

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): 10/15/2013; rev 12.5.13

Program Area: **Chemistry, 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

Chemistry, B.S. (120 units) Summary of Units Lower Division Requirements 28	Chemistry, B.S. (120 units) Summary of Units Lower Division Requirements 28	
---	---	--

Upper Division Requirements 22 Upper Division Chemistry Electives 20 Required Supporting, GE and Elective Courses 50 Total Units Required 120	Upper Division Requirements 22 Upper Division Chemistry Electives 20 Required Supporting, GE and Elective Courses 50 Total Units Required 120	
Lower Division Requirements - 28 units	Lower Division Requirements - 28 units	
<i>Students must obtain a grade of C or better in these courses to apply them to the chemistry major.</i>	<i>Students must obtain a grade of C or better in these courses to apply them to the chemistry major.</i>	
1. Chemistry	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	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. Math	2. Math	
MATH 150 - Calculus I Units: 4 MATH 151 - Calculus II Units: 4	MATH 150 - Calculus I Units: 4 MATH 151 - Calculus II Units: 4	
3. Physics	3. Physics	
Choose one of the following:	Choose one of the following:	
PHYS 100 - Introduction to Physics I Units: 4 PHYS 200 - General Physics I Units: 4	PHYS 100 - Introduction to Physics I Units: 4 PHYS 200 - General Physics I Units: 4	
Choose one of the following:	Choose one of the following:	

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

Upper Division Requirements - 22 units

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

- [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 373 - Physical Chemistry II](#) Units: 3
- [CHEM 460 - Biochemistry I](#) Units: 4
- [CHEM 499 - Chemistry Capstone](#) Units: 2

Note:

(Nine units of the above courses will be counted toward lower-division GE Categories B1, B3, and B4)

Upper Division Chemistry Electives - 20 units

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

Upper Division Requirements - 22 units

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

- [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 373 - Physical Chemistry II](#) Units: 3
- [CHEM 460 - Biochemistry I](#) Units: 3
- [CHEM 461 - Biochemistry Lab](#) Units: 1
- [CHEM 499 - Chemistry Capstone](#) Units: 2

Note:

(Nine units of the above courses will be counted toward lower-division GE Categories B1, B3, and B4)

Upper Division Chemistry Electives - 20 units

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

A total of 20 units of electives from those listed below are needed, including a minimum of three lab courses 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 ^I
- 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 344 - Energy and Society (Cross-listed as PHYS 344) Units: 3 ^I
- 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 461 - Biochemistry II 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

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

A total of 20 units of electives from those listed below are needed, including a minimum of three lab courses 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 ^I
- 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 344 - Energy and Society (Cross-listed as PHYS 344) Units: 3 ^I
- CHEM 345 – Science/Fiction 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 462 - Biochemistry II Units: 3
- CHEM^L 463 – Advanced Biochemistry Lab Units: 1 ^L
- CHEM 465 - Bioinorganic Chemistry Units: 4 ^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(s): ^I A maximum of 3 units of 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 -50 units <table><tr><td>American Institutions Requirement</td><td>6</td></tr><tr><td>Other Courses in GE Categories A-E</td><td>39</td></tr><tr><td>Electives in Any Discipline</td><td>5</td></tr></table>	American Institutions Requirement	6	Other Courses in GE Categories A-E	39	Electives in Any Discipline	5	• 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(s): ^I A maximum of 3 units of 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 -50 units <table><tr><td>American Institutions Requirement</td><td>6</td></tr><tr><td>Other Courses in GE Categories A-E</td><td>39</td></tr><tr><td>Electives in Any Discipline</td><td>5</td></tr></table>	American Institutions Requirement	6	Other Courses in GE Categories A-E	39	Electives in Any Discipline	5	
American Institutions Requirement	6													
Other Courses in GE Categories A-E	39													
Electives in Any Discipline	5													
American Institutions Requirement	6													
Other Courses in GE Categories A-E	39													
Electives in Any Discipline	5													

Proposer of Program Modification

Date

APPROVAL SHEET

Program: CHEMISTRY

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