

Program Modification

Program modifications must be submitted by October 15, 2013, and finalized by the end of that fall semester for catalog production.

Enter data in **YELLOWED** areas.

Date (Change date if modified and update the file name with the new date): 2014 2015 Catalog Copy 8.26.13

Program Area: **Chemistry: Biochemistry Option, B.S.**

Semester /Year First affected: FALL 2014

Instructions: Please use this Program Modification form for changes to existing program requirements, units, outcomes, emphases or options, or for other programmatic concerns. For minor changes (faculty or address changes, additions of approved electives, minor editing for clarity, and other minor updates) use the Program Update form, available at the Curriculum website.

Paste the latest approved version of your entire program in the left AND right boxes below. Make your deletions in the LEFT column by using the strikeout feature in Word or underlining, **and highlight**. Insert new language or other changes to the program on the RIGHT and highlight in **YELLOW** for easy identification. If possible, please align the two columns so that changes appear side-by-side with the original text.

SUMMARY OF CHANGES

The combined lecture and lab CHEM 460 has been broken into two courses CHEM 460 and CHEM 461. The combined lecture and lab CHEM 461 has broken into two courses, CHEM 462 and CHEM 463.

JUSTIFICATION

Splitting these courses allows students more flexibility in their scheduling.

CURRENTLY APPROVED PROGRAM

PROPOSED PROGRAM

CURRENTLY APPROVED PROGRAM		PROPOSED PROGRAM	
Chemistry: Biochemistry Option, B.S.		Chemistry: Biochemistry Option, B.S.	
(120 units)		(120 units)	
Summary of Units		Summary of Units	
Lower Division Requirements	36	Lower Division Requirements	36
Upper Division Requirements	31	Upper Division Requirements	31

Upper Division Chemistry Electives	3
Required Supporting, Other GE and Elective Courses	50
Total Units Required	120
Lower Division Requirements - 36 units	
<i>Students must obtain a grade of C or better in these courses to apply them to the chemistry major.</i>	
1. Chemistry	
• CHEM 121 - General Chemistry I Units: 4 • CHEM 122 - General Chemistry II Units: 4 • CHEM 250 - Quantitative Analysis Units: 3 • CHEM 251 - Quantitative Analysis Laboratory Units: 1	
2. Biology	
• BIOL 200 - Principles of Organismal and Population Biology Units: 4 • BIOL 201 - Principles of Cell and Molecular Biology Units: 4	
3. Math	
• MATH 150 - Calculus I Units: 4 • MATH 151 - Calculus II Units: 4	
4. Physics	
Choose one of the following:	

Upper Division Chemistry Electives	3
Required Supporting, Other GE and Elective Courses	50
Total Units Required	120
Lower Division Requirements - 36 units	
<i>Students must obtain a grade of C or better in these courses to apply them to the chemistry major.</i>	
1. Chemistry	
• CHEM 121 - General Chemistry I Units: 4 • CHEM 122 - General Chemistry II Units: 4 • CHEM 250 - Quantitative Analysis Units: 3 • CHEM 251 - Quantitative Analysis Laboratory Units: 1	
2. Biology	
• BIOL 200 - Principles of Organismal and Population Biology Units: 4 • BIOL 201 - Principles of Cell and Molecular Biology Units: 4	
3. Math	
• MATH 150 - Calculus I Units: 4 • MATH 151 - Calculus II Units: 4	
4. Physics	
Choose one of the following:	

- [PHYS 100 - Introduction to Physics I](#) Units: 4
- [PHYS 200 - General Physics I](#) Units: 4

Choose one of the following:

-
- [PHYS 101 - Introduction to Physics II](#) Units: 4
 - [PHYS 201 - General Physics II](#) Units: 4

Upper Division Requirements - 31 units

Students must obtain a grade of C or better in these courses to apply them to the chemistry major.

