

# BIOCHEMISTRY - BACHELOR OF SCIENCE

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. All departmental and nondepartmental requirements may not be taken S/U and must earn a C- or better final grade.

Prefix	Title	Credits
<b>General Education</b>		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i> <sup>1</sup>		4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional and Technical Communication Honors (Recommended)	3
<i>Oral Communication</i>		
COMM 1115G	Introduction to Communication (Recommended)	3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I <sup>2</sup>	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors <sup>3</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>3</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>4</sup>		6
<b>Departmental/College Requirements</b>		
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
CHEM 371	Analytical Chemistry	4
BCHE 140	Introduction to Biochemistry	1
or CHEM 2111	Explorations in Chemistry and Biochemistry	
BCHE 395	Biochemistry I	3
BCHE 396 H	Biochemistry II Honors, Lecture and Laboratory	4
BCHE 440	Biochemistry Seminar	1
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory	3
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	3
Select two of the following:		6

BCHE 432	Physical Biochemistry	
BCHE 451	Special Topics	
CHEM 451	Special Topics (by petition only)	
CHEM 456	Inorganic Structure and Bonding	
<b>Non-Departmental Requirements (in addition to Gen.Ed/VWW)</b>		
A ST 311	Statistical Applications	3
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 311	General Microbiology	3
BIOL 311 L	General Microbiology Laboratory	2
BIOL 305	Principles of Genetics	3
or GENE 320	Hereditary and Population Genetics	
BIOL 377	Cell Biology	3
Select one from the following:		3
PHYS 2110	Mechanics <sup>5</sup>	
PHYS 1230G	Algebra-Based Physics I	
PHYS 2230G	General Physics for Life Science I	
PHYS 1310G	Calculus-Based Physics I	
Select one from the following:		3
PHYS 2140	Electricity and Magnetism <sup>6</sup>	
PHYS 1240G	Algebra-Based Physics II	
PHYS 2240G	General Physics for Life Science II	
PHYS 1320G	Calculus-Based Physics II	
Select one from the following:		1
PHYS 2110L	Experimental Mechanics <sup>7</sup>	
PHYS 1230L	Algebra-Based Physics I Lab	
PHYS 2230L	Laboratory to General Physics for Life Science I	
PHYS 1310L	Calculus-Based Physics I Lab	
Select one from the following:		1
PHYS 2140L	Electricity & Magnetism Laboratory <sup>7</sup>	
PHYS 1240L	Algebra-Based Physics II Lab	
PHYS 2240L	Laboratory to General Physics for Life Science II	
PHYS 1320L	Calculus-Based Physics II Lab	
<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.		17
<b>Total Credits</b>		<b>120</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> 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>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> PHYS 2110 Mechanics is the recommended Physics I course for B.S. 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>6</sup> PHYS 2140 Electricity and Magnetism is the recommended Physics II course for B.S. 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>7</sup> Students are strongly encouraged to verify prerequisite/corequisite requirements for Physics labs when schedule planning.

## Second Language Requirement

For the Bachelor of Science with a major in Biochemistry 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	Composition I <sup>1</sup>	4
MATH 1511G	Calculus and Analytic Geometry I <sup>1</sup>	4
CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	4
BCHE 140	Introduction to Biochemistry	1
Area IV: Social and Behavioral Science Course <sup>2</sup>		3

**Credits** **16**

### Semester 2

MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II <sup>1</sup> or Calculus and Analytic Geometry II Honors	4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory <sup>1</sup>	4
CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	4
Area V: Humanities Course <sup>2</sup>		3

**Credits** **15**

### Second Year

#### Semester 1

BIOL 305 or GENE 320	Principles of Genetics <sup>1</sup> or Hereditary and Population Genetics	3
CHEM 313	Organic Chemistry I <sup>1</sup>	3
CHEM 371	Analytical Chemistry	4
Choose from 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 <sup>1</sup>	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab <sup>1</sup>	
Area VI: Creative and Fine Arts Course <sup>2</sup>		3

**Credits** **17**

### Semester 2

COMM 1115G	Introduction to Communication	3
ENGL 2210G	Professional and Technical Communication Honors	3
CHEM 314 & CHEM 315	Organic Chemistry II and Organic Chemistry Laboratory <sup>1</sup>	5

Choose from one of the following: **4**

PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory <sup>1</sup>	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab <sup>1</sup>	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II <sup>1</sup>	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab <sup>1</sup>	

**Credits** **15**

### Third Year

#### Semester 1

A ST 311	Statistical Applications <sup>1</sup>	3
BIOL 377	Cell Biology <sup>1</sup>	3
BCHE 395	Biochemistry I <sup>1</sup>	3
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
Elective Course		3

**Credits** **15**

#### Semester 2

BCHE 396 H	Biochemistry II Honors, Lecture and Laboratory	0-4
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory <sup>1</sup>	5
VWW: Viewing a Wider World Course <sup>3</sup>		3
Elective Course		3
Elective Course		3

**Credits** **18-14**

### Fourth Year

#### Semester 1

BCHE 440	Biochemistry Seminar <sup>1</sup>	1
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory	3
Elective Course		3
Elective Course		3
Elective Course		2

**Credits** **12**

#### Semester 2

CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	3
Select two of the following:		6
BCHE 432	Physical Biochemistry <sup>4</sup>	
BCHE 451	Special Topics	
CHEM 456	Inorganic Structure and Bonding	
CHEM 451	Special Topics (by petition)	

VWW: Viewing a Wider World Course <sup>3</sup>	3
<b>Credits</b>	<b>12</b>
<b>Total Credits</b>	<b>120-116</b>

<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> 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> The BCHE 432 Physical Biochemistry is highly recommended for all Biochemistry majors.