

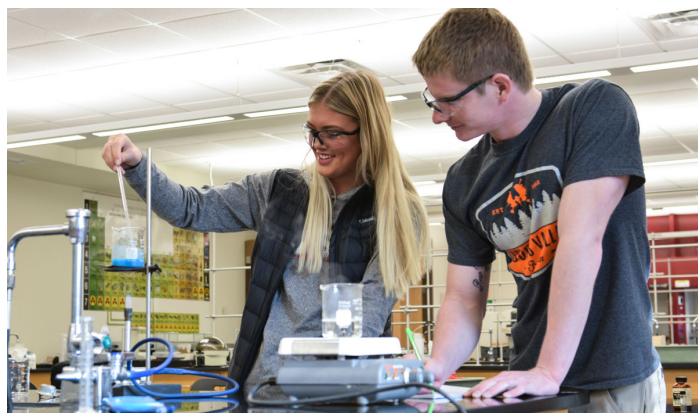


Chemistry

About this Major

VCSU's Chemistry degree is designed for those interested in working as laboratory scientists or pursuing research or graduate studies. The program is thorough and rigorous, and a wide variety of career possibilities in research areas are possible. There are two well-equipped research labs and students are encouraged to be involved in research.

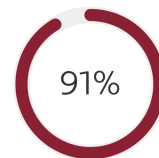
Meet a Student



Jobs with a Chemistry Degree

4,856 jobs

openings in this career field last year in the upper Midwest



of jobs posted in this career field in the upper Midwest require a Bachelor's degree

\$61,200 annually

median salary for the chemistry career field in the upper Midwest region

VCSU is where I found my place, my role and myself. I'm sure every student here can say the same, that their passions for what they love and are interested in has been supported while attending VCSU. I transferred to VCSU my sophomore year. I remember visiting the chemistry lab on campus and thinking "you're telling me I can be in here working with these things?" Not only have I had many opportunities to learn from amazing professors, but I have also been able to teach and tutor chemistry, physics and STEM students. - Lindsey Kiecker, Jamestown, N.D.,

Get Involved in your Major

Pre-Professional Club You are invited to join the VCSU Pre-Professional Club. This club is for students interested in continuing their education in the medical field (including nursing), law, accounting, and graduate school. This club provides support for students going through the application process and provides opportunities to practice aptitude tests such as the GRE, mCAT, LSAT, and DAT. Volunteer work, job shadowing, and educational and leadership opportunities are also part of the club's activities. The goal is for students to support each other, learn from other students' experiences, thus making your applications stronger, and increase your chance for successful admission into your program of choice.

Career opportunities may include:

- Biochemist
- Chemist
- Crime Lab Analyst
- Environmental Health Specialist
- Food Scientist/Technologist
- Forensic Chemist
- Industrial Hygienist
- Medical Technologist
- Optometrist
- Patent Agent
- Pharmaceutical Sales Representative
- Pharmacist
- Physician
- Quality Control Manager
- Science Laboratory Technician
- Soil Scientist
- Technical Writer
- Toxicologist



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- Veterinarian
- Water/Wastewater Plant Manager

Practical Experience

Opportunities that are not part of any regular program exist on and off campus to provide sound practical experience, such as student assistants, participation in the campus-tutoring programs, and field studies. Internships at numerous facilities are available to students to develop and apply their skills. Students can do (and have done) internships at Dakota Gasification Company in Beulah, N.D.; American Crystal Sugar in Hillsboro, N.D.; and Minnesota Valley Testing Laboratories in Bismarck, N.D. They also have completed summer REUs (Research Experience for Undergrads) at NDSU and UND.

Contact Information

Department Chair

Dr. Nicholas Galt, nicholas.galt@vcsu.edu, (701) 845-7459

Faculty Contact

Dr. Teather Sundstrom, teather.sundstrom@vcsu.edu, (701) 845-7458

Department Location

Rhoades Science Center 203

Schedule your visit today!

