

CHEMISTRY B.S. WITH AN EDUCATION MINOR (VISTA)

Requirements

Students seeking the Bachelor of Science degree in Chemistry Teacher Education with a minor in Education must complete the Lower and Upper Division major core requirements and the following courses. This program is associated with the Integrated Teacher Education Program (ITEP/VISTA).

Code	Title	Units
	Core Curriculum Requirements (https://catalog.vanguard.edu/college/core-curriculum/)	54-52
	Major Core Requirements	66-65
	Integrated Teacher Education Program Requirements (p. 1)	27
Total Units		147-144

Chemistry Major Core Requirements

Code	Title	Units
Lower Division Chemistry Core Courses		
CHEM-120 & 120L	General Chemistry I and General Chemistry I Lab ¹	4
CHEM-121 & 121L	General Chemistry II and General Chemistry II Lab	4
CHEM-252 & 252L	Analytical Chemistry and Analytical Chem Techniques	4
MATH-180C	Calculus I	4
MATH-181C	Calculus II	4
PSCI-223C & 223CL	Mechanics of Solids and Fluids and Mechanics of Solids and Fluids Lab	4
PSCI-225 & 225L	Electricity and Magnetism and Electricity and Magnetism Lab	4
Upper Division Chemistry Core Courses		
CHEM-304 & 304L	Organic Chemistry I and Organic Chemistry Techniques I	4
CHEM-305 & 305L	Organic Chemistry II and Organic Chemistry Technqs II	4
CHEM-430 & 430L	Biochemistry and Experimental Tech/Biochemistry	4
CHEM-440 & 440L	Instrumental Analysis and Instrumental Analysis Lab	4
CHEM-456 & 456L	Physical Chemistry: Thermodynamics and Physical Chemistry Technique Lab	4
CHEM-457	Physical Chemistry: Kinetics	2
CHEM-458	Physical Chemistry: Quantum Mechanics	2
CHEM-485	Undergraduate Research	2
CHEM-499C	Chemistry Capstone Seminar	2
Upper Division Chemistry Electives		
Select one course from the following:		3
CHEM-435	Advanced Biochemistry	

CHEM-470	Special Topic:	
And select two courses from the following:		6-7
MATH-207	Computer Programming	
MATH-281	Multivariable Calculus	
MATH-300	Linear Algebra	
MATH-310	Differential Equations	
MATH-365	Probability and Statistics	
MATH-390	Numerical Analysis	
PSCI-227	Waves, Optics and Modern Physics	
Total Units		65-66

¹ See CHEM-120 General Chemistry I course description for prerequisites.

Integrated Teacher Education Program Requirements

Code	Title	Units
Credentialing Coursework		
First Semester:		
EDUC-424	Foundations in Teaching for Single Subject	2
EDUC-426	Instructional Design and Subject Specific Pedagogy for Single Subject	4
EDUC-435	Supervised Fieldwork for Single Subject	4
EDUC-442	CalTPA Cycle 1	0.5
EDUC-444	Language Acquisition for Secondary Students	1
EDUC-447	Metacognition/Reading Strategies for Secondary Students	1
EDUC-452	Literacy in Content Areas for Secondary Students	1
EDUC-464	Use of Technology in the Classroom	1
Second Semester:		
EDUC-434	Curriculum Unit Planning for Single Subject	2
EDUC-443	CalTPA Cycle 2	0.5
EDUC-488	Clinical Practice Seminar for Single Subject	2
EDUC-489	Clinical Practice Fieldwork for Single Subject	8
Total Units		27

Four Year Plan

Disclaimer: This sample Four Year Plan is provided as a guide for the recommended sequencing of courses. Vanguard University requires that students complete a minimum of 120 units of required course work as outlined on the Requirements tab in order to receive a Bachelor of Arts, Bachelor of Music, Bachelor of Science, or Bachelor of Science in Nursing degree. It is the student's responsibility to confirm with the department the course rotation before enrolling in courses. If applicable, please note the footnotes at the bottom of the page for additional information related to courses listed in a particular year and term. Questions, contact the Department of Chemical and Environmental Sciences.

