

The Comprehensive Instructional Program Review Report

1. College: Berkeley City College

Discipline, Department or Program: Chemistry

Date: October 15, 2015

Members of the Comprehensive Instructional Program Review Team:
Siraj Omar & Sam Gillette

Members of the Validation Team:

2. Narrative Description of the Discipline, Department or Program:

The most important goal of the science department, in which chemistry is one of the disciplines, is to provide students with the knowledge and skills they will need in order to perform successfully in the next stage of their careers, whether that stage involves transfer to a 4-year institution, entering a professional program of study such as nursing, or entering the workplace in a specialized field such as biotechnology. Another important goal is to build stepping stones to science in order to make careers in science accessible to students who have little or no background in science and math but who have been excited by the news and the potential of interesting jobs in biotechnology and other science related fields. A third goal of the science department is to provide the community with informative courses to enhance their understanding and appreciation of the world of science; these include seminar-style courses taught by local scientists and scientific laboratories and a monthly science seminar series.

Courses Offered in the Chemistry Department: The Chemistry Department offers the following transfer level courses for science majors: General Chemistry (1A and 1B), Organic Chemistry (12A and 12B), Introductory General Chemistry (30A) and Introductory Organic and Biochemistry (30B). Chemistry 1A is a highly demanded course because it is required for all science majors, including biological and physical sciences, medicine, dentistry and pharmacy. Chemistry 30A is required for transfer to the nursing and allied health programs. All chemistry courses at BCC are well attended and enrollments are relatively high. The Chemistry Department will also be offering an Analytical Instrumentation course (Chem 18) in the near future. The latest chemistry course will emphasize on training advanced students in laboratory and analytical techniques. This course is one of the major courses required for the Associate in Science Degree and Certificate of Achievement Programs in Analytical Chemistry, which is waiting for State approval.

Goals of Students enrolled in Chemistry Courses: Students enrolled in General Chemistry (1A and 1B) and in Organic Chemistry (12A & 12B) are planning to transfer to 4-year colleges or universities, or for entry into the medical, dental or the pharmacy program. Students enrolled in Introductory General Chemistry (Chem 30A) and Introductory Organic and Biochemistry are mostly planning to go to the Nursing or Allied Health Programs. At BCC chemistry courses are taught at the same level of rigor as similar courses taught at any 4-year colleges and universities. This is to ensure that our students are competitive edge with their classmates in 4-year colleges or universities where they have chosen to transfer.

A.S. Degree and Certificate Programs in Analytical Chemistry (under development): The Chemistry Department will be offering the Associate in Science Degree and Certificate of Achievement once the proposal to start this degree program at BCC receives the State approval. These programs will emphasize on laboratory techniques and analytical skills so that students after completing these programs will feel confident and skillful to join the workforce as qualified laboratory technicians.

Grants Awards

BCC Biology, Chemistry and Computer Information Science Departments are the recipients of the \$600,000 TAACCCT Funding established by the Department of Labor to develop successful career pathway for high school and community college students. With this grant funding, the Chemistry Department was able to purchase essential supplies equipment for teaching college level general and organic chemistry classes, as well as pay instructors to conduct Chemistry Boot Camp and run extra study sessions for Chemistry 1A. The Department realizes that with limited and dwindling college funding, procuring grant funding become essential for the future expansion of the course offering in chemistry as well as for maintaining the current level of chemistry offerings by the department.

3. Curriculum:

Please answer the following questions and/or insert your most recent curriculum review report (within the past 3 years) here.

Attach the Curriculum Review Report or Answer these Questions:

- Have all of your course outlines of record been updated or deactivated in the past three years? If not, list the courses that still need updating and specify when your department will update each one, within the next three years.

Please see attached document for the curriculum update status for chemistry courses. Most courses were updated within the last 3 years, but there are two courses (Chem 48UA-ZZ and Chem 49) that are overdue for update. The next round of update is Fall 2016.

- What are the discipline, department or program of study plans for curriculum improvement (i.e., courses or programs to be developed, enhanced, or deactivated)?

All chemistry courses offered at BCC (Chem 1A, 1B, 12A, 12B, 30A and 30B) are active

- Please list your degrees and/or certificates. Can any of these degrees and/or certificates be completed through Distance Education (50% or more of the course online)? Which degree or certificate?

