California State University Channel Islands

Program Modification

Program modifications must be submitted by November 2, 2009 for priority catalog review

Date (Change if modified and update the file name with the new date): 5.15.09, catalog copy; rev 11.17.09

Program Area: CHEMISTRY

Semester /Year First affected: FALL 2010

Instructions: Please use this <u>Program Modification</u> 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 <u>Program Update</u> 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.

CURRENTLY APPROVED PROGRAM

PROPOSED PROGRAM

Chemistry

Programs Offered

- Bachelor of Arts in Chemistry
- Bachelor of Arts in Chemistry, Option in Subject Matter Preparation in Teaching Chemistry
 - (Pending CCTC approval)
- Bachelor of Science in Chemistry
- Bachelor of Science in Chemistry, Option in Biochemistry
- Minor in Chemistry
- Certificate in Chemistry

The Chemistry Program at CSUCI is based on a "Big Ideas" approach to the discipline. Students will learn how to apply the "Big Ideas" skills to their analysis of concepts and problems. In addition to implementing the "Big Ideas" across the curriculum, students learn how to improve their analytical thinking, oral and written communication, and problem solving skills as individuals and in teams. The culmination of the degree involves a Chemistry Capstone in conjunction with a service learning project, internship, or independent research experience. Writing skills are developed in all upper-division Chemistry courses.

Chemistry

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Careers

Graduates from the Bachelor of Arts or Bachelor of Science in Chemistry will receive an excellent preparation for securing entrance to a professional program (i.e., medical, veterinary, dentistry, or pharmacy), to graduate school in Chemistry or Biochemistry, and for employment in the academic, private, or public sector as chemists, biochemists, forensic scientists, and materials scientists.

The Bachelor of Arts in Chemistry is designed to provide a broad preparation in the chemical sciences. Required courses prepare students in four of the five traditional sub-disciplines of Chemistry: analytical, inorganic, organic, and physical chemistry. The Bachelor of Arts in Chemistry can also serve as the depth of study necessary for securing a Single Subject Credential in Science for teaching at the high school and middle school level. Additional courses in geology, astronomy, and biology are recommended to meet the breadth requirements for this credential.

The Bachelor of Science in Chemistry provides an excellent breadth and depth of preparation in Chemistry suitable for obtaining a position at a chemical or pharmaceutical industry, or for admission to graduate school in Chemistry or Biochemistry. Students may select either the general Bachelor of Science in Chemistry or the Biochemistry Option within the Bachelor of Science in Chemistry. The Biochemistry Option overlaps substantially with the requirements for the minor in Biology and students are encouraged to obtain the Biology minor in addition to the Bachelor of Science in Chemistry, Biochemistry Option.

The Minor in Chemistry provides non-majors with the Chemistry background that is needed to pursue graduate study or a career in an interdisciplinary field. Students in professional programs (medical, dental, veterinary, pharmacy), or majoring in Biology or Environmental Science and Resource Management, in particular, should consider obtaining a Chemistry minor, since a significant portion of the coursework needed for the Chemistry minor is included in these programs.

The Certificate in Chemistry is designed to provide individuals who have already obtained a Bachelor of Arts or Bachelor of Science degree in another discipline with the opportunity to obtain a certificate for advanced Chemistry coursework.

Program Learning Outcomes

Students graduating from the Chemistry program will be able to:

- Explain the fundamental concepts of Chemistry;
- Evaluate a problem and appropriately apply the fundamental concepts of Chemistry to the problem;
- Formulate hypotheses and devise and perform experiments to test a hypothesis as

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Students graduating from the Chemistry program will be able to:

- Explain the fundamental concepts of Chemistry;
- Evaluate a problem and appropriately apply the fundamental concepts of Chemistry to the problem;
- Formulate hypotheses and devise and perform experiments to test a hypothesis as

individuals and in a team;

- Explain key concepts in chemistry effectively through oral and written communication;
 and
- Interpret and evaluate the chemical literature.

Contact Information

http://chemistry.csuci.edu

Faculty

Simone Aloisio, Ph.D.

Associate Professor of Chemistry

Chair and Academic Advisor for the Chemistry Program

Aliso Hall Room 207 Phone: (805) 437-8999 simone.aloisio@csuci.edu

Blake Gillespie, Ph.D.

Assistant Professor of Chemistry

Academic Advisor for the Chemistry Program

Aliso Hall Room 208 Phone: (805) 437-2796 blake.gillespie@csuci.edu

Philip D. Hampton, Ph.D.

Professor of Chemistry

Academic Advisor for the Chemistry Program

Aliso Hall Room 104 Phone: (805) 437-8869 philip.hampton@csuci.edu

Bachelor of Arts Degree in Chemistry - (120 units)

Lower Division Requirements - 28 units

1. Chemistry

CHEM 121 General Chemistry I4

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Lower Division Requirements - 28 units

Students must obtain a grade of C or better in these courses to

CHEM 122	General Chemistry II4	apply them to	the chemistry major.
CHEM 250	Quantitative Analysis2	1. Chemistry	<u> </u>
CHEM 251	Quantitative Analysis Laboratory 2	CHEM 121	General Chemistry I4
		CHEM 122	General Chemistry II4
2. Math		CHEM 250	Quantitative Analysis3
MATH 150	Calculus I4	CHEM 251	Quantitative Analysis Laboratory
MATH 151	Calculus II4	G12.11 201	Quantum -
		2. Math	
3. Physics		MATH 150	Calculus I4
Choose one of the	following:	MATH 151	Calculus II4
PHYS 100	Introduction to Physics I4	1121212 101	
PHYS 200	General Physics I4	3. Physics	
		Choose one of the	following:
Choose one of the	following:	PHYS 100	Introduction to Physics I4
PHYS 101	Introduction to Physics II4	PHYS 200	General Physics I4
PHYS 201	General Physics II4	200	3010141 1 hystes 1
		Choose one of the	following:
Upper Division	on Requirements - 15 units	PHYS 101	Introduction to Physics II4
CHEM 305	Computer Applications in Chemistry1	PHYS 201	General Physics II4
CHEM 311	Organic Chemistry I3		- · · · · · · · · · · · · · · · · · · ·
CHEM 312	Organic Chemistry I Laboratory1	Upper Divisio	on Requirements - 15 units
CHEM 314	Organic Chemistry II3		
CHEM 315	Organic Chemistry II Laboratory1		t obtain a grade of C or better in these courses to
CHEM 371	Physical Chemistry I3	apply them to	the chemistry major.
CHEM 372	Physical Chemistry Laboratory1	CHEM 305	Computer Applications in Chemistry 1
CHEM 499	Chemistry Capstone2	CHEM 311	Organic Chemistry I
		CHEM 312	Organic Chemistry I Laboratory1
(Ten units of the a	bove courses will be counted toward lower-division GE categories	CHEM 314	Organic Chemistry II3
B1, B3, and B4)		CHEM 315	Organic Chemistry II Laboratory1
		CHEM 371	Physical Chemistry I3
Upper Divisio	on Chemistry Electives	CHEM 372	Physical Chemistry Laboratory1
12 units	in chemistry zhourves	CHEM 499	Chemistry Capstone2
A total of twelve units of electives from those listed below are needed, including a minimum		(Ten units of the above courses will be counted toward lower-division GE categories	
of two lab courses of	lenoted- ":	B1, B3, and B4)	
CHEM 201			
CHEM 301	Environmental Chemistry - Atmosphere	Upper Division	on Chemistry Electives
CHEM 202	and Climate3	12 units	•
CHEM 302	Environmental Chemistry - Soil		1
	and Water4 L	A total of twe	lve units of electives from those listed below are

