	3
CHEM 462	Inorganic Chemistry Laboratory	4B	2
CHEM 476	Physical Chemistry II	4B	3

CHEM 477	Advanced Physical Chemistry Laboratory	4B	1
CHEM 498	Research		1-3

Advanced Electives

Code	Title	Credits
ATS 350	Introduction to Weather and Climate	2
ATS 351	Introduction to Weather and Climate Lab	1
ERHS 320	Environmental Health--Water Quality	3
ERHS 332	Principles of Epidemiology	3
ERHS 400	Radiation Safety	3
ERHS 410	Environmental Health-Air and Waste Management	3
ERHS 430	Human Disease and the Environment	3
ERHS 446	Environmental Toxicology	3
ERHS 448	Environmental Contaminants	3
ERHS 450	Introduction to Radiation Biology	3
GES 441	Analysis of Sustainable Energy Solutions	3
Upper-Division regular courses (300-379; 400-479) from the following subject codes:		
AA		
AB		
ANEQ		
BC		
BIOM		
BMS		
BSPM		
BZ		
CBE		
CHEM		
CS		
CT		
ESS		
FTEC		
FW		
HES		
HORT		
LIFE		
MATH		
MIP		
NR		
NSCI		
PH		
PSY		
SOCR		
STAT		

1 Students who complete General Chemistry in Freshman year (CHEM 111 or CHEM 107, CHEM 112 or CHEM 108, CHEM 113, CHEM 114) do not have to take CHEM 120 and CHEM 121.

2 Students may complete the organic chemistry requirement by taking CHEM 341, CHEM 343, and CHEM 344. Students who take CHEM 245/CHEM 246 may complete the organic chemistry requirement by taking CHEM 343/CHEM 344. For both sets of these students, CHEM 343/CHEM 344 together count as an in-depth chemistry course.

3 CHEM 301 is recommended.

4 CHEM 499 by department approval. Students fulfilling the AUCC 4C requirement with CHEM 499 must write a thesis and present it to the department.

5 Select enough elective credits to bring the program total to a minimum of 120 credits, of which at least 42 must be upper-division (300- to 400-level).