The Analytical Chemistry AS Degree and CA programs are waiting for state approval and anticipated date for the program offering to start in Fall 2016.

4. Assessment:

Please answer the following questions and attach the TaskStream “At a Glance” report for your discipline, department, or program for the past three years Please review the “At a Glance” reports and answer the following questions.

COURSES	Data available from previous rounds?	Action Plan from Previous Rounds?	Notes	Fall 2015	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Spring 2018
CHEM 001A-General Chemistry	Y	Y					X		
CHEM 001B-General Chemistry	Y	Y					X		
CHEM 012A Organic Chemistry	Y	Y			X				
CHEM 012B Organic Chemistry	Y	Y			X				
CHEM 030A-Introductory Inorganic Chemistry	Y	Y				X			
CHEM 030B-Introductory Organic and Biochemistry	Y	Y				X			

Questions:

- How does your discipline, department or program ensure that students are aware of the learning outcomes of the courses and instructional programs in which they are enrolled? Where are your discipline, department or program course and program SLOs published? (For example: syllabi, catalog, department website, etc. If they are on a website, please include a live link to the page where they can be found)
 - For course SLOs
 - Syllabi
 - Student Learning Outcomes webpage: <http://www.berkeleycitycollege.edu/wp/slo/student-learning-outcomes/>
 - For Program Learning Outcomes
 - College Catalog (printed and on the website http://www.berkeleycitycollege.edu/bccdocs/BerkeleyCityCollege_2015_17Catalog.pdf)
 - Program Assessment Matrices webpage: <http://www.berkeleycitycollege.edu/wp/slo/program-assessment-matrices/>
- Briefly describe at least three of the **most significant changes/improvements** your discipline, department or program made in the past three years as a response to course and program assessment results. Please state the course number or program name and assessment cycle (year) for each example and attach the data from the “Status Report” section of TaskStream for these findings.

Improvement 1. Chemistry 12A; Fall 2015: To improve outcomes in applying mechanisms to thermodynamic and kinetic principles, an additional textbook was added to the class that specifically addresses mechanisms.

Improvement 2. Chemistry 12A and 12B; Fall 2015: To improve outcomes in spectroscopy, needed laboratory equipment and instrumentation was purchased.

Improvement 3. Chemistry 12A and 12B; Fall 2015: To improve and better assess outcomes correctly recording data into a lab notebook and interpreting results, a new grading rubric for notebooks and lab reports was created.

- Briefly describe three of the **most significant examples** of your discipline, department or program plans for course and /or program level improvement for the next three years as result of what you learned during the assessment process. Please state the course number or program name and attach the data from the “Assessment Findings and Action Plan” section for each example.

Plan 1. Chemistry 1A: Develop a comprehensive assessment tool.

Plan 2. Chemistry 12A and 12B: Purchase an infrared spectrophotometer to aid in student understanding of spectroscopy.

Plan 3. Chemistry 12A and 12B: Obtain additional versions of the assessment tool, American Chemical Society Exam for Organic Chemistry. We currently have only one version for each class and need to rotate additional versions into the assessment cycles. Students who repeat the courses should see fresh versions of the assessment tool.

Plan 4. Chemistry 12A and 12B: Purchase additional chemistry glassware kits for the labs. Organic chemistry students traditionally do not work in pairs in the lab. We currently have only enough lab kits for students to work in teams on lab activities. When students are required to take personal responsibility for their own equipment and laboratory data, the level of safety and quality of laboratory notebook management increases. The current team approach we are using in lab allows students to take shortcuts in both areas. The limited glassware currently on hand also creates an impediment to growth. No new sections of chem 12A or B could be accommodated without additional glassware.

- Describe how assessment results for Distance Education courses and/or programs compare to the results for the corresponding face-to-face classes.

Not Applicable. The Science Department does not offer online courses.

- Describe assessment results for courses with multiple sections. Are there similar results in each section?

As an institution, BCC has not focused on assessment results within individual sections of courses. We have found it most useful to assess SLOs on a global level, rather than focusing on the limited data available within individual sections.

- Describe your discipline, department or program participation in assessment of institutional level outcomes (ILOs).

Chemistry 12A and 12B: Self Awareness and Interpersonal skills (teamwork) ILO: Assessed Fall 2015
 Chemistry 1A and 1B: Computational Skills ILO: Plan to assess Fall 2015 or Spring 2016

- How are your course and/or program level outcomes aligned with the institutional level outcomes? Please describe and attach the “Goal Alignment Summary” from TaskStream.