CHEN 4	212				
CHEM	313	Organic Chemistry I Learning			ling a minimum of two lab courses denoted- L:
CITED (21.5	Community1	Students 1	nust	obtain a grade of C or better in these courses to
CHEM	316	Organic Chemistry II Learning			the chemistry major.
CHEN	220	Community1	apply their	11 10	the enemistry major.
CHEM	330	The History of Science: Non-Western			
		Origins and the Western	CHEM 2	Ω1	Euripe and Chamister Atmosphere
		Revolution (HIST)3 ¹	CHEM 3	01	Environmental Chemistry - Atmosphere
CHEM		The Chemistry of the Kitchen3 ¹	CHENA 2	.02	and Climate3
CHEM		Drug Discovery and Development	CHEM 3	02	Environmental Chemistry - Soil
		ECON)3 ¹			and Water4 L
CHEM	-	Forensic Science	CHEM 3	13	Organic Chemistry I Learning
	344	Energy and Society3 ^I			Community
CHEM	373	Physical Chemistry II3	CHEM 3	16	Organic Chemistry II Learning
CHEM	410	Advanced Organic Synthesis4 L			Community 1
CHEM	415	Molecular Structure Determination4 ^L	CHEM 3	30	The History of Science: Non-Western
CHEM	420	Advanced Inorganic Chemistry3			Origins and the Western
CHEM	450	Instrumental Analysis and Laboratory4 ^L			Revolution (HIST) 3 ¹
CHEM	460	Biochemistry I4 ^L	CHEM 3	35	The Chemistry of the Kitchen 3 ^I
CHEM		Biochemistry II4 L	CHEM 3	41	Drug Discovery and Development
CHEM		Bioinorganic Chemistry4 L	()	BUS/E	ECON)3 ^I
CHEM	490	Special Topics in Chemistry1-3	CHEM 3		Forensic Science
CHEM		Internship/ Service Learning1-3 L, R	CHEM 3	44	Energy and Society (PHYS)3 ^I
	494	Independent Research1-3 L, R	CHEM 3		Physical Chemistry II3
CHEM		Directed Studies1-3 R	CHEM 4		Advanced Organic Synthesis4 ^L
CIILM	177	Directed Studies	CHEM 4		Molecular Structure Determination4 ^L
I A maximu	m of thr	ee units of upper-division interdisciplinary GE credit (CHEM 330-349 or	CHEM 4	-	Advanced Inorganic Chemistry3
		ay be applied as chemistry electives towards the degree.	CHEM 4		Instrumental Analysis and Laboratory 4 ^L
CHEWI 450	- -/) III	ay be applied as elicinistry electives towards the degree.	CHEM 4		Biochemistry I4 L
R No more t	hon o oc	ombined total of six units of CHEM 492, 494, and 497 may be applied as	CHEM 4		Biochemistry II4 L
		than one CHEM 492 or CHEM 494 may be (by petition) considered a	CHEM 4		Bioinorganic Chemistry4 L
		man one CHEM 492 of CHEM 494 may be (by pennion) considered a	CHEM 4		Special Topics in Chemistry1-3
laboratory e	iecuve.		CHEM 49		Special Laboratory Topics in Chemistry 1-3 L
D : 1	a	d 104 CF C	CHEM 49		Internship/ Service Learning 1-3 L.R
Required Supporting and Other GE Courses				Independent Research	
45 units		CHEM 4		Directed Studies	
American Institutions Requirement		CHEM 4	.97	Directed Studies1-3	
Other Courses in GE Categories A-E39		Ι	6.4	** C	
Electives in Any Discipline20		¹ A maximum of three units of upper-division interdisciplinary GE credit (CHEM 330-349 or			
		CHEM 430-4	149) m	ay be applied as chemistry electives towards the degree.	
Proposed Course of Study,		Rar			
Troposed Course of Study,		^R No more than a combined total of <u>six</u> units of CHEM 492, 494, and 497 may be applied as			

Bachelor of Arts in Chemistry	electives. No more than one of CHEM 492 or CHEM 494 may be (by petition) considered a	
	laboratory elective.	
First Year		
Fall	Required Supporting and Other GE Courses	
CHEM 121 General Chemistry I4	45 units	
GE B1	American Institutions Requirement 6	
MATH 150 Calculus I4	Other Courses in GE Categories A-E	
GE B3	Electives in Any Discipline	
General Education 6-7		
	Proposed Course of Study,	
Spring	Bachelor of Arts in Chemistry	
CHEM 122 General Chemistry II4	Bucheror of Arts in Chemistry	
MATH 151 Calculus II4	First Year	
General Education6-7	Fall	
	CHEM 121 General Chemistry I	
Second Year	GE B1	
Fall CHEM 211 Organia Chamistry I	MATH 150 Calculus I4	
CHEM 311 Organic Chemistry I3 CHEM 312 Organic Chemistry I Laboratory1	GE B3	
Physics requirement4	General Education6-7	
(PHYS 100 or 200)		
General Education	Spring	
General Education0-7	CHEM 122 General Chemistry II4	
Spring	MATH 151 Calculus II4	
CHEM 250 Quantitative Analysis2	General Education6-7	
CHEM 251 Quantitative Analysis Laboratory2		
CHEM 314 Organic Chemistry II3	Second Year	
CHEM 315 Organic Chemistry II Laboratory1	Fall	
Physics requirement4	CHEM 311 Organic Chemistry I3	
(PHYS 101 or 201)	CHEM 312 Organic Chemistry I Laboratory1	
General Education3	Physics requirement	
	(PHYS 100 or 200)	
Third Year	General Education6-7	
Fall		
CHEM 305 Computer Applications in Chemistry1	Spring CHENA 250 Continue And I in	
GE B4	CHEM 250 Quantitative Analysis	
CHEM 371 Physical Chemistry I3	CHEM 251 Quantitative Analysis Laboratory	
CHEM 372 Physical Chemistry Laboratory1	CHEM 314 Organic Chemistry II	
Chemistry Elective	CHEM 315 Organic Chemistry II Laboratory	
General Education and Electives	Physics requirement4	