1. Chemistry

-
- [CHEM 305 - Computer Applications in Chemistry](#) Units: 1
 - [CHEM 311 - Organic Chemistry I](#) Units: 3
 - [CHEM 312 - Organic Chemistry I Laboratory](#) Units: 1
 - [CHEM 314 - Organic Chemistry II](#) Units: 3
 - [CHEM 315 - Organic Chemistry II Laboratory](#) Units: 1
 - [CHEM 371 - Physical Chemistry I](#) Units: 3
 - [CHEM 372 - Physical Chemistry Laboratory](#) Units: 1
 - [CHEM 460 - Biochemistry I](#) Units: 4
 - [CHEM 461 - Biochemistry II](#) Units: 4
 - [CHEM 499 - Chemistry Capstone](#) Units: 2

- [PHYS 100 - Introduction to Physics I](#) Units: 4
- [PHYS 200 - General Physics I](#) Units: 4

Choose one of the following:

-
- [PHYS 101 - Introduction to Physics II](#) Units: 4
 - [PHYS 201 - General Physics II](#) Units: 4

Upper Division Requirements - 31 units

Students must obtain a grade of C or better in these courses to apply them to the chemistry major.

1. Chemistry

-
- [CHEM 305 - Computer Applications in Chemistry](#) Units: 1
 - [CHEM 311 - Organic Chemistry I](#) Units: 3
 - [CHEM 312 - Organic Chemistry I Laboratory](#) Units: 1
 - [CHEM 314 - Organic Chemistry II](#) Units: 3
 - [CHEM 315 - Organic Chemistry II Laboratory](#) Units: 1
 - [CHEM 371 - Physical Chemistry I](#) Units: 3
 - [CHEM 372 - Physical Chemistry Laboratory](#) Units: 1
 - [CHEM 460 - Biochemistry I](#) Units: 3
 - [CHEM 461 - Biochemistry Lab](#) Units: 1^L
 - [CHEM 462 - Biochemistry II](#) Units: 3

2. Biology

- [BIOL 300 - Cell Biology](#) Units: 4
- [BIOL 400 - Molecular Biology](#) Units: 4

Note:

(Thirteen units of the above requirements will be counted toward lower-division GE Categories B1, B2, B3, & B4)

Upper Division Chemistry Electives - 3 units

Students must obtain a grade of C or better in these courses to apply them to the chemistry major.

A total of 3 units of electives from those listed below are needed. Lab courses are denoted ^L.

- [CHEM 301 - Environmental Chemistry - Atmosphere and Climate](#) Units: 3
- [CHEM 302 - Environmental Chemistry - Soil and Water](#) Units: 4 ^L
- [CHEM 313 - Organic Chemistry I Problem Solving](#) Units: 1
- [CHEM 316 - Organic Chemistry II Problem Solving](#) Units: 1
- [CHEM 330 - The History of Science: Nonwestern Origins and the Western Revolution \(Cross-listed as HIST 330\)](#) Units: 3 ^L
- [CHEM 335 - The Chemistry of the Kitchen](#) Units: 3 ^{L, I}
- [CHEM 341 - Drug Discovery and Development \(Cross-listed as ECON 341, BUS 341\)](#) Units: 3 ^I
- [CHEM 343 - Forensic Science](#) Units: 3 ^{L, I}

- [CHEM^L 463 – Advanced Biochemistry Lab](#) Units: 1 ^L

- [CHEM 499 - Chemistry Capstone](#) Units: 2

2. Biology

- [BIOL 300 - Cell Biology](#) Units: 4
- [BIOL 400 - Molecular Biology](#) Units: 4

Note:

(Thirteen units of the above requirements will be counted toward lower-division GE Categories B1, B2, B3, & B4)

Upper Division Chemistry Electives - 3 units

Students must obtain a grade of C or better in these courses to apply them to the chemistry major.

A total of 3 units of electives from those listed below are needed. Lab courses are denoted ^L.

- [CHEM 301 - Environmental Chemistry - Atmosphere and Climate](#) Units: 3
- [CHEM 302 - Environmental Chemistry - Soil and Water](#) Units: 4 ^L
- [CHEM 313 - Organic Chemistry I Problem Solving](#) Units: 1
- [CHEM 316 - Organic Chemistry II Problem Solving](#) Units: 1
- [CHEM 330 - The History of Science: Nonwestern Origins and the Western Revolution \(Cross-listed as HIST 330\)](#) Units: 3 ^L
- [CHEM 335 - The Chemistry of the Kitchen](#) Units: 3 ^{L, I}
- [CHEM 341 - Drug Discovery and Development \(Cross-listed as ECON 341,](#)