See attachment:

5. Instruction:

- Describe effective and innovative strategies used by faculty to involve students in the learning process.

Chemistry boot camp: Prior to the commencement of classes and throughout the semester, students enrolled in chemistry courses are encouraged to attend boot camps where basic skills are reinforced.

Lunchtime STEM career seminars: Students are encouraged to attend lunchtime STEM career lunch talks where local leaders in scientific research discuss their work and research. The level of student participation in these talks has been impressive. As measured by the quantity and quality of questions students ask faculty after each of these seminars, they are proving to be great vehicles to pique student curiosity in science careers and scientific learning.

- How has new technology been used by the discipline, department or program to improve student learning?

On-line submission of lab reports and other assignments using turnitin.com have been used. This has provided students with streamlined grading and feedback while helping to ensure academic integrity using the site. Using turnitin.com has also helped students understand the concept of originality of work; some students are unaware that plagiarism is a form of academic dishonesty.

We have also used socrative.com to engage students in group activities. This has been effectively used to teach laboratory safety and create lively discussions in class and labs about key concepts.

- How does the discipline, department, or program maintain the integrity and consistency of academic standards with all methods of delivery, including face to face, hybrid, and Distance Education courses?

We only offer face-to-face courses in the chemistry department. Academic standards are delineated in class syllabi and actively are reinforced in lecture and lab courses. All chemistry courses currently offered at BCC have a lab component and consequently have 8 to 9 contact hours with students.

- How do you ensure that Distance Education classes have the same level of rigor as the corresponding face-to-face classes?

Not Applicable. The Science Department does not offer DE courses.

- Briefly discuss the enrollment trends of your discipline, department or program. Include the following:

- Overall enrollment trends in the past three years

Term	Fall 2012	Spring 2013	Fall 2013	Spring 2014	Fall 2014	Spring 2015
Chemistry enrollment	217	223	268	279	262	299

- An explanation of student demand (or lack thereof) for specific courses.

There is a great demand for courses like Chem 1A (first semester college general chemistry) and Chem 30A (introductory general chemistry). The former is required for all majors in the sciences, dental as well as medical professions, which the latter is a required course for the nursing and allied health programs. Currently, the science department offers 4 sections of Chem 1A and 2 section of Chem 30A. Each of these courses will fill up within 3 weeks after registration is opened to the public.

- Productivity for the discipline, department, or program compared to the college productivity rate.

The average productivity for chemistry in the last 3 years is 18.36, which is slightly above the college average of 18.05.

College productivity rate 18.05 (The average of last 3 years)

Term	Fall 2012	Spring 2013	Fall 2013	Spring 2014	Fall 2014	Spring 2015	3 Yrs Avg
Chemistry Productivity	19.08	19.38	17.95	18.23	17.55	17.99	18.36%

- Salient factors, if known, affecting the enrollment and productivity trends you mention above.
- Are courses scheduled in a manner that meets student needs and demands? How do you know?
- Recommendations and priorities.

6. Student Success:

- Describe course completion rates (*% of students that earned a grade "C" or better or "Credit"*) in the discipline, department, or program for the past three years. Please list each course separately. How do the discipline, department, or program course completion rates compare to the college course completion standard?

College course completion standard: 70%

Department/discipline course completion rates:

Course 1. <u>Chem 1A</u> (course name and number)	<u>49.12%</u> rate
Course 2. <u>Chem 1B</u> (course name and number)	<u>61.91%</u> rate
Course 3. <u>Chem 12A</u> (course name and number)	<u>75.50%</u> rate
Course 4. <u>Chem 12B</u> (course name and number)	<u>75.47%</u> rate
Course 5. <u>Chem 30A</u> (course name and number)	<u>70.99%</u> rate
Course 6. <u>Chem 30B</u> (course name and number)	<u>53.54%</u> rate

Discussion:

