

# CHEMISTRY (PRE-MED) - BACHELOR OF ARTS

The Bachelor of Arts curriculum is designed to provide flexibility with less depth in chemistry, physics, and mathematics. The concentration in Pre-Medical Studies provides foundational knowledge to students who are preparing to take the MCAT exam. Graduates will successfully complete medical school pre-requisite coursework and obtain an interdisciplinary understanding of healthcare that includes scientific, humanistic, and social science perspectives. Students may not receive both a Bachelor of Science in Biochemistry degree and a Bachelor of Arts in Chemistry (Pre-Med concentration) degree. All departmental and nondepartmental requirements may not be taken S/U and must earn a C- or better final grade.

## 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
<b>General Education</b>		
<i>Area I: Communications</i>		10
<i>English Composition - Level 1</i> <sup>1</sup>		
<i>English Composition - Level 2</i> <sup>1</sup>		
<i>Oral Communication</i> <sup>1</sup>		
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I <sup>2</sup>	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 <sup>4</sup>	
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors <sup>4</sup>	
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
<i>Area IV: Social/Behavioral Sciences Course (3 credits)</i> <sup>1</sup>		
<i>Area V: Humanities</i> <sup>1</sup>		3
<i>Area VI: Creative and Fine Arts</i> <sup>1</sup>		3
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
<b>Viewing A Wider World</b> <sup>3</sup>		6
<b>Departmental/College Requirements</b>		
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
BCHE 395	Biochemistry I	3
or BCHE 395H	Biochemistry I Honors	
BCHE 396	Biochemistry II, Lecture and Laboratory	4
or BCHE 396 H	Biochemistry II Honors, Lecture and Laboratory	
TOX 361	Basic Toxicology	3
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	
Upper division Chemistry Elective <sup>5</sup>		3
<b>Non-Departmental Requirements (in addition to Gen.Ed/VWW)</b>		
Select one from the following:		4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics <sup>6</sup>	
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 <sup>7</sup>	
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	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 2110L	Principles of Biology: Cellular and Molecular Biology Laboratory	1
BIOL 305	Principles of Genetics	3
or GENE 320	Hereditary and Population Genetics	
Select one from the following:		6-7
SPMD 2210 & SPMD 2225	Anatomy and Physiology I and Anatomy and Physiology II	
BIOL 353 & BIOL 354	Pre-Professional Human Anatomy and Physiology of Humans	
BIOL 377	Cell Biology	3
HNRS 413	Medical Shadowing	2
SOCI 1110G	Introduction to Sociology	3
Select 4 Pre-Med elective courses from the following:		12
ANTH 355	Biological Anthropology	
ANTH 357V	Medical Anthropology	
ANTH 402	Contemporary Medical Anthropology	
ANTH 435	Human Health and Biological Variation	
BIOL 311	General Microbiology	
BIOL 385	An Introduction to Cancer	
BIOL 474	Immunology	
SPMD 3050	Therapeutic Modalities	

SPMD 4450	Pathophysiology and Human Function(s)	
SPMD 4510	Neurophysiology and Human Function	
PHLS 4610	Health Disparities: Determinants and Interventions	
PHLS 4620V	Cross-Cultural Aspects of Health	
PHLS 3130V	Global Environmental Health Issues	
PHLS 3120V	Women's Health Issues	
SOCI 3120V	Introduction to Population Studies	
SOCI 3245V	Comparative Family Systems	
<b>Second Language Requirement: (not required)</b>		
<b>Electives, to bring the total credits to 120</b>		
Select sufficient electives to bring total credits to 120, including 48 upper-division. <sup>9</sup>		5-6
<b>Total Credits</b>		<b>121</b>

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

<sup>2</sup> 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.

<sup>3</sup> 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

<sup>4</sup> 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.

<sup>5</sup> The additional chemistry course can be one 3-credit CHEM course or three 1-credit CHEM courses.

<sup>6</sup> 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.

<sup>7</sup> 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.

<sup>8</sup> Students are strongly encouraged to check prerequisite/corequisite requirements for Physics labs when schedule planning.