	(PHYS 101 or 201)
Spring	General Education3
Chemistry Elective4	
General Education and Electives12	Third Year
	Fall
Fourth Year	CHEM 305 Computer Applications in Chemistry 1
Fall	GE B4
Chemistry Elective or Independent Research 3-4	CHEM 371 Physical Chemistry I3
General Education and Electives12	CHEM 372 Physical Chemistry Laboratory 1
	Chemistry Elective3-4
Spring	General Education and Electives6-7
CHEM 499 Chemistry Capstone2	
Chemistry Elective or Independent Research 3-4	Spring
General Education and Electives9	Chemistry Elective
	General Education and Electives
Bachelor of Arts Degree in Chemistry, Option in Subject Matter Preparation in Teaching Chemistry - (120 units) (Pending CCTC Approval)	Fourth Year Fall Chemistry Elective or Independent Research
Lower Division Requirements	
43 - 44 units	
1. Chemistry	Bachelor of Arts Degree in Chemistry,
CHEM 121 General Chemistry I4	Option in Subject Matter Preparation in
CHEM 122 General Chemistry II4	Teaching Chemistry - (120 units)
CHEM 250 Quantitative Analysis2	
CHEM 251 Quantitative Analysis Laboratory2	
2. Biology	
BIOL 200 Principles of Organismal and	
Population Biology4	Lower Division Requirements
BIOL 201 Principles of Cell and Molecular	
Biology4	Students must obtain a grade of C or better in these courses to

3. Math		apply them to the chemistry major.
MATH 150	Calculus I4	
MATH 151	Calculus II4	43 - 44 units
4. Physics		1. Chemistry
Choose <u>one</u> of the j	following:	CHEM 121 General Chemistry I4
PHYS 100	Introduction to Physics I4	CHEM 122 General Chemistry II4
PHYS 200	General Physics I4	CHEM 250 Quantitative Analysis3
	•	CHEM 251 Quantitative Analysis Laboratory 1
Choose one of the	following:	
PHYS 101	Introduction to Physics II4	2. Biology
PHYS 201	General Physics II4	BIOL 200 Principles of Organismal and
		Population Biology4
5. Astronomy		BIOL 201 Principles of Cell and Molecular
Choose <u>one</u> of the j		Biology4
ASTR 105	Introduction to the Solar System (PHYS)4	3. Math
PHYS 107	The Stars and Beyond3	MATH 150 Calculus I4
6 F. 1 G I		MATH 151 Calculus II
6. Earth Science	N : 10 1	A Division
GEOL 121	Physical Geology4	4. Physics Choose one of the following:
Han an Divisia	a De guinements	PHYS 100 Introduction to Physics I4
	on Requirements	PHYS 200 General Physics I4
24 - 25 units		Title 200 Statut Hysico I illinininininininininininininininininin
1. Chemistry		Choose one of the following:
CHEM 305	Computer Applications in Chemistry1	PHYS 101 Introduction to Physics II4
CHEM 311	Organic Chemistry I3	PHYS 201 General Physics II4
CHEM 312	Organic Chemistry I Laboratory1	
CHEM 314	Organic Chemistry II3	5. Astronomy
CHEM 315 CHEM 330	Organic Chemistry II Laboratory	Choose <u>one</u> of the following:
CHEM 330	The History of Science: Non-Western Origins and the Western Revolution	ASTR 105 Introduction to the Solar System (PHYS)4
	(HIST)	PHYS 107 The Stars and Beyond3
CHEM 371	Physical Chemistry I3	
CHEM 372	Physical Chemistry Laboratory1	6. Earth Science GEOL 121 Physical Geology4
CHEM 499	Chemistry Capstone2	GEOL 121 Physical Geology4
		Upper Division Requirements
2. Earth Science		
Choose one of the following:		24 - 25 units
BIOL 335	The Biosphere3	Students must obtain a grade of C or better in these courses to
GEOL 300	Foundations of Earth Science4	