- Completion/Success rates in chemistry courses are generally low, and this appears to be common throughout colleges in the Peralta District.
 - One major reason for this is due to the lack of stringent pre-requisite requirement for the college level chemistry course. For example, in most colleges outside the Peralta District the pre-requisite for Chemistry 1A is Introductory General Chemistry, such as Chem 30A. However, the pre-requisite to enroll in Chemistry 1A at colleges in the Peralta District is only Intermediate Algebra (Math 203), which is insufficient to cope with the rigor that students have to face in the college level general chemistry (Chem 1A & 1B).
 - As a result, students enrolled in Chem 1A at Berkeley City College as well as other colleges in the district, such as College of Alameda, Laney College, and Merritt College, are mostly underprepared, especially those students coming from public schools where the rigor in science education is rather lacking, either due to shortage of qualified teachers or lack of funding to properly teach the science courses, especially chemistry.
 - To remedy this situation, firstly, all 4 colleges in the Peralta District must adopt a more stringent pre-requisite for student to enroll in Chem 1A, such as making Introductory General Chemistry (Chem 30A or its equivalent), in addition to Intermediate Algebra, as a pre-requisite to Chem 1A.
 - An alternative to this is that students would be required to take and pass an Assessment Test administered by the Assessment Center of each college, before they can enroll in Chem 1A.
 - Secondly, Berkeley City College must provide funding to pay instructors and qualified tutors to conduct weekly chemistry tutorials throughout the semester, and make this mandatory to students enrolled in Chem 1A to attend at least one tutorial session per week. With a strong foundation in basic chemistry, students will perform better in their first semester college level general chemistry and it will strengthen their performance in the subsequent chemistry courses they enroll.
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- Describe course completion rates in the department for **Distance Education** courses (100% online) for the past three years. Please list each course separately. How do the department's Distance Education course completion rates compare to the college course completion standard?

Not Applicable. The Science Department does not offer online courses.

- Describe course completion rates in the department **for Hybrid** courses for the past three years. Please list each course separately. How do the department's Hybrid course completion rates compare to the college course completion standard?

Not Applicable. The Science Department does not offer Hybrid courses.

- Are there differences in course completion rates between face to face and Distance Education/hybrid courses? If so, how does the discipline, department or program deal with this situation?

Not Applicable. The Science Department does not offer online or Hybrid courses.

- Describe the discipline, department, or program retention rates (After the first census, the percent of students earning any grade but a "W" in a course or series of courses) for the past three years. How does the discipline, department, or program retention rate compare to the college retention standard?

College retention standard: **70%**

Retention Rates for Chemistry from Fall 2012 to Spring 2015

Year 1. Fa2012/Sp2013 Average = 70.2%

Year 2. Fa2013/Sp2014 Average = 66.4%

Year 3. Fa2014/Sp2015 Average = 69.3%

(Please see attached document on retention rates for detail)

Discussion:

Among chemistry courses, Chem 1A classes generally have low retention rates. The main reason for this is that the pre-requisite for this class (Intermediate Algebra) is rather inadequate. As a result, students enrolled in this class are not well prepared for the rigor this class demands. Each semester about 40% of students enrolled in Chem 1A dropped out of the class. The retention trends in Chem 1B are only slightly better than Chem 1A, but still below college standard. Chem 12A and 12B classes enjoy a healthy retention rates of over 80% as students enrolled in these classes have gone through Chem 1A and Chem 1B and are obviously well prepared to face challenges in the organic chemistry classes (Chem 12A & 12B).

- What has the discipline, department, or program done to improve course completion and retention rates? What is planned for the next three years?

1) Since 3 years ago the department conducts assessment tests in general chemistry during the first week of class to determine Math readiness of students enrolled in Chem 1A. The department used the assessment test results to advise students who failed the assessment tests to withdraw from the class and to give their spaces to students who were trying to add the class and did well in the assessment test. While some students took the advice, many insisted on staying, and the consequence was many could not keep up with the rigor the class demanded.

2) Starting this (Fall) semester, the department is conducting a trial run on Chemistry Boot Camp during the week before semester started. Students enrolled in Chem 1A were invited to attend a 4-day boot camp on voluntary basis. The objective of the boot camp is to provide students basic concepts and calculations related to chemistry fundamentals. However, attendance was rather poor because it was not well advertised and attendance was a voluntary one. In future the department intends to make this boot camp a mandatory one if it is seen that this activity improves student retention.

3) During this fall semester, the department also conducts weekly study groups during lunch hours for Chem 1A students. Since this a trial run, attendance for the study group is also a voluntary one. In future, the department intends to run more organized study sessions for Chem 1A students and makes it mandatory for students who were consistently failing quizzes or the first midterm exam to attend the study group sessions, at least once a week.