<http://visit.vcsu.edu/> (701) 845-7101 or (800) 532-8641

General Education Requirements

Code	Title	Credits
English Composition		
Select one of the following:		6
ENGL 110	College Composition I	
ENGL 120	College Composition II	
	or ENGL 12!Introduction to Professional Writing	
or		
ENGL 120	College Composition II	
	or ENGL 12!Introduction to Professional Writing	
ENGL 210	College Composition III: Persuasive Writing	
Speech Communication		
Select one of the following:		3
COMM 110	Fundamentals of Public Speaking	
COMM 212	Interpersonal Communication	
COMM 216	Intercultural Communication	
Mathematics		
Select one of the following:		3
MATH 103	College Algebra	
MATH 104	Finite Mathematics	
MATH 107	Precalculus	
MATH 110	Mathematics in Society	
MATH 165	Calculus I ¹	
MATH 210	Elementary Statistics	
Lab Science		

Select two of the following, one must come from the Natural and Physical Sciences category 8

Natural and Physical Sciences (ND:LABSC)

BIOL 111	Concepts of Biology
BIOL 150	General Biology I
BIOL 151	General Biology II
BIOL 170	General Zoology
CHEM 115	Introductory Chemistry
CHEM 116	Introduction to Organic and Biochemistry
CHEM 121	General Chemistry I
CHEM 122	General Chemistry II
GEOLOGY 100	Introduction to Earth Science
GEOLOGY 106	The Earth Through Time
PHYS 100	Concepts of Physics
PHYS 110	Introductory Astronomy
PHYS 211	College Physics I ²
PHYS 212	College Physics II ²
PHYS 251	University Physics I ²
PHYS 252	University Physics II ²

Additional Sciences (ND:SCI)

PSYC 240	Cognition and Brain Science
TECH 161	Technology, Engineering, and Design
TECH 165	Technology Solutions for Society

Wellness

Select one of the following: 2

HPER 100	Concepts of Fitness and Wellness
HPER 212	Introduction to Stress Management

Computer Science and Literacy

Select one of the following: 3

CIS 147	Principles of Information Security
CIS 170	Introduction to Computer Information Systems ³
CSCI 120	Introduction to Programming
CSCI 127	Introduction to Programming in Java
CSCI 160	Introduction to Structured Programming I
CSCI 289	Social Implications of Computer Technology ³
SE 110	Discovering Computing

Digital Literacy

Select one of the following:

CIS 170	Introduction to Computer Information Systems ³
CSCI 289	Social Implications of Computer Technology ³

Humanities

Literacies

Select one of the following: 3

ASL 101	American Sign Language I
ASL 102	American Sign Language II
COMM 211	Oral Interpretation
ENGL 220	Introduction to Literature
ENGL 225	Introduction to Film
ENGL 231	Bible as Literature
ENGL 232	Mythology
ENGL 236	Women and Literature
ENGL 241	World Literature I
ENGL 242	World Literature II
ENGL 261	American Literature I
ENGL 262	American Literature II
HUM 201	Civilization, Thought, and Literary Heritage
PSYC 200	Ethics and Philosophy of Science
SPAN 101	1st Year Spanish I



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SPAN 102	1st Year Spanish II
SPAN 201	2nd Year Spanish I
SPAN 202	2nd Year Spanish II
THEA 110	Introduction to Theatre Arts

Art and Music

Select one of the following: 3

ART 110	Introduction to the Visual Arts
ART 115	Introduction to Digital Media
ART 210	Art History I
ART 211	Art History II
ART 233	History of Craft
HUM 202	Fine Arts and Aesthetics
MUS 100	Music Appreciation
MUS 101	Music Fundamentals
MUS 201	World Music
MUS 207	History of Popular/Rock Music

Social Science

Select 6 credits from the following: 6

ANTH 111	Introduction to Anthropology
COMM 112	Understanding Media and Social Change
COMM 114	Human Communication
ECON 201	Principles of Microeconomics
ECON 202	Principles of Macroeconomics
GEOG 151	Human Geography
HIST 103	United States to 1877
HIST 104	United States to Present
HIST 211	World Civilizations to 1500
HIST 212	World Civilizations since 1500
HIST 267	Environmental History
HIST 270	Native American Studies
POLS 115	American National Government
POLS 116	State and Local Government
PSYC 111	Introduction to Psychology
SOC 110	Introduction to Sociology
SOC 111	Introduction to Anthropology

Additional Humanities or Social Science

Select one additional course from Humanities or Social Science 2
or select from the following:

ART 122	Two-Dimensional Design
ART 130	Drawing I
ART 150	Ceramics I
ART 180	Photography I
ART 182	Art With a Smartphone
GEOG 111	Survey of Geography
MUS 104	Group Piano for Non-Majors
MUS 105	Group Piano for Non-Majors
MUS 130	Valkyries
MUS 131	Concert Choir
MUS 140	Athletic Band
MUS 141	Concert Band
PHYS 275	Planetarium Science
THEA 201	Theatre Practicum

Total Credits 39

¹ Required

² Required to take PHYS 211 College Physics I and PHYS 212 College Physics II or take PHYS 251 University Physics I and PHYS 252 University Physics II

³ CIS 170 and CSCI 289 may be used to satisfy both the Computer Science and Literacy and the Digital Literacy requirement for Gen Ed.