	apply them to the chemistry major.
3. Education	1. Chemistry
EDUC 330 Introduction to Secondary Schooling3	CHEM 305 Computer Applications in Chemistry 1
<i>g</i>	CHEM 311 Organic Chemistry I
Upper Division Chemistry Electives	
	CHEM 312 Organic Chemistry I Laboratory
8 units	CHEM 314 Organic Chemistry II
A total of eight units of electives from those listed below are needed, lab courses are	CHEM 315 Organic Chemistry II Laboratory
denoted ^L .	CHEM 330 The History of Science: Non-Western
	Origins and the Western Revolution
CHEM 301 Environmental Chemistry -	(HIST)
Atmosphere and Climate3	CHEM 371 Physical Chemistry I
CHEM 302 Environmental Chemistry -	CHEM 372 Physical Chemistry Laboratory
Soil and Water4 ^L	CHEM 499 Chemistry Capstone2
CHEM 313 Organic Chemistry I Learning	
Community1	2. Earth Science
CHEM 316 Organic Chemistry II Learning	Choose one of the following:
Community1	BIOL 335 The Biosphere3
CHEM 373 Physical Chemistry II3	GEOL 300 Foundations of Earth Science4
CHEM 410 Advanced Organic Synthesis4 L	
CHEM 415 Molecular Structure Determination 4 L	3. Education
CHEM 420 Advanced Inorganic Chemistry3	EDUC 330 Introduction to Secondary Schooling3
CHEM 450 Instrumental Analysis and Laboratory 4 L	
CHEM 460 Biochemistry I4 L	Upper Division Chemistry Electives
CHEM 461 Biochemistry II4 ^L	8 units
CHEM 465 Bioinorganic Chemistry4 L	
CHEM 490 Special Topics in Chemistry1-3	A total of eight units of electives from those listed below are needed, lab courses are
CHEM 492 Internship/ Service Learning1-3 L, R	denoted ^L . Students must obtain a grade of C or better in these
CHEM 494 Independent Research1-3 L, R	courses to apply them to the chemistry major.
CHEM 497 Directed Studies1-3 R	
^R No more than a combined total of six units of CHEM 492, 494, and 497 may be applied as	CHEM 301 Environmental Chemistry -
electives. No more than one CHEM 492 or CHEM 494 may be (by petition) considered a	Atmosphere and Climate3
laboratory elective.	CHEM 302 Environmental Chemistry -
	Soil and Water4 ^L
Required Supporting and Other GE Courses	CHEM 313 Organic Chemistry I Learning
39 units	Community
American Institutions Requirement6	CHEM 316 Organic Chemistry II Learning
Other Courses in GE Categories A-E33	Community
	CHEM 373 Physical Chemistry II3
Electives in Any Discipline	- Hysten Chemistry 12 minimum

	CHEM 410 Advanced Organic Synthesis		
Recommended Electives	CHEM 415 Molecular Structure Determination4 L		
Choose from the following:	CHEM 420 Advanced Inorganic Chemistry 3		
	CHEM 450 Instrumental Analysis and Laboratory4 L		
Second Language	CHEM 460 Biochemistry I4 ^L		
(One semester is required)	CHEM 461 Biochemistry II4 ^L		
One Additional Semester of a Second Language3	CHEM 465 Bioinorganic Chemistry4 L		
66	CHEM 490 Special Topics in Chemistry1-3		
Interdisciplinary General Education Courses	CHEM 491 Special Laboratory Topics in Chemistry 1-3 L		
(CHEM 330 and EDUC 330 are required)	CHEM 492 Internship/ Service Learning 1-3 L, R		
SPED 345 Individuals with Disabilities	CHEM 494 Independent Research 1-3 L, R		
in Society (PSY)3	CHEM 497 Directed Studies1-3 R		
	D.		
Prerequisite Courses in Education	^R No more than a combined total of six units of CHEM 492, 494, and 497 may be applied as		
(For CSUCI Credential Program)	electives. No more than one of CHEM 492 or CHEM 494 may be (by petition) considered a		
EDUC 512 Equity, Diversity and Foundations	laboratory elective.		
of Schooling3			
EDUC 520 Observing and Guiding Behavior in	Required Supporting and Other GE Courses		
Multicultural/Multilingual and Inclusive	39 units		
Classrooms3	American Institutions Requirement6		
EDUC 521 Field Experiences1	Other Courses in GE Categories A-E33		
EDSS 515 Adolescent Development for	Electives in Any Discipline4-6		
Secondary Educators3			
ENGL 475 Language in Social Context3	Recommended Electives		
	Choose from the following:		
Proposed Course of Study, Bachelor of Arts in Chemistry Option			
in Subject Matter Preparation in Teaching Chemistry	Second Language		
in Subject Matter Freparation in Teaching Chemistry	(One semester is required)		
First Year	One Additional Semester of a Second Language		
First Year Fall			
CHEM 121 General Chemistry I4	Interdisciplinary General Education Courses		
GE B1	(CHEM 330 and EDUC 330 are required)		
MATH 150 Calculus I4	SPED 345 Individuals with Disabilities		
GE B3	in Society (PSY)3		
BIOL 200 Principles of Organismal &			
Population Biology4	According to the GE requirements, students must take nine units from those		
GE B2	interdisciplinary courses numbered 330-349 and 430-449. Six of the nine units can be double		
General Education	counted and three of the nine units must be outside the major and not crosslisted with the		
General Ladeatton	CHEM prefix.		
	I		

Spring	
CHEM 122 General Chemistry II4	Prerequisite Courses in Education
BIOL 201 Principles of Cell & Molecular Biology 4	(For CSUCI Credential Program)
MATH 151 Calculus II4	EDUC 512 Equity, Diversity and Foundations
General Education3	of Schooling3
	EDUC 520 Observing and Guiding Behavior in
Second Year	Multicultural/Multilingual and Inclusive
Fall	Classrooms 3
CHEM 311 Organic Chemistry I3	EDUC 521 Field Experiences
CHEM 312 Organic Chemistry I Laboratory1	EDSS 515 Adolescent Development for
Physics requirement4	Secondary Educators3
(PHYS 100 or 200)	ENGL 475 Language in Social Context
General Education	
	Proposed Course of Study, Bachelor of Arts in Chemistry Option
Spring CHEM 250 Overtitative Analysis	in Subject Matter Preparation in Teaching Chemistry
CHEM 250 Quantitative Analysis	in a wejoot is amount in population in powering enormality
CHEM 251 Quantitative Analysis Laboratory2 CHEM 314 Organic Chemistry II	First Year
•	Fall
CHEM 315 Organic Chemistry II Laboratory	CHEM 121 General Chemistry I4
Physics requirement	GE B1
(PHYS 101 or 201)	MATH 150 Calculus I
General Education	GE B3
Third Year	BIOL 200 Principles of Organismal &
Fall	Population Biology4
	GE B2
CHEM 305 Computer Applications in Chemistry1 GE B4	General Education
CHEM 371 Physical Chemistry I3	
CHEM 372 Physical Chemistry Laboratory1	Spring
EDUC 330 Introduction to Secondary Schooling3	CHEM 122 General Chemistry II4
GE D, INTD	BIOL 201 Principles of Cell & Molecular Biology 4
GEOL 121 Physical Geology4	MATH 151 Calculus II4
General Educationand Electives	General Education
General Educationalid Electives	
Spring	Second Year
CHEM 330 The History of Science: Non-Western	Fall
Origins and the Western	CHEM 311 Organic Chemistry I3
Revolution (HIST)3;	CHEM 312 Organic Chemistry I Laboratory1
INTD	Physics requirement4
SPED 345 Individuals with Disabilities	(PHYS 100 or 200)

