



**Chemistry  
PROGRAM REVIEW REPORT  
2014 - 2015**

**Faculty and Staff (List all)**

<b>Full Time</b>	<b>Adjunct</b>	<b>Support Staff</b>
Farahani, Badieh	Entus, Robert	Madison, Mary
Miles, Terrence	Farnum, Martin	Pagano, Chris
Ryba, David	Johnson, Steven	
	Montgomery, Robert	
	Smyth, Nathaniel	
	Mayo, Daniel	
	Engler, Diane	
	Choppi, Ron	



## Chemistry

### I. Executive Summary

#### **Program Description:**

Chemistry, a natural science, studies the composition, structure, properties, and reactions of matter, especially of atomic and molecular systems. Courses include organic and inorganic chemistry as well as quantitative analysis. Chemistry courses satisfy general education requirements for the associate degree, lower division transfer, transfer degrees and can be used to fulfill some of the major requirements for the associate degree in Biological and Physical Sciences and Mathematics.

Courses in Chemistry are offered throughout the week in the day and evening.

#### **Strengths/Effective Practices:**

All classes except for Chem. 111 are taught by full time faculty. The program works with adjunct faculty in assessment of SLOs.

#### **Weaknesses/Lessons Learned:**

There is a need for more sections of Chem. 103 and Chem. 104, the prerequisites for nursing programs. As a result more lab and classroom space as well as full time faculty are needed to support the demand.

#### **Recommendations/Next Steps:**

The immediate goal is to have a Chem. 103 section taught by an adjunct faculty on Saturdays. This may help to solve the increasing demand.



## Chemistry

### II. Curriculum

Course Number and Title (Courses must be reviewed every six years to remain active)	Date of last Curriculum Committee Review	2013 - 2014 Course offerings By Term and # of Sections				SLOs Assessed (Semester / year)
		Summer	Fall	Winter	Spring	
CHEM 103 College Chemistry	S11	2	3	2	3	Spring 2014
CHEM 104 College Chemistry	F13	0	1	0	1	Spring 2014
CHEM 106 Physical Science for Educators	S11	0	0	0	0	-
CHEM 110 Beginning Gen Chem	F13	1	8	0	8	Fall 2013
CHEM 111 General Chemistry	F08	1	3	0	3	Spring 2012
CHEM 112 General Chemistry	S09	0	3	0	3	Fall 2013
CHEM 210 Organic Chemistry	F13	0	1	0	0	Fall 2013
CHEM 211L Organic Chemistry Lab	F13	0	0	0	1	Fall 2013
CHEM 220 Organic Chemistry	F13	0	0	0	1	Spring 2014
CHEM 221L Organic Chemistry Lab	F13	0	0	0	1	Spring 2014
CHEM 698A Cooperative Education		0	0	0	0	
CHEM 698B Cooperative Education		0	0	0	0	
CHEM 698C Cooperative Education		0	0	0	0	
CHEM 698D Cooperative Education		0	1	0	0	
CHEM 699A Cooperative Education		0	0	0	0	

CHEM 699B Cooperative Education		0	0	0	0	
CHEM 699C Cooperative Education		0	0	0	0	
CHEM 699D Cooperative Education		0	0	0	0	

### III. Degrees and Certificates

Title	Type	Date Approved by Chancellor's Office	Number Awarded 2011	Number Awarded 2012	Number Awarded 2013	Number Awarded 2014
Biological and Physical Sciences (and Mathematics)	AS	1950	212	224	277	
Liberal Arts: Math and Science	AA	2009	23	19	18	

**TYPE:** **AA** = Associate in Arts **AS** = Associate in Science Degree **C** = Certificate **S** = Skill Award  
**AA-T** = Associate in Arts for Transfer **AS-T** = Associate in Arts for Transfer

#### IV. Sections Offered

Review the data sheet for section counts, which includes the following information by course category:

1. Section counts
2. Enrollment by student demographic
3. Success and retention

Provide a brief narrative analysis and describe any trends or concerns you noticed.

Total section counts in Chemistry have remained strong over the last several years despite the reductions in budgetary augmentation and student population across campus. This reflects the need to alleviate a pre-existing bottleneck in GE Science courses that interfered with student transfer and graduation.

