

CHEMISTRY (SECONDARY EDUCATION) - BACHELOR OF ARTS

The Bachelor of Arts curriculum is designed to provide flexibility with less depth in chemistry, physics, and mathematics. The Secondary Education concentration curriculum prepares high-quality teachers for public schools and leads to a Minor in Secondary Education which leads to the New Mexico—Initial Teaching License, Secondary General Science Education (Grades 6-12). Students may receive both a Bachelor of Science in Biochemistry degree and a Bachelor of Arts in Chemistry (Secondary Education) degree. All departmental and nondepartmental requirements must earn a C- or better final grade or an S if the course is designated for S/U grading.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
	English Composition - Level 1 ¹	
	English Composition - Level 2 ¹	
	Oral Communication ¹	
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
	or MATH 1511H Calculus and Analytic Geometry I Honors	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ³	
	or CHEM 1216 General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors ³	
	or CHEM 1226 General Chemistry II Lecture and Laboratory for CHEM Majors	
Area IV: Social/Behavioral Sciences Course (3 credits) ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II	4
	or MATH 1521H Calculus and Analytic Geometry II Honors	
Viewing A Wider World ⁴		3
Departmental/College Requirements		
CHEM 2111	Explorations in Chemistry and Biochemistry	1
	or BCHE 140 Explorations in Chemistry and Biochemistry	
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
CHEM 371	Analytical Chemistry	4

CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
CHEM 443	Senior Seminar	1
Select one from the following:		3
CHEM 456	Inorganic Structure and Bonding	
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory	
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	
Additional Upper Division Chemistry credits ⁵		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Select one from the following:		4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics ⁶	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Select one from the following:		4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory ^{7,8}	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
<i>Secondary Education Requirements</i>		
EDUC 3120	Multicultural Education	3
EDUC 3997	Secondary Field Experience	3
EDUC 4410	Teaching Science at the Middle and High School Level ⁹	3
EDUC 4820	Secondary Student Teaching ¹⁰	9
EDUC 4821	Middle and High School Student Teaching Seminar ¹⁰	3
READ 4330	Content Area Literacy ⁹	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120		
Select sufficient electives to bring total credits to 120, including 48 upper-division. ¹¹		24
Total Credits		120

¹ See the General Education (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/>) section of the catalog for a full list of courses

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

³ CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors is intended for students that completed high school Chemistry. Students with no prior Chemistry or those desiring a refresher are strongly encouraged to take CHEM 1111 prior to CHEM 1215G enrollment. CHEM 1111 is an acceptable pre-requisite for CHEM 1215G.

CHEM 1216 General Chemistry I Lecture and Laboratory for CHEM Majors and CHEM 1226 General Chemistry II Lecture and Laboratory for CHEM Majors are recommended and are acceptable General Education substitutions for CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors and CHEM 1225G General Chemistry II Lecture and Laboratory for STEM Majors but will need a degree audit exception that can be coordinated with your advisor.

- ⁴ See the Viewing a Wider World (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext>) section of the catalog for a full list of courses. VWW 3-credit Upper-division rule can be met with Secondary Education Minor.
- ⁵ The additional chemistry course can be one 3-credit CHEM course or three 1-credit CHEM courses. BCHE 395 Biochemistry I or BCHE 395H Biochemistry I Honors can also be used to fulfill the additional chemistry course requirement.
- ⁶ PHYS 2110 Mechanics is the Physics I course recommended for all Chemistry majors. PHYS 1230G Algebra-Based Physics I, PHYS 2230G General Physics for Life Science I, and PHYS 1310G Calculus-Based Physics I are acceptable and are recommended in the decreasing order listed.
- ⁷ PHYS 2140 Electricity and Magnetism is the Physics II course recommended for all Chemistry majors. PHYS 1240G Algebra-Based Physics II, PHYS 2240G General Physics for Life Science II, and PHYS 1240G Algebra-Based Physics II are acceptable and are recommended in the decreasing order listed. Students are highly cautioned to check prerequisites for the individual courses when schedule planning.
- ⁸ Students are strongly encouraged to check prerequisite/corequisite requirements for Physics labs when schedule planning.
- ⁹ Requires Teacher Education Program (TEP) admittance
- ¹⁰ Requires application for Student Teaching Entrance (STEP)
- ¹¹ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor. Since the degree leads to a General Science teaching license, we strongly recommend that courses in Biology, Astronomy, Geology, etc. are included in the elective credits.

Second Language Requirement

For the Bachelor of Arts with a major in Chemistry there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
ENGL 1110G or ENGL 1110H	Composition I ¹ or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I ¹ or Calculus and Analytic Geometry I Honors	4

CHEM 1215G or CHEM 1216	General Chemistry I Lecture and Laboratory for STEM Majors or General Chemistry I Lecture and Laboratory for CHEM Majors	4
CHEM 2111	Explorations in Chemistry and Biochemistry	1
Area IV: Social and Behavioral Science Course ²		3

Credits 16

Semester 2		Credits
ENGL 2210G or ENGL 2210H	Professional and Technical Communication ¹ or Professional and Technical Communication	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II ¹ or Calculus and Analytic Geometry II Honors	4
CHEM 1225G or CHEM 1216	General Chemistry II Lecture and Laboratory for STEM Majors or General Chemistry I Lecture and Laboratory for CHEM Majors	4
Area V: Humanities Course ²		3
Elective Course		3

Credits 17

Second Year		Credits
Semester 1		Credits
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
CHEM 313	Organic Chemistry I ¹	3
CHEM 371	Analytical Chemistry ¹	4
Select one of the following:		4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics ¹	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab ¹	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
PHYS 1310G & PHYS 1310L	Calculus-Based Physics I and Calculus-Based Physics I Lab	
SPED 3105	Introduction to Special Education in a Diverse Society	3

Credits 17

Semester 2		Credits
CHEM 314 & CHEM 315	Organic Chemistry II and Organic Chemistry Laboratory ¹	5
Select one of the following:		4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory ¹	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab ¹	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II ¹	
PHYS 1320G & PHYS 1320L	Calculus-Based Physics II and Calculus-Based Physics II Lab ¹	
Elective Course		3
Area VI: Creative and Fine Arts Course ²		3

Credits 15

Third Year		Credits
Semester 1		Credits
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
VWW: Viewing a Wider World Course ³		3

EDUC 3120	Multicultural Education	3
EDUC 3997	Secondary Field Experience	3
Elective Course		3
Credits		15
Semester 2		
CHEM Upper-Division Elective Course ¹		3
Elective Course		12
Choose one from the following: ⁴		
CHEM 456	Inorganic Structure and Bonding	
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	
Credits		15
Fourth Year		
Semester 1		
EDUC 4410	Teaching Science at the Middle and High School Level	3
READ 4330	Content Area Literacy	3
Elective Course		3
Choose one from the following: ⁴		3
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory (if CHEM 456 or CHEM 472 was not completed in the previous term)	
Elective Course (3 credits)		
Credits		12
Semester 2		
CHEM 443	Senior Seminar	1
EDUC 4820	Secondary Student Teaching	9
EDUC 4821	Middle and High School Student Teaching Seminar	3
Credits		13
Total Credits		120

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/>) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext>) section of the catalog for a full list of courses.

⁴ Selection course option - Departmental requirement includes a choice of one of the following: CHEM 456 Inorganic Structure and Bonding, CHEM 471 Advanced Integrated Inorganic and Physical Chemistry Laboratory, or CHEM 472 Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory. If the student wishes to now take the CHEM offerings in the specific term they should add an elective course for 3 credits, however, the student must complete at least one of the above courses.