in Society (PSY)3;	General Education6-7		
GE D or E, INTD			
General Education and Electives6	Spring		
	CHEM 250 Quantitative Analysis3		
Choose <u>one</u> of the following:	CHEM 251 Quantitative Analysis Laboratory		
BIOL 335 The Biosphere3	CHEM 314 Organic Chemistry II3		
GEOL 300 Foundations of Earth Science4	CHEM 315 Organic Chemistry II Laboratory1		
	Physics requirement4		
Fourth Year	(PHYS 101 or 201)		
Fall	General Education		
Chemistry Elective or Independent Research 3-4			
General Education and Electives	Third Year		
200000000000000000000000000000000000000	Fall		
Spring	CHEM 305 Computer Applications in Chemistry 1		
CHEM 499 Chemistry Capstone2	GE B4		
Chemistry Elective or Independent Research	CHEM 371 Physical Chemistry I		
General Education and Electives9	CHEM 372 Physical Chemistry Laboratory		
Contrat Education and Electrics	EDUC 330 Introduction to Secondary Schooling 3		
	GE D, INTD		
	GEOL 121 Physical Geology4		
Bachelor of Science Degree in Chemistry -	General Education and Electives		
, ,	General Educationalid Electives		
(120 units)	Spring		
	CHEM 330 The History of Science: Non-Western		
	Origins and the Western		
Lower Division	Revolution (HIST)3;		
Requirements - 28 Units	INTD		
1. Chemistry			
CHEM 121 General Chemistry I4	SPED 345 Individuals with Disabilities		
CHEM 122 General Chemistry II4	in Society (PSY)3;		
CHEM 250 Quantitative Analysis	GE D or E, INTD		
CHEM 251 Quantitative Analysis Laboratory2	General Education and Electives6		
CHEAVI 251 Qualificative Analysis Edooratory2			
2. Math	Choose one of the following:		
MATH 150 Calculus I4	BIOL 335 The Biosphere		
	GEOL 300 Foundations of Earth Science4		
MATH 151 Calculus II4	The state of the s		
2 Physics	Fourth Year		
3. Physics Change are of the following.	Fall		
Choose one of the following:	Chemistry Elective or Independent Research		
PHYS 100 Introduction to Physics I4	General Education and Electives		

PHYS	200	General Physics I4	Spring	
Choose one	e of the	following:	Spring CHEM 499 Chemistry Capstone	
PHYS		Introduction to Physics II4	Chemistry Elective or Independent Research	
PHYS	201	General Physics II4	General Education and Electives	
Linnar F	Nivicio	on Paguiramanta 22 unita	7	
		on Requirements - 22 units		
CHEM		Computer Applications in Chemistry1	Bachelor of Science Degree in Chemistry -	
CHEM		Organic Chemistry I	•	
CHEM		Organic Chemistry I Laboratory1	(120 units)	
CHEM CHEM		Organic Chemistry II		
CHEM		Organic Chemistry II Laboratory1 Physical Chemistry I3		Lower Division
CHEM		Physical Chemistry Laboratory1	D	Lower Division
CHEM		Physical Chemistry II	Requirements - 28 Units	
CHEM		Biochemistry I4	Students must obtain a grade of C or better in the	se courses to
CHEM		Chemistry Capstone2	apply them to the chemistry major.	
			apply them to the enemal major.	
(Nine units	of the a	bove courses will be counted toward lower-division GE Categories B1,	1.01	
B3, and B4	-		1. Chemistry CHEM 121 Congred Chamistry I	
	,		CHEM 121 General Chemistry I 4 CHEM 122 General Chemistry II 4	
Upper D)ivisio	on Chemistry Electives	CHEM 250 Quantitative Analysis	
20 units	111510	in chombay Ziecu ves	CHEM 251 Quantitative Analysis Laboratory	
20 units			CHEW 251 Qualitiative Analysis Education	
A total of to	wontv บร	nits of electives from those listed below are needed, including a	2. Math	
minimum o			MATH 150 Calculus I4	
denoted ^L :	, inice i	wo courses	MATH 151 Calculus II4	
CHEM	301	Environmental Chemistry -	3. Physics	
		Atmosphere and Climate3	Choose <u>one</u> of the following:	
CHEM	302	Environmental Chemistry -	PHYS 100 Introduction to Physics I4	
		Soil and Water4	PHYS 200 General Physics I4	
CHEM	313	Organic Chemistry I Learning		
		Community1	Choose <u>one</u> of the following:	
CHEM	316	Organic Chemistry II Learning	PHYS 101 Introduction to Physics II4	
		Community1	PHYS 201 General Physics II4	
CHEM	330	The History of Science: Non-Western		
		Origins and the Western Revolution	Upper Division Requirements - 22 units	
		(HIST)3 ¹	Students must obtain a grade of C or better in the	se courses to