- [CHEM 344 - Energy and Society \(Cross-listed as PHYS 344\)](#) Units: 3 ^I
- [CHEM 373 - Physical Chemistry II](#) Units: 3
- [CHEM 410 - Advanced Organic Synthesis](#) Units: 4 ^L
- [CHEM 415 - Molecular Structure Determination](#) Units: 4 ^L
- [CHEM 420 - Advanced Inorganic Chemistry](#) Units: 3
- [CHEM 450 - Instrumental Analysis and Laboratory](#) Units: 4 ^L
- [CHEM 465 - Bioinorganic Chemistry](#) Units: 4 ^L
- [CHEM 490 - Special Topics in Chemistry](#) Units: 1-3
- [CHEM 491 - Special Laboratory Topics in Chemistry](#) Units: 1-3 ^L
- [CHEM 492 - Internship/Service Learning](#) Units: 1-3 ^{L, R}
- [CHEM 494 - Independent Research](#) Units: 1-3 ^{L, R}
- [CHEM 497 - Directed Studies](#) Units: 1-3 ^R

Note:

^I Upper-division interdisciplinary GE credit ([CHEM 330](#) -349 or CHEM 430-449) may be applied as chemistry electives towards the degree.

^R No more than a combined total of 6 units of [CHEM 492](#), [CHEM 494](#), and [CHEM 497](#) may be applied as electives. No more than one [CHEM 492](#) or [CHEM 494](#) may be (by petition) considered a laboratory elective.

Required Supporting, Other GE & Elective Courses - 47 units

American Institutions Requirement	6
Other Courses in GE Categories A-E	36
Electives in Any Discipline	5

[BUS 341](#) Units: 3 ^I

- [CHEM 343 - Forensic Science](#) Units: 3 ^{L, I}
- [CHEM 344 - Energy and Society \(Cross-listed as PHYS 344\)](#) Units: 3 ^I
- [CHEM 345 – Science/Fiction](#) Units: 3 ^I
- [CHEM 373 - Physical Chemistry II](#) Units: 3
- [CHEM 410 - Advanced Organic Synthesis](#) Units: 4 ^L
- [CHEM 415 - Molecular Structure Determination](#) Units: 4 ^L
- [CHEM 420 - Advanced Inorganic Chemistry](#) Units: 3
- [CHEM 450 - Instrumental Analysis and Laboratory](#) Units: 4 ^L
- [CHEM 465 - Bioinorganic Chemistry](#) Units: 4 ^L
- [CHEM 480 – Beer, Wine, and Spirits: The Art and Science and Fermentation](#) Units: 4 ^L
- [CHEM 490 - Special Topics in Chemistry](#) Units: 1-3
- [CHEM 491 - Special Laboratory Topics in Chemistry](#) Units: 1-3 ^L
- [CHEM 492 - Internship/Service Learning](#) Units: 1-3 ^{L, R}
- [CHEM 494 - Independent Research](#) Units: 1-3 ^{L, R}
- [CHEM 497 - Directed Studies](#) Units: 1-3 ^R

Note:

^I Upper-division interdisciplinary GE credit ([CHEM 330](#) -349 or CHEM 430-449) may be applied as chemistry electives towards the degree.

^R No more than a combined total of 6 units of [CHEM 492](#), [CHEM 494](#), and [CHEM 497](#) may be applied as electives. No more than one [CHEM 492](#) or [CHEM 494](#) may be (by petition) considered a laboratory elective.

	Required Supporting, Other GE & Elective Courses - 47 units	
	American Institutions Requirement	6
	Other Courses in GE Categories A-E	36
	Electives in Any Discipline	5

Proposer of Program Modification

Date

APPROVAL SHEET

Program:

If your course has a General Education Component or involves Center affiliation, the Center will also sign off during the approval process.

Multiple Chair fields are available for cross-listed courses.

The CI program review process includes a report from the respective department/program on its progress toward accessibility requirement compliance. By signing below, I acknowledge the importance of incorporating accessibility in course design.

Program Chair		
	Signature	Date

Curriculum Chair		
	Signature	Date

AVP		
	Signature	Date