

# CHEMISTRY, BACHELOR OF ARTS

## Requirements

### Total Course Requirements for the Bachelor's Degree

See the "Requirements for the Bachelor's Degree (<https://catalog.csudh.edu/general-information/baccalaureate-degrees-undergraduate-studies/>)" in the University Catalog for complete details on general degree requirements. A minimum of 40 units, including those required for the major, must be upper division.

### Elective Requirements

Completion of elective courses (beyond the requirements listed below) to reach a total of a minimum of 120 units.

### General Education Requirements (49 units)

See the "General Education (<https://catalog.csudh.edu/general-education/>)" requirements in the University Catalog or the Class Schedule for the most current information on General Education requirements and course offerings.

### Graduation Writing Assessment Requirement

See the "Graduation Writing Assessment Requirement (<https://catalog.csudh.edu/general-information/baccalaureate-degrees-undergraduate-studies/gwar-certifying-courses/>)" in the University Catalog.

### Minor Requirements

No minor required.

### Major Requirements (60-62 units)

Students must select one of the options listed. The following courses, or their approved transfer equivalents, are required of all candidates for this degree. A grade of "C" or better must be achieved in all courses.

Each B.A. Chemistry major must select one of the options listed below:

#### Biochemistry Option (62-64 units)

Code	Title	Hours
<b>Lower Division Required Courses</b>		
CHE 110	General Chemistry I	5
CHE 112	General Chemistry II	5
CHE 230	Quantitative Analysis	4
MAT 191	Calculus I	5
MAT 193	Calculus II	5
Select one of the following:		8-10
PHY 130 & PHY 132	General Physics I and General Physics II	
PHY 120 & PHY 122	Elements Of Physics I and Elements Of Physics II	

#### Upper Division Required Courses

CHE 310	Organic Chemistry I	4
CHE 311	Organic Chemistry Lab I	1
CHE 312	Organic Chemistry II	3
CHE 313	Organic Chemistry Laboratory II	2
CHE 320	Physical Chemistry I	5
CHE 420	Advanced Applic for Chemistry	2

CHE 450	Biochemistry I	4
CHE 451	Biochemistry I Lab	1
CHE 452	Biochemistry II	4
CHE 453	Biochemistry II Lab	2
CHE 460	Chemical Literature	2
<b>Total Hours</b>		<b>62-64</b>

#### General Chemistry Option (63 units)

Code	Title	Hours
<b>Lower Division Required Courses</b>		
CHE 110	General Chemistry I	5
CHE 112	General Chemistry II	5
CHE 230	Quantitative Analysis	4
MAT 191	Calculus I	5
MAT 193	Calculus II	5
PHY 130	General Physics I	5
PHY 132	General Physics II	5
<b>Upper Division Required Courses</b>		
CHE 310	Organic Chemistry I	4
CHE 311	Organic Chemistry Lab I	1
CHE 312	Organic Chemistry II	3
CHE 313	Organic Chemistry Laboratory II	2
CHE 320	Physical Chemistry I	5
CHE 322	Physical Chemistry II	3
CHE 420	Advanced Applic for Chemistry	2
CHE 431	Adv Integrated Lab I Lec	3
CHE 440	Inorganic Chemistry	4
CHE 460	Chemical Literature	2
<b>Total Hours</b>		<b>63</b>

CHE 450 Biochemistry I: Major students may substitute this course for General Education Area E. Please contact the University Advisement Center to request the course substitution.

## Program Learning Outcomes

1. general familiarity with the following areas in chemistry: analytical, biochemistry, inorganic, organic and physical.
2. developed formal (abstract) thinking skills as well as concrete thinking skills.
3. learned how to think critically and analyze chemical problems
4. the ability to work effectively and safely in a laboratory environment.
5. the ability to work in teams as well as independently.
6. the ability to communicate effectively, both orally and in writing.