4) In addition to the above, the department also conducts weekly tutorial sessions in the chemistry laboratory as well as in the LRC.

- Which has the discipline, department, or program done to improve the number of degrees and certificates awarded? Include the number of degrees and certificates awarded by year, for the past three years. What is planned for the next three years?

The chemistry department will be offering AS degree and CA in Analytical chemistry in future. Both programs is currently waiting for state approval.

7. Human, Technological, and Physical Resources (including equipment and facilities):

- Describe your current level of staff, including full-time and part-time faculty, classified staff, and other categories of employment.

Full-time faculty headcount 2

Part-time faculty headcount 5

Total FTEF faculty for the discipline, department, or program 4.52

Full-time/part-time faculty ratio 0.79

Classified staff headcount 0

- Describe your current utilization of facilities and equipment.
Chemistry classes are conducted in two laboratories: one room houses general chemistry and the other organic chemistry.

- What are your key staffing needs for the next three years? Why? Please provide evidence to support your request such as assessment data, student success data, enrollment data, and/or other factors.

1) Chemistry is badly in need of a full-time chemistry technician to take care of all preparations and setting up of all chemistry laboratory classes offered at BCC. Since spring 2014, the chemistry department offers 10 laboratory sections each semester (4 Chem 1A, 1 Chem 1B, 2 Chem 12 (A & B), 2 Chem 30A, and one Chem 30B). We are second to Laney College. While College of Alameda and Merritt College each offers 6 chemistry laboratory sections; yet, all those three colleges each have a full time chemistry technician.

A full time laboratory technician for BCC is not just a question of need, but it is a concern of **Safety in the Laboratory**. At the moment, the department relies solely on student workers to help prepare chemicals & solutions and set up all the laboratory classes. However, under OSHA's Laboratory Safety Guideline, student workers should only handle chemicals under the supervision by a chemistry instructor or a qualified laboratory technician.

Under the current situation, continuous supervision of student workers is impossible, because student workers and instructors do not have the same schedules where both can be in the laboratory together during preparation hours.

Most of the times our student assistants work in the chemistry laboratory during preparation without a proper supervision. Although we are aware that we are taking chances on their safety, we do not have any other alternative, because it is the only way the department can run all chemistry laboratory classes that we are offering.

Therefore, it is very, very important that the chemistry department get the full-time laboratory technician position ASAP.

2) Once we have a full time chemistry technician we will be able to expand our offerings, particularly for the classes in highest demand, Chem 1A and Chem 30A. Once we expand our offerings we will need a third full time chemistry instructor at BCC.

- What are your key technological needs for the next three years? Why? Please provide evidence to support your request such as assessment data, student success data, enrollment data, and/or other factors.

1) Computers for computational lab exercises in chemistry labs: Computational exercises, data acquisition and analysis are necessary to modern chemical lab curriculum. Section 4.3 from the American Chemical Society Guidelines for Chemistry in 2-Year Colleges (<http://www.acs.org/content/dam/acsorg/education/policies/twoyearcollege/acs-guidelines-for-chemistry-programs-in-two-year-colleges.pdf>) is included below.

4.3 Computational Capabilities and Software. Students should have access to computing facilities and software that support laboratory data acquisition and analysis, interactive simulations, and computational chemistry. Software with scientific word processing and illustration capabilities should be available.

- What are your key facilities needs for the next three years? Why? Please provide evidence to support your request such as assessment data, student success data, enrollment data, and/or other factors.

Classroom space for lecture: Chemistry 12A lectures are routinely conducted in room 514, the organic chemistry lab. Room 514 is configured as an organic chemistry lab. This configuration is

far from ideal for lecture sessions. We have mitigated the short fallings somewhat by bringing in a portable white board to increase whiteboard space, but the height of the benches and angles to the front of the class that students face make blind spots and limit the useful space for students to just a few seats in the front and center of the room. Access to additional lecture space is needed to provide functional environment for students in lecture situations.

8. Community, Institutional, and Professional Engagement and Partnerships:

- Discuss how faculty and staff have engaged in institutional efforts such as committees, presentations, and departmental activities. Please list the committees that full-time faculty participate in.

Chemistry faculties participate in institutional efforts in a variety of ways which include, but are not limited to: Technology committee, Facilities committee, Academic Senate, New Faculty Orientation.