Course offerings in the morning, afternoon, evening , and Saturday sections allows the department to provide coursework for a diversified student body.

#### V. Student Demographics

Review the data sheet for program enrollment, retention, and success which includes data on these metrics by student demographic

Provide a brief narrative analysis and describe any trends or concerns you noticed.

*For data on course sections, success and retention, and student demographics please refer to data packet in your program review folder. Observations and reflections related to these data can be addressed in the appropriate "plus one" addendum.*

*Observations and comments about course, program and college level data can be made below.*

Retention in our classes vary for different courses. For Chem 103, 104, 210, 211L, 220, and 220L the retention rate is about 95% and the success rate is about 75%. Increase in success rate must be increases. Based on student comments it their full-time work and family is the reason for failing classes. Students like the learning environment.

## VI. Student Accomplishments

Provide current, interesting information about accomplishments of students who have participated in this program.

Several of our students received end of the year achievement awards as well as the \$2,500 “Michael Dittmore” scholarship for transferring to a four year college and \$500 “Michael Dittmore” scholarship for the “EMT” program. Additionally, some of our students participated in a summer research experience at Cal Poly, Pomona and Cal State, Fullerton.

## VII. Student Learning Outcomes Assessment Reflection

Academic Senate Approved 4/11/12

All SLOs for every course will need to be assessed at least once within the 5-year comprehensive program review cycle. Upon reflection with program colleagues (or self-reflection for programs with only one instructor), please provide a brief narrative to the following (at least one row for one SLO needs to be completed for each course at this time):

Complete SLO assessment and analysis in the table at:

<http://intranet/SLO/Pages/default.aspx>

DOCUMENT REFLECTION DISCUSSION BELOW (FOR BOTH SUMMER/FALL 2013 AND WINTER/SPRING 2014)

Conversion between units which is important in many fields uses math and language skills. 80% success rate is a reasonably high bar.

In Spring 2013 we focused on students ability to name chemical compounds, conversions between units, and stoichiometry for Chem. 103, Chem. 104, O. Chem. 211L, and O. Chem. 221L. This was focused on student’s calculation SLOs. The pass rate on naming was 80% and on conversion between units were 70%. This shows a reasonable high bar.



## Chemistry

### VIII. Progress toward previous goals

During 2013 -2014, we accomplished:

	Previous Goals	Progress/ Persons Responsible	Status	Institutional Goal
<b>Goal 1 EMP</b>	Revise the curriculum as needed to create a transfer degree to meet the requirements of new statewide initiatives	The Organic Chemistry curricula were rewritten and approved to be compliant with CSU Transfer Degree requirements. We are in the process of drafting the transfer degree in Chemistry.	P	1.1.1 2.2.6 3.1.1
<b>Goal 2 EMP</b>	Collaborate with the Vice President of Administrative Services and Finance to improve the facility infrastructure and identify additional facilities space, especially storage space for supplies and equipment	Completed	C	3.1.4
<b>Goal 3 EMP</b>	Incorporate additional technology into chemistry laboratories, including computers and software	Completed	C	3.1.4
<b>Goal 4 2004-05</b>	Web pages for the discipline should be upgraded and "hit counters" should be employed to determine the degree to which they are accessed.	Web pages have been upgraded. Hit counters have not been added. Further, some instructors have made extensive use of the campus Blackboard platform as a means of communications, data storage, and communication of assessment to the students. Blackboard does offer a hit counter that may be used to track student use. Person responsible: Rabitoy	P	3.1
<b>Goal 5 2004-05</b>	Continue to develop web pages for classes and specific instructors. It would be helpful to have more district support for web page design and	The Blackboard platform has largely replaced the need for course specific web pages and is satisfactory in supplying the on-line demands of our students	C	2.2