CHEM 335 The Chemistry of the Kitchen 3 L, I	apply them to the chemistry major.	
CHEM 341 Drug Discovery and Development	apply them to the enemistry major.	
(BUS/ECON)3 ¹		
CHEM 343 Forensic Science3 ^{L,I}	CHEM 305 Computer Applications in Chemistry 1	
CHEM 344 Energy and Society3 ^I	CHEM 311 Organic Chemistry I3	
CHEM 410 Advanced Organic Synthesis	CHEM 312 Organic Chemistry I Laboratory 1	
CHEM 415 Molecular Structure Determination 4 L	CHEM 314 Organic Chemistry II3	
CHEM 420 Advanced Inorganic Chemistry	CHEM 315 Organic Chemistry II Laboratory1	
CHEM 450 Instrumental Analysis and Laboratory 4 L	CHEM 371 Physical Chemistry I3	
CHEM 461 Biochemistry II4 ^L	CHEM 372 Physical Chemistry Laboratory1	
CHEM 465 Bioinorganic Chemistry	CHEM 373 Physical Chemistry II3	
CHEM 490 Special Topics in Chemistry1-3	CHEM 460 Biochemistry I4	
CHEM 492 Internship/ Service Learning1-3 L, R	CHEM 499 Chemistry Capstone2	
CHEM 494 Independent Research		
CHEM 497 Directed Studies1-3 R	(Nine units of the above courses will be counted toward lower-division GE Categories B1,	
CHEMI 477 Directed Studies	B3, and B4)	
¹ A maximum of three units of upper-division interdisciplinary GE credit (CHEM 330-349 or		
CHEM 430-449) may be applied as chemistry electives towards the degree.	Upper Division Chemistry Electives	
critish 150 117) may be applied as chemistry electives to wards the degree.	20 units	
^R No more than a combined total of six units of CHEM 492, 494, and 497 may be	_ v - vv-	
applied as electives. No more than	Students must obtain a grade of C or better in these courses to	
one CHEM 492 or CHEM 494 may be (by petition) considered a laboratory elective.	apply them to the chemistry major.	
., ., ., ., ., ., ., ., ., ., ., ., ., .		
Required Supporting and Other GE Courses	A total of <u>twenty</u> units of electives from those listed below are needed, including a	
45 units	minimum of three lab courses	
American Institutions Requirement	denoted ^L :	
Other Courses in GE Categories A-E39		
Electives in Any Discipline	CHEM 301 Environmental Chemistry -	
Licetives in Any Discipline	Atmosphere and Climate3	
Draw and Course of Study	CHEM 302 Environmental Chemistry -	
Proposed Course of Study	Soil and Water4 ^L	
Bachelor of Science in Chemistry	CHEM 313 Organic Chemistry I Learning	
	Community1	
First Year	CHEM 316 Organic Chemistry II Learning	
Fall	Community1	
CHEM 121 General Chemistry I4	CHEM 330 The History of Science: Non-Western	
GE B1	Origins and the Western Revolution	
MATH 150 Calculus I4	(HIST)	
GE B3	CHEM 335 The Chemistry of the Kitchen3 L, I	
General Education	CHEM 341 Drug Discovery and Development	

	(BUS/ECON) 3 ¹
Spring	CHEM 343 Forensic Science3 ^{L, I}
CHEM 122 General Chemistry II4	CHEM 344 Energy and Society (PHYS)
MATH 151 Calculus II4	CHEM 410 Advanced Organic Synthesis4 ^L
General Education 6-7	CHEM 415 Molecular Structure Determination4 L
	CHEM 420 Advanced Inorganic Chemistry
Second Year	CHEM 450 Instrumental Analysis and Laboratory4 L
Fall	CHEM 461 Biochemistry II4 ^L
CHEM 311 Organic Chemistry I3	CHEM 465 Bioinorganic Chemistry4 L
CHEM 312 Organic Chemistry I Laboratory1	CHEM 490 Special Topics in Chemistry1-3
Physics requirement4	CHEM 491 Special Laboratory Topics in Chemistry 1-3 L
(PHYS 100 or 200)	CHEM 492 Internship/ Service Learning 1-3 L, R
General Education6-7	CHEM 494 Independent Research 1-3 L, R
	CHEM 497 Directed Studies1-3 R
Spring	
CHEM 250 Quantitative Analysis2	¹ A maximum of three units of upper-division interdisciplinary GE credit (CHEM 330-349 or
CHEM 251 Quantitative Analysis Laboratory2	CHEM 430-449) may be applied as chemistry electives towards the degree.
CHEM 314 Organic Chemistry II3	
CHEM 315 Organic Chemistry II Laboratory1	^R No more than a combined total of six units of CHEM 492, 494, and 497 may be applied as
Physics requirement4	electives. No more than one of CHEM 492 or CHEM 494 may be (by petition) considered a
(PHYS 101 or 201)	laboratory elective.
General Education3	
	Required Supporting and Other GE Courses
Third Year	45 units
Fall	American Institutions Requirement
CHEM 305 Computer Applications in Chemistry1	Other Courses in GE Categories A-E
GE B4	Electives in Any Discipline
CHEM 371 Physical Chemistry I3	Liceuves in rany Discipline
CHEM 372 Physical Chemistry Laboratory1	Dranged Course of Study
Chemistry Elective	Proposed Course of Study
General Education and Electives6	Bachelor of Science in Chemistry
Spring	First Year
CHEM 373 Physical Chemistry II3	Fall
Chemistry Elective	CHEM 121 General Chemistry I4
General Education and Electives6	GE B1
	MATH 150 Calculus I4
Fourth Year	GE B3
Fall	General Education6-7
CHEM 460 Biochemistry I4	

Chemistry Elective or Independent Research 3-4	Spring		
General Education and Electives6-7	CHEM 122 General Chemistry II4		
	MATH 151 Calculus II4		
Spring	General Education6-7		
CHEM 499 Chemistry Capstone2			
Chemistry Elective	Second Year		
Chemistry Elective or Independent Research 3-4	Fall		
General Education and Electives6	CHEM 311 Organic Chemistry I3		
	CHEM 312 Organic Chemistry I Laboratory 1		
	Physics requirement4		
	(PHYS 100 or 200)		
Bachelor of Science Degree	General Education6-7		
in Chemistry, Biochemistry Option			
T T T T T T T T T T T T T T T T T T T	Spring		
(120 units)	CHEM 250 Quantitative Analysis		
	CHEM 251 Quantitative Analysis Laboratory 1		
	CHEM 314 Organic Chemistry II3		
Lower Division Requirements - 36 units	CHEM 315 Organic Chemistry II Laboratory 1		
	Physics requirement4		
1. Chemistry	(PHYS 101 or 201)		
CHEM 121 General Chemistry I4	General Education		
CHEM 122 General Chemistry II4			
CHEM 250 Quantitative Analysis2	Third Year		
CHEM 251 Quantitative Analysis Laboratory2	Fall		
2 Pt L	CHEM 305 Computer Applications in Chemistry 1		
2. Biology PHOL 200 Principles of Organismal and	GE B4		
BIOL 200 Principles of Organismal and	CHEM 371 Physical Chemistry I		
Population Biology4	CHEM 372 Physical Chemistry Laboratory 1		
BIOL 201 Principles of Cell & Molecular Biology4	Chemistry Elective3-4		
2 M-4l	General Education and Electives6		
3. Math			
MATH 150 Calculus I	Spring CHEN 272 Pile in Chen in the		
MATH 151 Calculus II4	CHEM 373 Physical Chemistry II		
A Division	Chemistry Elective3-4		
4. Physics Change are of the fellowing.	General Education and Electives6		
Choose one of the following: PLIVS 100 Introduction to Physics I	Fd. V		
PHYS 100 Introduction to Physics I	Fourth Year		
PHYS 200 General Physics I4	Fall		
Channel of the fall of the single	CHEM 460 Biochemistry I		
Choose <u>one</u> of the following:	Chemistry Elective or Independent Research3-4		