- Discuss how faculty and staff have engaged in community activities, partnerships and/or collaborations.

Chemistry 12B faculty and students have initiated an outreach with UC Berkeley College of Chemistry. Each year students participate in a field trip to UC Berkeley. The students attend an organic chemistry, upper division lecture and lab classes, interact with undergraduate students, graduate students, and chemistry faculty. The goals of this partnership are to provide potential transfer students with a glimpse into student life at 4-year college, research opportunities in chemistry at 4-year colleges (both graduate and undergraduate), and career opportunities in science. One additional benefit that has come out of these field trips is a noted boost in students' self-esteem and knowledge that their educational experience at BCC is on par with the experience at a world-class university.

- Discuss how adjunct faculty members are included in departmental training, discussions, and decision-making.

Adjunct faculties participate in departmental meetings.

9. Professional Development:

- Please describe the professional development needs of your discipline or department. Include specifics such as training in the use of classroom technology, use of online resources, instructional methods, cultural sensitivity, faculty mentoring, etc.

1. Safety training for staff and faculty
2. Sabbaticals and monies for professional meetings

10. Disciple, Department or Program Goals and Activities:

- Briefly describe and discuss the discipline, department or program goals and activities for the next three years, including the rationale for setting these goals. NOTE: Progress in attaining these goals will be assessed in subsequent years through annual program updates (APUs).
 - 1) The Chemistry department will be offering AS Degree and CA in Analytical Chemistry in future years. Both programs are currently waiting for State approval.
 - 2) The department will work to improve retention and success rate, especially for Chem 1A from the current ~50% to 70% in the next 10 years. To accomplish this, the following steps will be taken:
 - (a) Working with other colleges in the district, the department intends to include Chem 30A, or its equivalent, as a pre-requisite for Chem 1A (in addition to Intermediate Algebra) to ensure that future students enrolled in Chem 1A will be better prepared. An alternative to this is students would be required to take and pass an Assessment Test, prepared by the Department and administered through the College Assessment Center, before they can enroll in Chem 1A. A standard assessment test will be created and prepared by representative faculties from all four colleges in the district.
 - (b) Before the beginning of each semester, students enrolled in Chem 1A would be required to attend a week of Chemistry Boot Camp where they will be taught some essential basic concepts in chemistry, such as naming chemicals, writing formulas, writing balanced equations, and basic chemical calculations.
 - (c) During the semester, the department will run weekly study/discussion sessions in which students at risk would be required to sign up. The size of each study/discussion group should not be larger than 20 students. The study/discussion sessions could be conducted by instructors or qualified tutors.

Items (b) and (c) will require special budgets from the college to pay instructors and tutors running the boot camps or study/discussion sessions. The amount of this funding can be worked out later.
- Then fill out the goal setting template included in Appendix B. which aligns your discipline, department or program goals to the college mission statement and goals and the PCCD strategic goals and institutional objectives.

- **Goal 1. Curriculum: Develop the lecture and laboratory experiments for Chemistry 10 (Analytical Chemistry)**

Activities and Rationale: Chemistry 18 is part of the new A.S. degree and Certificate of Achievement in Analytical Chemistry.

- **Goal 2. Assessment: Complete assessment for all chemistry classes.**

Activities and Rationale: Improve chemistry classes.

- **Goal 3. Instruction: One full time chemistry technician, one full time faculty position**

Activities and Rationale: A chemistry technician position is needed so that we can expand our chemistry offerings to meet the demand.

- **Goal 4. Student Success: Offer Chemistry Boot Camps, Discussion groups**

Activities and Rationale: To improve success in general chemistry (1A)

Goal 5. Professional Development, Community, Institutional and Professional Engagement and Partnerships: Continue serving on committees and working with UC Berkeley.

Activities and Rationale: Technology committee, Facilities committee, Academic Senate, New Faculty Orientation. Field trips to U.C. Berkeley's College of Chemistry inspire students to consider STEM careers.