	<p>maintenance. There is a large need to have “hit counters”, something that MIS has said would be difficult to provide under our current structure.</p>			
<b>Goal 6 2004-05</b>	<p>Need tracking information on Citrus graduates in order to follow their progress.</p>	<p>The department should contact the campus researcher to inquire as to whether or not this recommendation can be achieved. Person responsible: Rabitoy</p>	P	1.1
<b>Goal 7 2004-05</b>	<p>Need to develop a security system for record keeping/insuring integrity of student work.</p>	<p>The department has made some use of Turnitin.com via Blackboard and directly from the company (Turnitin.com) to check for plagiarism, but this is not employed by all instructors, nor is it employed across the curriculum. In some cases, it would not be useful as the writing components do not involve use of word processing (non-electronic). The verification routine employed in house allows for some tracking, but is tedious. Need still exists to limit copying and other malfeasance. Person responsible: department faculty/Rabitoy</p>	P	
<b>Goal 8 2004-05</b>	<p>Should Citrus consider hosting a science fair for area high schools similar to successful programs like that at Fullerton College?</p>	<p>The Department has hosted a local Science Fair for Sellers Elementary school, but has not expanded to the high school. Person responsible: Rabitoy</p>	P	6.1.1
<b>Goal 9 2004-05</b>	<p>Work with the counseling staff to develop academic “roadmaps” for students who will major in some aspect of science. Attend Counseling Department meetings in order to ensure that the counseling staff fully understands the appropriateness of specific chemistry courses for selected students.</p>	<p>Chemistry faculty will continue to have discussions with Counseling faculty regarding this issue. With the development of articulated transfer degrees added to the program, this issue will be taken care of in part. However, dialogue still needs to continue with Counseling to provide guidance for students pursuing the paths of certificate and degree completion. Persons responsible: department and Counseling faculty/Rabitoy</p>	P	3.1



<b>Goal 10 2004-05</b>	Increase the awareness of other Community Colleges and their programs. Plans are underway to have a fall 2005 meeting for area community college chemistry faculty.	Several of our adjunct faculty members teach at neighboring schools and dialogue has been continuous these individuals. As a result, the Citrus Chemistry Department has a sense of how neighboring departments conduct business. Person responsible: Rabitoy	C	6.1.1
<b>Goal 11 2004-05</b>	Reevaluate the ACS general chemistry format and possibly incorporate it into our program.	Need to look into Chemistry Diagnostic Exam for CHEM 110. Person responsible: department faculty: Miles	P	
<b>Goal 12 2004-05</b>	Develop a plan to test the effectiveness of student interactive devices ("Clickers") in chemistry lecture courses.	Clickers have not yet been implemented in classroom. Dialogue between publishers and the department will continue to address feasibility. Persons responsible: department faculty	I	1.2
<b>Goal 13</b>	Be proactive in obtaining student internships from JPL.	We currently have no lead in the department to serve as liaison to JPL. Need to reestablish contact. The "Space Owl" and "Rocket Owl" programs have largely fulfilled this need as many of our students are also Physics students that share common interests. In addition, The STEM research internships have supported this need. Persons responsible: Rabitoy/faculty	P	6.1.1
<b>Goal 14 2004-05</b>	Reevaluate safety features for labs and stockroom (i.e. showers, doors) and air turnover rates and develop consistent guidelines for safety procedures in the laboratory.	Have purchased first aid kits for all labs for minor injuries. However, the fume hoods continue to be an issue. Need Facilities to deal with flow problem. Persons responsible: Rabitoy	P	3.1.4
<b>Goal 1 2012</b>	Identify resources for expanding a lab facility including modular buildings	Spring 2013	P	1.1

<b>Goal 2 2012</b>	Revise the curriculum as needed to create a transfer degree to meet the requirements of new statewide initiatives	Waiting for SB1440 information from the state regarding a Chemistry transfer degree. Persons responsible: faculty/Rabitoy	P	1.1.1 2.2.6 3.1.1

**In addition to previous goals, during 2014 - 2015, we plan to:**

	<b>Description</b>	<b>Actions / Target Date</b>	<b>Institutional Goal**</b>
<b>Goal 1 2013</b>	Reevaluate all SLOs for content and effectiveness at reaching department goals	Collectively examine course SLOs to see if they reflect the department philosophy on teaching and learning. Spring 2014	1.1 2.2
<b>Goal 2 2013</b>	Systematically edit lab manual for chem 110 and/or supplement with published experiments from a commercial publisher	Dave Ryba will be drafting an updated version of the manual and the department will consider its implementation.	2.2
<b>Goal 3 2013</b>	Update course curricula for courses in that are due in current cycle	Examine and edit current credit course outlines. Nov. 2014	1.1 1.2
Goal 4	Modernize the Chem 111 lab via introduction of newer instrumentation and the hardware/software to support such systems (e.g. Purchase additional spectrophotometers and computers to interface with all in use)	Spectrophotometers have been purchased and are being used in the lab. Still, need exists for additional modern instrumentation (e.g. Data Studio software and computers to drive it).	1.1 1.2