Study Abroad Participation: Students interested in participating in the university's Study Abroad programs are encouraged to reach out to the Global Education and Outreach Office (studyabroad@vanguard.edu) for more information and collaboration



in their academic course planning. Students using Education and Training Benefits through the U.S. Department of Veteran Affairs are encouraged to also reach out to the School Certifying Official (veteranscertifyingofficial@vanguard.edu) for more information regarding how benefits can be applied.

Course	Title	Units
Year 1 Term 1		
CORE-100C	Cornerstone	1
CHEM-120	General Chemistry I	3
CHEM-120L	General Chemistry I Lab	1
MATH-180C	Calculus 1	4
ENGL-120C	Persuasive Writing	3
NT-101C	New Testament Survey	3
KINE-146C	Lifetime Fitness/Well Activity	1
Units		16
Year 1 Term 2		
CHEM-121	General Chemistry II	3
CHEM-121L	General Chemistry II Lab	1
MATH-181C	Calculus II	4
FINA-PLCR	Fine Arts Core Curriculum Requirement	3
THEO-101C	Foundations of Christian Life	3
KINE-145C	Lifetime Fitness/Wellness Lect	1
HIST-PLCR2	History Core Requirement (World Civ)	3
Units		18
Year 2 Term 1		
PSCI-PLGP1	Physics 1 Requirement	4
CHEM-456	Physical Chemistry: Thermodynamics	2
EDUC-315	Teaching in a Multicultural Setting	3
CHEM-304	Organic Chemistry I	3
CHEM-304L	Organic Chemistry Techniques I	1
ANTH-102C	Intro to Cultural Anthropology	3
Units		16
Year 2 Term 2		
PSCI-PLGP2	Physics 2 Requirement	4
CHEM-305	Organic Chemistry II	3
CHEM-305L	Organic Chemistry Technqs II	1
ENGL-220C	Researched Writing	3
OT-201C	Old Testament Survey	3
CHEM-456L	Physical Chemistry Technique Lab	1-2
Units		15-16
Year 3 Term 1		
CHEM-252	Analytical Chemistry	3
CHEM-252L	Analytical Chem Techniques	1
CHEM-430	Biochemistry	3
CHEM-430L	Experimental Tech/Biochemistry	1
COMM-201C	Speech Composition and Presentation	3
THEO-300C	Developing a Christian World View	3

SOC-PLCR	Social Science Core Curriculum Reqmt	3
Units		17
Year 3 Term 2		
CHEM-PLUD4A	Upper Division STEM Elective (4 units)	4
ENGL-230C	Literature and the Human Experience	3
ANTH-453	Language,Culture/Linguistics	3
CHIS-400C	Christian Heritage	3
CHEM-485	Undergraduate Research	1-4
POLS-155C	American Democracy	3
Units		17-20
Year 4 Term 1		
EDUC-424	Foundations in Teaching for Single Subject	2
EDUC-426	Instructional Design and Subject Specific Pedagogy for Single Subject	4
EDUC-435	Supervised Fieldwork for Single Subject	4
EDUC-444	Language Acquisition for Secondary Students	1
EDUC-447	Metacognition/Reading Strategies for Secondary Students	1
EDUC-452	Literacy in Content Areas for Secondary Students	1
EDUC-464	Use of Technology in the Classroom	1
EDUC-442	CalTPA Cycle 1	0.5
Units		14.5
Year 4 Term 2		
CHEM-499C	Chemistry Capstone Seminar	2
EDUC-434	Curriculum Unit Planning for Single Subject	2
EDUC-488	Clinical Practice Seminar for Single Subject	2
EDUC-489	Clinical Practice Fieldwork for Single Subject	8
EDUC-443	CalTPA Cycle 2	0.5
Units		14.5
Total Units		128-132