### General Chemistry Option Roadmaps

#### 4- Degree Roadmap

Course	Title	Hours
<b>First Year</b>		
<b>Fall</b>		
GE Area A2 Composition I		3
GE Area E Lifelong Learning and Self-Development		3
MAT 191	Calculus I (satisfies GE Area B4)	5
CHE 110	General Chemistry I (satisfies GE Area B1 and B3)	5
<b>Hours</b>		<b>16</b>

<b>Spring</b>		
GE Area A2 Composition II		3
CHE 112	General Chemistry II	5
MAT 193	Calculus II	5
GE Area C1 or C2		3
<b>Hours</b>		<b>16</b>
<b>Second Year</b>		
<b>Fall</b>		
GE Area A3 Logic/Critical Thinking		3
CHE 230	Quantitative Analysis	4
PHY 130	General Physics I	5
HIS 101	History Of United States	3
<b>Hours</b>		<b>15</b>
<b>Spring</b>		
POL 101	American Institutions	3
GE Area A1 Oral Communication		3
GE Area C1 or C2		3
GE Area D1 or D2		3
PHY 132	General Physics II	5
<b>Hours</b>		<b>17</b>
<b>Third Year</b>		
<b>Fall</b>		
CHE 310	Organic Chemistry I	4
CHE 311	Organic Chemistry Lab I	1
CHE 320	Physical Chemistry I	5
GE Area D1 or D2		3
Additional lower division GE in Area C1 or C2		3
<b>Hours</b>		<b>16</b>
<b>Spring</b>		
GE Area F Ethnic Studies		3
ENG 350	Advanced Composition (or other GVAR satisfying course; see counselor)	3
CHE 312	Organic Chemistry II	3
CHE 313	Organic Chemistry Laboratory II	2
CHE 322	Physical Chemistry II	3
CHE 420	Advanced Applic for Chemistry	2
<b>Hours</b>		<b>16</b>
<b>Fourth Year</b>		
<b>Fall</b>		
GE Area B5 Integrative Studies in Natural Sciences		3
CHE 431	Adv Integrated Lab I Lec	3
Elective to meet 120 units		3
Lower division GE in Area B2 Life Sciences		3
<b>Hours</b>		<b>12</b>
<b>Spring</b>		
CHE 440	Inorganic Chemistry	4
CHE 460	Chemical Literature	2
GE Area D3 Integrative Studies in the Social Sciences		3
GE Area C3 Integrative Studies in the Humanities		3
<b>Hours</b>		<b>12</b>
<b>Total Hours</b>		<b>120</b>

2- Year Roadmap (transfer students)

Course	Title	Hours
<b>First Year</b>		
<b>Fall</b>		
GE Area C3 Integrative Studies in the Humanities		3
CHE 310	Organic Chemistry I	4
CHE 311	Organic Chemistry Lab I	1
CHE 320	Physical Chemistry I	5

Elective to meet 120 units		3
<b>Hours</b>		<b>16</b>
<b>Spring</b>		
GE Area B5 Integrative Studies in Natural Sciences		3
CHE 312	Organic Chemistry II	3
CHE 313	Organic Chemistry Laboratory II	2
CHE 322	Physical Chemistry II	3
CHE 420	Advanced Applic for Chemistry	2
ENG 350	Advanced Composition (or other GVAR satisfying course; see counselor)	3
<b>Hours</b>		<b>16</b>
<b>Second Year</b>		
<b>Fall</b>		
GE Area D3 Integrative Studies in the Social Sciences		3
CHE 431	Adv Integrated Lab I Lec	3
Elective to meet 120 units		3
Elective to meet 120 units		3
Elective to meet 120 units		1
<b>Hours</b>		<b>13</b>
<b>Spring</b>		
CHE 440	Inorganic Chemistry	4
CHE 460	Chemical Literature	2
Elective to meet 120 units		3
Elective to meet 120 units		3
Elective to meet 120 units		3
<b>Hours</b>		<b>15</b>
<b>Total Hours</b>		<b>60</b>