<sup>9</sup> 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.

## 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 <sup>1</sup> or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I <sup>1</sup> 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
SOCI 1110G	Introduction to Sociology	3
<b>Credits</b>		<b>16</b>

### Semester 2

ENGL 2210G or ENGL 2210H	Professional and Technical Communication <sup>1</sup> or Professional and Technical Communication	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II <sup>1</sup> or Calculus and Analytic Geometry II Honors	4
CHEM 1225G or CHEM 1226	General Chemistry II Lecture and Laboratory for STEM Majors or General Chemistry II Lecture and Laboratory for CHEM Majors	4
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 2110L	Principles of Biology: Cellular and Molecular Biology Laboratory	1
Area V: Humanities Course <sup>2</sup>		3
<b>Credits</b>		<b>18</b>

### Second Year

Semester 1		Credits
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
CHEM 313	Organic Chemistry I <sup>1</sup>	3
CHEM 371	Analytical Chemistry <sup>1</sup>	4
Select one of the following:		4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics <sup>1</sup>	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab <sup>1</sup>	
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	

BIOL 305 or GENE 320	Principles of Genetics or Hereditary and Population Genetics	3
<b>Credits</b>		<b>17</b>

**Semester 2**

CHEM 314 & CHEM 315	Organic Chemistry II and Organic Chemistry Laboratory <sup>1</sup>	5
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Select one of the following:		4
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PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory <sup>1</sup>	
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PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab <sup>1</sup>	
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PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II <sup>1</sup>	
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PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab <sup>1</sup>	
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SPMD 2210 or BIOL 353	Anatomy and Physiology I or Pre-Professional Human Anatomy	3
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Area VI: Creative and Fine Arts Course <sup>2</sup>		3
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<b>Credits</b>		<b>15</b>
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**Third Year****Semester 1**

CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
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BCHE 395 or BCHE 395H	Biochemistry I or Biochemistry I Honors	3
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SPMD 2225 or BIOL 354	Anatomy and Physiology II or Physiology of Humans	3
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HNRS 413	Medical Shadowing	2
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VWW: Viewing a Wider World Course <sup>4</sup>		3
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Pre-Med Elective Course		3
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<b>Credits</b>		<b>17</b>
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**Semester 2**

Pre-Med Elective Course <sup>3</sup>		3
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BCHE 396 or BCHE 396 H	Biochemistry II, Lecture and Laboratory or Biochemistry II Honors, Lecture and Laboratory	4
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BIOL 377	Cell Biology	3
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Choose one from the following: <sup>5</sup>		3
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CHEM 456	Inorganic Structure and Bonding	
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CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	
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<b>Credits</b>		<b>13</b>
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**Fourth Year****Semester 1**

VWW: Viewing a Wider World Course <sup>4</sup>		3
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Pre-Med Elective Course <sup>3</sup>		3
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Elective Course		3
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Choose one from the following: <sup>5</sup>		3
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CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory (if CHEM 456 or CHEM 472 was not completed in the previous term)	
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Elective Course (3 credits)		
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<b>Credits</b>		<b>12</b>
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**Semester 2**

CHEM 443	Senior Seminar <sup>1</sup>	1
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TOX 361	Basic Toxicology	3
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Pre-Med Elective Course <sup>3</sup>		3
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Pre-Med Elective Course <sup>3</sup>	3
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Elective Course	3
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<b>Credits</b>		<b>13</b>
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<b>Total Credits</b>		<b>121</b>
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<sup>1</sup> These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

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

<sup>3</sup> The Emphasis area is composed of courses outside either chemistry or biochemistry degrees (non-departmental and departmental requirements cannot be used for emphasis area credit). These courses must have a common theme, which complement (whenever possible) principles learned on either chemistry or biochemistry. For example, astronomy and physics courses could be taken as an emphasis area in astrophysics. See a faculty mentor for approval of the courses to be used for an emphasis area. A minimum of 18 credits can be used as an Emphasis area (which could constitute a minor in some cases), but at least nine credits must be upper – division.

<sup>4</sup> 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.

<sup>5</sup> 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.