CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

COURSE MODIFICATION PROPOSAL

Courses must be submitted by October 15, 2013, and finalized by the end of the fall semester to make the next catalog (2014-15) production

DATE (CHANGE DATE EACH TIME REVISED): 10/14/2013; REV 11.13.13

PROGRAM AREA(S) : CHEMISTRY

Directions: All of sections of this form must be completed for course modifications. Use YELLOWED areas to enter data. All documents are stand alone sources of course information.

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1. Indicate Changes and Justification for Each. *[Mark an X by all change areas that apply then please follow-up your X's with justification(s) for each marked item. Be as brief as possible but, use as much space as necessary.]*

- Course title
- Prefix/suffix
- Course number
- Units
- Staffing formula and enrollment limits
- x Prerequisites/Corequisites
- X Catalog description
- x Mode of Instruction
- Course Content
- Course Learning Outcomes
- References
- GE
- Other
- Reactivate Course

Justification: We want to remove CHEM 305 from all of the pre-requisites that require it. The department decided it was not necessary and hindered student progress towards degree completion. We are standardizing the language on these classes too, for example, removing consent of instructor since this is the case for all classes.

2. Course Information.

[Follow accepted catalog format.] ***(Add additional prefixes i f cross-listed)***

OLD

Prefix CHEM Course# 450

Title **INSTRUMENTAL ANALYSIS AND LABORATORY** Units (4)

3 hours lecture per week

13hours lab per week

x Prerequisites: CHEM 250, CHEM 251, CHEM 305 (or concurrent enrollment),and CHEM 315 with a grade of C or better.

Consent of Instructor Required for Enrollment

Corequisites:

Catalog Description (Do not use any symbols):

This course is designed to introduce chemical analysis using instrumental methods. Areas covered will include atomic and molecular spectroscopy, chromatography, and mass spectroscopy. Lectures will focus on theory and application of these techniques to organic, inorganic, and biochemical analysis. Experimental design, materials used in scientific apparatus, vacuum science and electronic circuits will also be examined. Lab fee required.

General Education Categories:

Grading Scheme (Select one below):

x A – F

Credit/No Credit

Optional (Student's Choice)

Repeatable for up to units

Total Completions

Multiple Enrollment in Same Semester Y/N

Course Level:

x Undergraduate

NEW

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Consent of Instructor Required for Enrollment

Corequisites:

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Grading Scheme (Select one below):

x A – F

Credit/No Credit

Optional (Student's Choice)

Repeatable for up to units

Total Completions

Multiple Enrollment in Same Semester Y/N

Course Level:

x Undergraduate

Post-Baccalaureate
Graduate

Post-Baccalaureate
Graduate

3. Mode of Instruction (Hours per Unit are defaulted) **Hegis Code(s)**_____
(Provided by the Provost Office)

Existing

	Units	Hours Per Unit	Default Section Size	Graded
Lecture	3	1	36	x
Seminar		1		
Lab	1	3	18	x
Activity		2		
Field Studies				
Indep Study				
Other blank				
Online				

Proposed

	Units	Hours Per Unit	Default Section Size	Graded	CS No. (filled out by Provost Office)
Lecture	3	1	36	x	
Seminar		1			
Lab	1	3	12	x	
Activity		2			
Field Studies					
Indep Study					
Other blank					
Online					

4. Course Attributes:

General Education Categories: All courses with GE category notations (including deletions) must be submitted to the GE website: http://summit.csuci.edu/geapproval. Upon completion, the GE Committee will forward your documents to the Curriculum Committee for further processing.

A (English Language, Communication, Critical Thinking)
- A-1 Oral Communication
- A-2 English Writing
- A-3 Critical Thinking

B (Mathematics, Sciences & Technology)
- B-1 Physical Sciences
- B-2 Life Sciences – Biology
- B-3 Mathematics – Mathematics and Applications
- B-4 Computers and Information Technology

C (Fine Arts, Literature, Languages & Cultures)
- C-1 Art
- C-2 Literature Courses
- C-3a Language
- C-3b Multicultural

D (Social Perspectives)

E (Human Psychological and Physiological Perspectives)

UDIGE/INTD Interdisciplinary

Meets University Writing Requirement (Graduation Writing Assessment Requirement)

Meets University Language Requirement

American Institutions, Title V Section 40404: Government US Constitution US History
Regarding Exec Order 405, for more information: http://senate.csuci.edu/comm/curriculum/resources.htm

Service Learning Course (Approval from the Center for Community Engagement must be received before you can request this course attribute).

Online Course (Answer YES if the course is ALWAYS delivered online).

5. Justification and Requirements for the Course. *[Make a brief statement to justify the need for the course]*

OLD

This course is typically taken by Chemistry majors, as well as other science majors, who are interested in using instrumentation for chemical analysis in their profession or graduate studies. This course will be an upper-division elective for chemistry majors.

Requirement for the Major/Minor
x Elective for the Major/Minor
Free Elective

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x Elective for the Major/Minor
Free Elective

Submit Program Modification if this course changes your program.

6. Student Learning Outcomes. (List in numerical order. Please refer to the Curriculum Committee's "Learning Outcomes" guideline for measurable outcomes that reflect elements of Bloom's Taxonomy: *http://senate.csuci.edu/comm/curriculum/resources.htm*. The committee recommends 4 to 8 student learning outcomes, unless governed by an external agency (e.g., Nursing).