PHYS 201 General Physics II	
CHEM 499 Chemistry Capstone	
Upper Division Requirements - 31 units Chemistry Elective	
1. Chemistry Elective or Independent Research	
CHEM 305 Computer Applications in Chemistry1 General Education and Electives	
CHEW 505 Computer Applications in Chemistry	
CHEM 312 Organic Chemistry I Laboratory	
CHEM 315 Organic Chemistry II Laboratory	
CHEM 371 Physical Chemistry I	
CHEM 372 Physical Chemistry Laboratory	
CHEW 400 Blochemsty 14	
CHEM 461 Biochemistry II	
CHEM 499 Chemistry Capstone2	
Lower Division Requirements - 36 units	
2. Biology	to
	.0
BIOL 400 Molecular Biology4 apply them to the chemistry major.	
(Twelve units of the above requirements will be counted toward lower-division GE 1. Chemistry	
Categories B1, B2, B3, & B4) CHEM 121 General Chemistry I	
CHEM 122 General Chemistry II	
Upper Division Chemistry Electives CHEM 250 Quantitative Analysis	
3 units CHEM 251 Quantitative Analysis Laboratory	
A total of three units of electives from those listed below are needed. Lab courses are	
denoted ^L . 2. Biology	
BIOL 200 Principles of Organismal and	
CHEM 301 Environmental Chemistry - Population Biology	
Atmosphere and Climate	
CHEM 302 Environmental Chemistry -	
Soil and Water4 3. Math	
CHEM 313 Organic Chemistry I Learning MATH 150 Calculus I	
Community	
CHEM 316 Organic Chemistry II Learning	
Community	
CHEM 330 The History of Science: Non-Western Choose one of the following:	
Origins and the Western Revolution PHYS 100 Introduction to Physics I	

(HIST)3 ¹	PHYS 200 General Physics I4	
CHEM 335 The Chemistry of the Kitchen3		
CHEM 341 Drug Discovery and Development	Choose <u>one</u> of the following:	
(BUS/ECON)	PHYS 101 Introduction to Physics II4	
CHEM 343 Forensic Science	PHYS 201 General Physics II4	
CHEM 344 Energy and Society3 ¹		
CHEM 373 Physical Chemistry II3		
CHEM 410 Advanced Organic Synthesis4 ^L	Upper Division Requirements - 31 units	
CHEM 415 Molecular Structure Determination4 ^L	Students must obtain a grade of C or better in these courses to	
CHEM 420 Advanced Inorganic Chemistry3		
CHEM 450 Instrumental Analysis and Laboratory4 ^L	apply them to the chemistry major.	
CHEM 465 Bioinorganic Chemistry4 L		
CHEM 490 Special Topics in Chemistry1-3	1. Chemistry	
CHEM 492 Internship/ Service Learning 1-3 ^{L, R}	CHEM 305 Computer Applications in Chemistry 1	
CHEM 494 Independent Research1-3 L, R	CHEM 311 Organic Chemistry I3	
CHEM 497 Directed Studies1-3 R	CHEM 312 Organic Chemistry I Laboratory 1	
ī	CHEM 314 Organic Chemistry II3	
¹ Upper-division interdisciplinary GE credit (CHEM 330- 349 or CF	organic organic framesic in European in Eu	
may be applied as chemistry electives	CHEM 371 Physical Chemistry I3	
towards the degree.	CHEM 372 Physical Chemistry Laboratory1	
Ray	CHEM 460 Biochemistry I4	
R No more than a combined total of six units of CHEM 492, 494, and 497 m	CILLII 101 Biomenius Ji	
electives. No more than one CHEM 492 or CHEM 494 may be (by petition) considered a CHEM 499 Chemistry Capstone	
laboratory elective.		
D 1 10 1 101 GD G	2. Biology	
Required Supporting and Other GE Courses	BIOL 300 Cell Biology4	
42 units	BIOL 400 Molecular Biology4	
American Institutions Requiremen6		
Other Courses in GE Categories A-E36	(Twelve units of the above requirements will be counted toward lower-division GE	
Electives in Any Discipline5	Categories B1, B2, B3, & B4)	
Proposed Course of Study	Upper Division Chemistry Electives	
•	**	
Bachelor of Science in Chemistry, Biochemistry Option		
T1 4 T7	Students must obtain a grade of C or better in these courses to	
First Year	apply them to the chemistry major.	
Fall		
CHEM 121 General Chemistry I4	A total of three units of electives from those listed below are needed. Lab courses are	
1		
MATH 150 Calculus I4	denoted .	

BIOL 200 Principles of Organismal and CHEM 301 Environmental Chemistry - Atmosphere and Climate
GE B2 CHEM 302 Environmental Chemistry -
General Education Soil and Water 4 ^{LL}
CHEM 313 Organic Chemistry I Learning
Spring Community
BIOL 201 Principles of Cell and CHEM 316 Organic Chemistry II Learning
Molecular Biology4 Community
CHEM 122 General Chemistry II4 CHEM 330 The History of Science: Non-Western
MATH 151 Calculus II4 Origins and the Western Revolution
General Education
CHEM 335 The Chemistry of the Kitchen
Second Year CHEM 341 Drug Discovery and Development
Fall (BUS/ECON)
CHEM 311 Organic Chemistry I
CHEM 312 Organic Chemistry I Laboratory
Physics requirement
(PHYS 100 or 200) CHEM 410 Advanced Organic Synthesis
General Education
CHEM 420 Advanced Inorganic Chemistry
Spring CHEM 450 Instrumental Analysis and Laboratory4 ^L
CHEM 250 Quantitative Analysis
CILLII 150 Special Topics in Chemistry minimum 1
CHEM 315 Organic Chemistry II Laboratory
General Education
General Education 497 Directed Studies 1-3
Third Year Upper-division interdisciplinary GE credit (CHEM 330- 349 or CHEM 430-449)
Fall may be applied as chemistry electives
CHEM 305 Computer Applications in Chemistry
GE B4
CHEM 371 Physical Chemistry I
CHEM 372 Physical Chemistry Laboratory
BIOL 300 Cell Biology4 laboratory elective.
General Education or Electives6
Required Supporting and Other GE Courses
Spring - <u>14</u> units 42 units
Chemistry Elective