Appendix A

Comprehensive Instructional Program Review Prioritized Resource Requests Summary

College: Berkeley City College

Discipline, Department or Program: Chemistry

Contact Person: Siraj Omar

Date: 11/01/2015

Resource Category	Description	Priority Ranking (1 – 5, etc.)	Estimated Cost	Justification (page # in the program review narrative report)
Human Resources: Faculty	Faculty: General Chemistry	3		There is a demand for additional sections of chemistry 1A and 30A. We are not able to accommodate additional sections at this time as we lack a chemistry technician. Once we have a technician we will need a 3 rd chemistry instructor
Human Resources: Classified	A full-time chemistry laboratory technician is badly needed for chemistry.	5	\$70,000 (p.a)	Chemistry is the second largest discipline in the science department. Chemistry now offers 10 lab sections and the need for a qualified full-time laboratory technician is very critical to take care of the preparation of all the laboratory classes and handling the inventory of chemicals and equipment. There is a lot pressure from the district that colleges increase the number of FTES in the coming semesters, and the BCC administration expects each department at BCC to add more sections in the sciences, including chemistry. However, without a full-time lab technician that would be a tall order for chemistry, even though there is a great demand for classes like Chem 1A and 30A. Our chemistry offering is unsustainable at the current level without a full time lab technician and cutting sections may become necessary. So far we have been lucky to have adequate numbers of qualified student workers, but we are not assured to continue on this lucky streak.
Human Resources: Student Workers	Student Workers for laboratory classes	5	\$23,320	<p>In addition to a full time technician, the chemistry department will need student workers to assist during the lab classes and to serve as tutors for Chem 1A and Chem 30A.</p> <p>40 hrs/wk x 35 weeks = 1400 + 360 hrs in summer = 1760</p> <p>1760 x 13.35 = \$23,320</p>

Technology	<ul style="list-style-type: none"> • A desk top computer for the science office to replace the current one that not working properly and unfixable. 	4	\$1,000	The existing desk top in the office is too old and not functioning properly.
	<ul style="list-style-type: none"> • 5 laptop computers for computational lab exercises in organic chemistry labs: 	4	\$5,000	Computational exercises, data acquisition and analysis are necessary to modern chemical lab curriculum.
			Total for desktop and Laptop = \$6,000	
Equipment	<ul style="list-style-type: none"> • An FT-IR spectrophotometer for organic lab 	5	\$38,500	Infrared spectrophotometer is essential for teaching organic chemistry. Currently the department is using an old IR model that is on loan from Laney College. The amount requested is for a one time use.
	<ul style="list-style-type: none"> • Magnetic stirrers (stir stations) from Vernier for general chemistry lab. 	4	\$3,500	These are needed to upgrade equipment in the general chemistry. The amount requested is for one time use.
	<ul style="list-style-type: none"> • LabQuests 	4	\$6,600	These are needed for all chemistry labs as a step to upgrade the lab.
	<ul style="list-style-type: none"> • 20 Glassware kits 	4	\$10,500	Necessary to improve lab safety and notebook management SLOs. Also required if any additional sections of 12A or B are to be offered.
			Total for equipment = \$59,100	
Supplies and Equipment Maintenance	<ul style="list-style-type: none"> • Chemicals 	5	\$7,500 p.a.	These are essential supplies to run lab classes. The amount requested is for each year.
	<ul style="list-style-type: none"> • Glassware and other consumable supplies, such as test-tubes, 	5	\$2,500 p.a.	These are consumables used in lab classes. The amount is for each year.

	<p>disposable plastic pipets, filter & chromatography papers, pH test strips, gas, etc.</p> <ul style="list-style-type: none"> • Whiteboard markers, erasers, stationaries, etc. • Equipment and fume hoods maintenance 	<p>5</p> <p>4</p>	<p>\$500 p.a.</p> <p>\$2,500 p.a.</p> <p>Total for supplies and equipment maintenance = \$13,000</p>	<p>The amount requested is for each year.</p> <p>To maintain all analytical equipment in organic chem lab and water de-ionizer are functioning properly and fume hood must be maintained annually</p>
Facilities	<ul style="list-style-type: none"> • More classroom space for lecture. 	5		<p>For the past 2 years Chem 12A lectures was and is conducted in room 514 (O-Chem lab). The lab is not designed for lectures – in addition from noise from fume hood ventilation system, sitting condition is uncomfortable. Every semester Chem 12A students have complained about the conditions of their lectures.</p>
Professional Development	Laboratory safety trainings for faculty, staffs, and student workers.	4		Laboratory technicians and student workers should get proper training on laboratory safety at least once every 2 years.
Other (specify)	One week of Chemistry Boot Camp Before semester begins and 12 weeks per semester of Discussion sessions for Chem 1A.	4	Total for running boot camp and discussion session = \$17,000 p.a.	To improve retention and success for Chem 1A. This course has suffered low retention and success due to poor preparation among many students enrolled in this class. One suggestion to remedy this is to run Chemistry Boot Camp one week prior to each semester and conduct weekly discussion sessions for students at risk to improve their chances of