Major Requirements

Code	Title	Credits
Required Courses		
CHEM 121	General Chemistry I	5
CHEM 122	General Chemistry II	5
CHEM 330	Quantitative Analysis I	4
CHEM 341	Organic Chemistry I	5
CHEM 342	Organic Chemistry II	5
CHEM 411	Physical Chemistry I	4
CHEM 425	Inorganic Chemistry	4
CHEM 491	Integrated Science Capstone	2
Directed Electives		
Select eight hours from the following:		8
CHEM 331	Quantitative Analysis II	
CHEM 360	Elements of Biochemistry	
CHEM 395	Laboratory Preparation and Management	
CHEM 412	Physical Chemistry II	
CHEM 194	Independent Study	
CHEM 294	Independent Study	
CHEM 394	Independent Study	
CHEM 494	Undergraduate Research	
BA Language/Cultural Studies or BS Related Field		
Total Credits		42

Total General Education 39-41 Hrs

Total Major Requirement 42 Hrs

Total Credits Needed to Graduate 120 Hrs

Note: This major requires a minor

For degree and graduation requirements, visit degree requirements and graduation requirements (<http://catalog.vcsu.edu/undergraduate-catalog/academic-affairs/degree-requirements/>).



Plan of Study

Fall start - even years

First Year

Fall	Credits	Spring	Credits
Art and Music (Gen Ed)	3	CHEM 122	5
CHEM 121	5	COMM 110 (Gen Ed)	3
CIS 170 (Gen Ed)	3	ENGL 120 (Gen Ed)	3
ENGL 110 (Gen Ed)	3	HPER 100 (Gen Ed)	2
UNIV 150	1	Social Science (Gen Ed)	3
15		16	

Second Year

Fall	Credits	Spring	Credits
Additional Humanities or Social Science (Gen Ed)	2	CHEM 331	4
CHEM 330	4	MATH 165 (Gen Ed)	4
Literacies (Gen Ed)	3	Minor course	3
PHYS 211 (Gen Ed)	4	PHYS 212 (Gen Ed)	4
13		15	

Third Year

Fall	Credits	Spring	Credits
CHEM 341	5	CHEM 342	5
CHEM 411	4	CHEM 425	4
Minor course	3	Minor course	3
Minor course	3	Social Science (Gen Ed)	3
15		15	

Fourth Year

Fall	Credits	Spring	Credits
CHEM 360	4	Elective	4
CHEM 491	2	Elective	3
Elective	3	Elective	3
Minor course	3	Minor course	3
Minor course	3	Minor course	3
15		16	

Total Credits 120

Fall start - odd years

First Year

Fall	Credits	Spring	Credits
Art and Music (Gen Ed)	3	CHEM 122 (Gen Ed)	5
CHEM 121 (Gen Ed)	5	COMM 110 (Gen Ed)	3
CIS 170 (Gen Ed)	3	ENGL 120 (Gen Ed)	3
ENGL 110 (Gen Ed)	3	HPER 100 (Gen Ed)	2
UNIV 150	1	Social Science (Gen Ed)	3
15		16	

Second Year

Fall	Credits	Spring	Credits
Additional Humanities or Social Science (Gen Ed)	2	CHEM 342	5
CHEM 341	5	Minor Course	3
Literacies (Gen Ed)	3	PHYS 212	4
PHYS 211	4	Social Science (Gen Ed)	3
14		15	

Third Year

Fall	Credits	Spring	Credits
CHEM 330	4	CHEM 331	4
CHEM 360	4	MATH 165 (Gen Ed)	4
Minor Course	3	Minor Course	3
Minor Course	3	Minor Course	3
14		14	

Fourth Year

Fall	Credits	Spring	Credits
CHEM 411	4	CHEM 425	4
CHEM 491	2	Elective	3
Elective	3	Elective	3
Minor Course	4	Elective	3
Minor Course	3	Minor Course	3
16		16	

Total Credits 120

Please note: This plan is intended for general information only. Students are strongly encouraged to meet with their academic advisor each semester before registration.

Learning Outcomes

1. Demonstrate a fundamental knowledge of the major concepts in chemistry.
2. Exhibit critical thinking skills by applying the scientific method to solve problems.
3. Exhibit the ability to read and communicate in a scientific style.
4. Exhibit the ability to collaborate
5. Understand the importance of chemistry to themselves and society.