BIOL 400 Molecular Biology4	Other Courses in GE Categories A-E36		
General Education or Electives6-7	Electives in Any Discipline		
Fourth Year	Proposed Course of Study		
Fall	Bachelor of Science in Chemistry, Biochemistry Option		
CHEM 460 Biochemistry I4	,		
Chemistry Elective or Independent Research	First Year		
General Education of Electives	Fall		
Spring	CHEM 121 General Chemistry I4		
CHEM 461 Biochemistry II4	GE B1		
CHEM 499 Chemistry Capstone2	MATH 150 Calculus I4		
General Education or Electives9	GE B3		
	BIOL 200 Principles of Organismal and		
	Population Biology4 GE B2		
	General Education		
Minor in Chemistry - (23 units)	General Education		
	Spring		
	BIOL 201 Principles of Cell and		
Lower Division	Molecular Biology4		
Requirements - 8 units	CHEM 122 General Chemistry II4		
CHEM 121 General Chemistry I and Laboratory4	MATH 151 Calculus II4		
CHEM 122 General Chemistry II and Laboratory4	General Education		
, , , , , , , , , , , , , , , , , , ,			
Upper Division Requirements - 8 units	Second Year		
CHEM 311 Organic Chemistry I3	Fall		
CHEM 312 Organic Chemistry I Laboratory1	CHEM 311 Organic Chemistry I		
CHEM 314 Organic Chemistry II3	CHEM 312 Organic Chemistry I Laboratory1		
CHEM 315 Organic Chemistry II Laboratory1	Physics requirement		
	General Education6-7		
Electives - 7 units	General Education		
A total of seven units of electives (CHEM 250, CHEM 251, or courses numbered 300 or	Spring		
higher) in addition to those required, are needed. A maximum of three units of upper-	CHEM 250 Quantitative Analysis3		
division interdisciplinary GE credit (CHEM 330-349 or CHEM 430-449) may be applied as	CHEM 251 Quantitative Analysis Laboratory 1		
chemistry electives towards the degree. One unit of Chemistry learning community courses	CHEM 314 Organic Chemistry II3		
(i.e., CHEM 313 and 316) may be used as electives toward the degree. No more than a	CHEM 315 Organic Chemistry II Laboratory1		
combined total of six units of CHEM 492, 494, and 497 may be applied as electives.	Physics requirement (PHYS 101 or 201)4		
	General Education		

Certificate in Chemistry - (23 units)

Electives - 7 units

A total of seven units of electives (CHEM 250, CHEM 251, or courses numbered 300 or higher) in addition to those required, are needed. A maximum of three units of upper-division interdisciplinary GE credit (CHEM 330-349 or CHEM 430-449) may be applied as chemistry electives towards the degree. One unit of Chemistry learning community courses (i.e., CHEM 313 and 316) may be used as electives toward the degree. No more than a combined total of six units of CHEM 492, 494, and 497 may be applied as electives.

773 1 3 7 7		
Third Year	r	
Fall		
CHEM	305	Computer Applications in Chemistry 1
	GE B4	
CHEM	371	Physical Chemistry I3
CHEM	372	Physical Chemistry Laboratory1
BIOL	300	Cell Biology4
General	Educatio	on or Electives6
<i>Spring - <u>14</u></i>	units	
		ve3-4
BIOL	400	Molecular Biology
		on or Electives6-7
General	Educado	on of Electives0-/
Fourth Ye	~**	
	аг	
Fall		
CHEM		Biochemistry I4
		ve or Independent Research3-4
General	Education	on or Electives6-7
Spring		
CHEM	461	Biochemistry II4
CHEM	499	Chemistry Capstone
General	Educatio	on or Electives9
Contract		or =1000, 00
	Minor	in Chemistry - (23 units)
	IVIIIOI	in Chemistry - (23 units)
Lower F)ivisio	n Requirements - 8 units
		<u> </u>
Lower D		n Requirements - 8 units General Chemistry I and Laboratory4

General Chemistry II and Laboratory 4

Upper Division Requirements - 8 units

3.4.08 km2

CHEM 122

	CHEM 315 Organic Chemistry II Laboratory	
	Certificate in Chemistry - (23 units)	
	Lower Division Requirements - 8 units CHEM 121 General Chemistry I and Laboratory	
	CHEM 311 Organic Chemistry I Laboratory	
	Electives - 7 units A total of seven units of electives (CHEM 250, CHEM 251, or courses numbered 300 or higher) in addition to those required, are needed. A maximum of three units of upper-division interdisciplinary GE credit (CHEM 330-349 or CHEM 430-449) may be applied as chemistry electives towards the degree. One unit of Chemistry learning community courses (i.e., CHEM 313 and 316) may be used as electives toward the degree. No more than a combined total of six units of CHEM 492, 494, and 497 may be applied as electives.	

SUMMARY OF CHANGES

1) Students will be required to obtain grades of C or better in Lower and Upper Division Requirements, and in Chemistry Electives.

- 2) The words "Pending CCTC Approval" are removed from our Subject Matter Teaching Option. The option is not pending CCTC approval. What is pending CCTC approval is whether that option is a substitute for the subject matter exam in chemistry. Regardless of whether it will be or not, this is the option that best prepares student for teaching chemistry at the high school level.
- 3) We have added CHEM 491 as an elective.
- 4) There was a typo in CHEM 302 in both B.S. options.

JUSTIFICATION

- 1) We want our students to obtain passing grades (a C or better) in all chemistry courses, and other required major courses, in order to get a degree in chemistry.
- 2) The option is not pending CCTC approval. What is pending CCTC approval is whether that option is a substitute for the subject matter exam in chemistry. Regardless of whether it will be or not, this is the option that best prepares student for teaching chemistry at the high school level.
- 3) This course is being proposed and needs to be added as an elective.
- 4) CHEM 302 is a lab class and was not listed as such in either B.S. option.
- 5) Correct units of CHEM 250 AND 251
- 6) Clarify "R" footnote to be expressed in units

_Simone Aloisio	_10/27/2009
Proposer of Program Modification	Date

Program: CHEMISTRY

Program Chair		
	Signature	Date
Commingations Charin		
Curriculum Chair		
	Signature	Date
Dean of Faculty		
	Signature	Date