Biochemistry Option Roadmaps  
4- Year Roadmap

Course	Title	Hours
<b>First Year</b>		
<b>Fall</b>		
GE Area A2 Composition I		3
CHE 110	General Chemistry I	5
MAT 191	Calculus I	5
HIS 101	History Of United States	3
<b>Hours</b>		<b>16</b>
<b>Spring</b>		
GE Area A2 Composition II		3
CHE 112	General Chemistry II	5
MAT 193	Calculus II	5
POL 101	American Institutions	3
<b>Hours</b>		<b>16</b>
<b>Second Year</b>		
<b>Fall</b>		
CHE 230	Quantitative Analysis	4
GE Area A3 Logic/Critical Thinking		3
GE Area C1 or C2		3
GE Area D1 or D2		3
PHY 120 or PHY 130	Elements Of Physics I or General Physics I	4
<b>Hours</b>		<b>17</b>
<b>Spring</b>		
GE Area C1 or C2		3
GE Area D1 or D2		3
GE Area A1 Oral Communication		3
GE Area B2 Life Science		3
PHY 122 or PHY 132	Elements Of Physics II or General Physics I	4
<b>Hours</b>		<b>16</b>

Third Year			CHE 460	Chemical Literature	2	
Fall			CHE 452	Biochemistry II	4	
CHE 310	Organic Chemistry I	4	GE Area B5 Integrative Studies in Natural Sciences			3
CHE 311	Organic Chemistry Lab I	1	Elective to meet 120 units			3
CHE 320	Physical Chemistry I	5				
GE Area F Ethnic Studies		3				
GE Area E Lifelong Learning and Self-Development		3				
Hours		16				
Spring						
CHE 420	Advanced Applic for Chemistry	2				
GE Area C3 Integrative Studies in the Humanities		3				
CHE 312	Organic Chemistry II	3				
CHE 313	Organic Chemistry Laboratory II	2				
ENG 350	Advanced Composition (or other GVAR satisfying course; see counselor)	3				
Hours		13				
Fourth Year						
Fall						
GE Area B5 Integrative Studies in Natural Sciences		3				
Elective to meet 120 units		3				
Elective to meet 120 units		3				
CHE 450	Biochemistry I	4				
CHE 451	Biochemistry I Lab	1				
Hours		14				
Spring						
CHE 452	Biochemistry II	4				
CHE 453	Biochemistry II Lab	2				
CHE 460	Chemical Literature	2				
GE Area D3 Integrative Studies in the Social Sciences		3				
Elective to meet 120 units		1				
Hours		12				
Total Hours		120				

CHE 460	Chemical Literature	2
CHE 452	Biochemistry II	4
GE Area B5 Integrative Studies in Natural Sciences		3
Elective to meet 120 units		3
Hours		14
Total Hours		60

## 2-Year Roadmap (transfer students)

Course	Title	Hours
<b>First Year</b>		
<b>Fall</b>		
CHE 310	Organic Chemistry I	4
CHE 311	Organic Chemistry Lab I	1
CHE 320	Physical Chemistry I	5
Elective to meet 120 units		3
Elective to meet 120 units		3
<b>Hours</b>		<b>16</b>
<b>Spring</b>		
CHE 420	Advanced Applic for Chemistry	2
CHE 312	Organic Chemistry II	3
CHE 313	Organic Chemistry Laboratory II	2
GE Area C3 Integrative Studies in the Humanities		3
Elective to meet 120 units		3
ENG 350	Advanced Composition (or other GVAR satisfying course; see counselor)	3
<b>Hours</b>		<b>16</b>
<b>Second Year</b>		
<b>Fall</b>		
CHE 450	Biochemistry I	4
CHE 451	Biochemistry I Lab	1
GE Area D3 Integrative Studies in the Social Sciences		3
Elective to meet 120 units		3
Elective to meet 120 units		3
<b>Hours</b>		<b>14</b>
<b>Spring</b>		
CHE 453	Biochemistry II Lab	2