Upon completion of the course, the student will be able to:

OLD

•Outline the development of the field of instrumental chemical analysis from a historical perspective including different techniques and how these techniques have contributed to the science.
•Describe the theories governing spectroscopy, chromatography, and mass spectroscopy.
•Demonstrate the ability to use state-of-the-art scientific instrumentation in the analysis of organic, inorganic and biochemical samples.
•Describe how molecular shape, electronic structure, thermodynamics, kinetics, and intermolecular interactions are involved in instrumental analysis.
•Compare advantages and disadvantages of commonly used techniques in chemical analysis.
•Describe simple electronic circuits, vacuum technology, optics, and materials used in construction of scientific apparatus.
•Plan their own chemistry experiments using scientific instrumentation.
•Evaluate methodologies utilizing scientific instrumentation for reasonable limits to what data can be obtained from these techniques.
•Interpret, discuss, and evaluate a primary literature article

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7. Course Content in Outline Form. (Be as brief as possible, but use as much space as necessary)

OLD

Fundamentals of Instrumentation
Experimental Design Materials Vacuum Technology Optics Charged Particle Optics Electrical Components and Circuits Signals and Noise *Optical Spectroscopy* Components of an Optical Instrument Atomic Absorption, Fluorescence, and Emission X-Ray spectroscopy UV/Visible Spectroscopy and fluoresce Infrared Spectroscopy, Raman, and Fourier Transforms Nuclear Magnetic Resonance Spectroscopy *Separation Methods* Gas Chromatography Liquid Chromatography Supercritical Fluid Chromatography and Extraction Capillary and Gel Electrophoresis *Mass Spectroscopy* Sector and Electrostatic Analyzers Quadropole Mass Spectroscopy Other charged particle separation techniques Surface Techniques *Electroanalytical Techniques* Potentiometry, Coulometry, and Voltametry

NEW

Fundamentals of Instrumentation
Experimental Design Materials Vacuum Technology Optics Charged Particle Optics Electrical Components and Circuits Signals and Noise *Optical Spectroscopy* Components of an Optical Instrument Atomic Absorption, Fluorescence, and Emission X-Ray spectroscopy UV/Visible Spectroscopy and fluoresce Infrared Spectroscopy, Raman, and Fourier Transforms Nuclear Magnetic Resonance Spectroscopy *Separation Methods* Gas Chromatography Liquid Chromatography Supercritical Fluid Chromatography and Extraction Capillary and Gel Electrophoresis *Mass Spectroscopy* Sector and Electrostatic Analyzers Quadropole Mass Spectroscopy Other charged particle separation techniques Surface Techniques *Electroanalytical Techniques* Potentiometry, Coulometry, and Voltametry

Does this course content overlap with a course offered in your academic program? Yes **No**
If YES, what course(s) and provide a justification of the overlap.

Does this course content overlap a course offered in another academic area? Yes **No**
If YES, what course(s) and provide a justification of the overlap.

Overlapping courses require Chairs' signatures.

8. Cross-listed Courses (Please note each prefix in item No. 1) *Beyond three disciplines consult with the Curriculum Committee.*

A. List cross-listed courses (Signature of Academic Chair(s) of the other academic area(s) is required).
B. List each cross-listed prefix for the course:
C. Program responsible for staffing:

9. References. *[Provide 3-5 references]*

OLD Moore, J.H.; Davis, C.C.; Coplan, M.A.; Greer, S. *Building Scientific Apparatus*, Addison-Wesley, 3rd Ed., 2002 Skoog, D.A.; Holler, F.J.; and Nieman, T.A. *Principles of Instrumental Analysis*, Brooks-Cole, 5th Ed., 1998 Strobel, H.A.; and Heineman, W.R. *Chemical Instrumentation*, Wiley, 3rd Ed., 1989

NEW Moore, J.H.; Davis, C.C.; Coplan, M.A.; Greer, S. *Building Scientific Apparatus*, Addison-Wesley, 3rd Ed., 2002 Skoog, D.A.; Holler, F.J.; and Nieman, T.A. *Principles of Instrumental Analysis*, Brooks-Cole, 5th Ed., 1998 Strobel, H.A.; and Heineman, W.R. *Chemical Instrumentation*, Wiley, 3rd Ed., 1989

10. Tenure Track Faculty qualified to teach this course.
Aloisio

11. Requested Effective Date or First Semester offered: Fall 2014

12. New Resource Requested: Yes **No** x
If YES, list the resources needed.

A. Computer Needs (data processing, audio visual, broadcasting, other equipment, etc.)
B. Library Needs (streaming media, video hosting, databases, exhibit space, etc.)
C. Facility/Space/Transportation Needs:
D. Lab Fee Requested: Yes **No** **(Lab fee requests should be directed to the Student Fee Committee)**
E. Other.

13. Will this course modification alter any degree, credential, certificate, or minor in your program? Yes **No** x
If, YES attach a program update or program modification form for all programs affected.
Priority deadline for New Minors and Programs: October 1, 2013 of preceding year.

Priority deadline for Course Proposals and Modifications: October 15, 2013.
Last day to submit forms to be considered during the current academic year: April 15th.

Simone Aloisio	10/14/2013
Proposer(s) of Course Modification Type in name. Signatures will be collected after Curriculum approval.	Date

Approval Sheet

Course:

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
Program Chair		
	Signature	Date
Program Chair		
	Signature	Date
General Education Chair		
	Signature	Date
Center for Intl Affairs Director		
	Signature	Date
Center for Integrative Studies Director		
	Signature	Date
Center for Multicultural Engagement Director		
	Signature	Date
Center for Civic Engagement and Service Learning Director		
	Signature	Date
Curriculum Chair		
	Signature	Date
AVP		
	Signature	Date