*\*For instutional goals visit link below.*

<http://www.citruscollege.edu/admin/planning/Documents/StrategicPlan2011-2016.pdf>

*\*\*For Educational and Facilities Master Plan, use table below.*

EFMP 1 – Revise the curriculum as needed to create a transfer degree to meet the requirements of new statewide initiatives.
EFMP 2 – Collaborate with the Vice President of Administrative Services and Finance to improve the facility infrastructure and identify additional facilities space, especially storage space for supplies and equipment.
EFMP 3 – Incorporate additional technology into chemistry laboratories, including computers and software.





## Chemistry

### IX. Budget Recommendations for 2014 - 2015

(Add rows or attach additional pages as needed for complete description / discussion)

#### Certificated Personnel (FNIC)

Position	Discuss impact on goals / SLOs	Impact	Priority
Chem 110 Coordinator	Facilitate instructional uniformity within program		

#### Classified Personnel

Position	Discuss impact on goals / SLOs	Impact	Priority

#### Staff Development (Division)

Item	Discuss impact on goals / SLOs	Cost	Impact	Priority

#### Facilities (Facilities)

Describe repairs or modifications needed	Discuss impact on goals / SLOs	Building / Room	Impact	Priority
Ventilation in equipment room is needed				

#### Computers / Software (Tecs)

Item	Discuss impact on goals / SLOs	Cost	Impact	Priority
Upgraded version of Chem Draw is requested				

#### Equipment

Item	Discuss impact on goals / SLOs	Cost	Impact	Priority

#### Supplies (Division)

Item	Discuss impact on goals / SLOs	Cost	Impact	Priority
Chem 110 Diagnostic Exam	Will assist with SLO assessment	~\$150 for 50 exams		
New version(s) of ACS	Will assist with SLO assessment	~\$70 for		High

Exam for Chem112		25 exams		
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## General Budget Guidelines

### Budget Preparation Tips:

- Include items on the budget form that are needed for program success even if there is no financial need associated with the request (ie training that could be accomplished with on-campus resources, sharing of resources with another discipline or department etc.)
- Whenever possible, obtain actual cost for the items / equipment you wish to purchase. This avoids situations where items are considered for purchase but it is determined that the actual cost greatly exceeds the original estimate.
- Identify unit cost (cost per item) and the number of units desired in requests.
- Indicate if there is a lower level of financial support that would be workable in your educational plan – if you request \$30,000 for a classroom set of equipment (one item for each student), if \$15,000 were available, would it be possible for two students to share an item? Is the request “All or nothing”?

### Determining Budget Impact:

**Indicate one or more of the following areas that your request will affect:**

**M = Mission:** Does the request assist the program in meeting the District’s mission and established core competencies and / or diversity?

**N = Need:** Does the request assist the program in addressing needs based on labor market data, enrollment, articulation, advisory committee, regional agreements, etc.?

**Q = Quality:** Does the request assist the program in continuing or establishing appropriate lecture/lab unit values? Will the request assist in the regular reviewed / updated of course outlines? Is faculty development adequate? Does program need support in addressing the State and District emphasis on critical thinking, problem solving and written expression? Does program need support to meet stated objectives in the form of SLOs? Do course pre-requisites and co-requisites need to be validated?

**F = Feasibility:** Does the request assist the program maintain adequate facilities, equipment, and library resources? Is there a need for repair or modification of facilities? Is there a need for new equipment or supplies? Are course offerings frequent enough for students to make adequate progress in both day and evening programs? Does the program have adequate communication with & support from Counseling?

**C = Compliance:** Does the request assist the program in meeting Federal, State & District requirements? (Do the course outlines meet state, district & federal regulations for content? Do vocational programs have regular advisory meetings?)

### Budget Priorities:

**When establishing priority, consider the following:**

Priority 1: This item is mandated by law, rule, or district policy.

Priority 2: This item is essential to program success.

Priority 3: This item is necessary to maintain / improve program student learning outcomes.