				success in the class.
Total Requested			<p>Total one-time \$ requested for equipment & technology need = \$65,100</p> <p>Total \$ requested for human resources, chemicals, supplies and equipment maintenance = \$108,500 p.a.</p>	

Appendix B

PCCD Program Review Alignment of Goals Template

College: BCC

Discipline, Department or Program: Chemistry

Contact Person: Siraj Omar and Sam Gillette

Date: October 15, 2015

Discipline, Department or Program Goal	College Goal	PCCD Goal and Institutional Objective
<p>A. Goal 4. Student Success: Offer Chemistry Boot Camps, Discussion groups</p> <p>A.1, A.2, A.3, A.4, A.5</p> <p>Goal 4. Student Success: Offer Chemistry Boot Camps, Discussion groups</p>	<p>BCC Goal 1. Increase Equitable Access</p> <p>BCC Goal 2. Improve Equitable Success</p>	<p>Strategic Goals A: Advance Student Access, Equity, and Success</p> <p>2015-2016 Institutional Objectives A.1 Student Access: Increase enrollment for programs and course offerings in the essential areas of basic skills/ESOL, CTE and transfer to achieve the District target of 20, 609 RES FTES.</p> <p>A.2 Student Success: Using the total 2014-2015 data as a baseline, increase students' participation in SSSP eligible activities by at least 50%, with specific emphasis on expanding orientations, assessments, academic advising and student educational plans.</p> <p>A.3 Student Success: Fully implement an Early Alert process for all students.</p> <p>A.4 Student Equity: Address</p>

		<p>the achievement gap through fully implementing the student success and equity plans at each campus.</p> <p>A.5 Student Success: Using 2014-2015 data as a baseline, increase student engagement in activities such as student governance, student life activities, student leadership development, service learning programs, learning communities and student employment.</p>
<p>B.1, B.2</p> <p>Goal 5. Professional Development, Community, Institutional and Professional Engagement and Partnerships: Continue serving on committees, working with UC Berkeley, and collaborating with local biotechnological companies through the science advisory board.</p>	<p>BCC Goal 3. Increase the number of new partners and enhance and leverage resources with existing partners.</p>	<p>Strategic Goals:</p> <p>B: Engage and Leverage Partners 2015-2016 Institutional Objectives:</p> <p>B.1 Partnerships: Develop a District-wide database that represents our current strategic partnerships and relationships, both locally and abroad. Identify the individual responsible for this objective by October 1, 2015.</p> <p>B.2. Partnerships: Expand and document domestic and international partnerships with K-12 institutions, community based organizations, four-year institutions, local government, and regional industries and businesses.</p>
<ul style="list-style-type: none"> Goal 1. Curriculum: Develop the lecture and laboratory experiments for Chemistry 10 (Analytical Chemistry) 	<p>BCC Goal 4. Reduce education and achievement gap through building and implementing programs of distinction through SSSP, Equity, BSI and other college-wide plans.</p>	<p>Strategic Goals:</p> <p>C: Build Programs of Distinction 2015-2016 Institutional Objectives:</p> <p>C.1 Student Success: Develop a District-wide first year experience/student</p>

		<p>success program (such as Peralta Scholars).</p> <p>C.2 Student Success: Develop and fully implement an innovative student success program at each college that feeds into the District-wide first year experience/student success program.</p>
4.	<p>BCC Goal 5. Resolve the 2 ACCJC Recommendations and BCC's self-identified Actionable Improvement Plans</p>	<p>Strategic Goals:</p> <p>D: Strengthen Accountability, Innovation and Collaboration</p> <p>2015-2016 Institutional Objectives:</p> <p>D.1 Service Leadership: Provide professional development opportunities for faculty, staff and administrators that lead to better service to our students and colleagues and community partners.</p> <p>D.2 Institutional Leadership and Governance: Evaluate and update policies and administrative procedures, the overall PCCD organizational structure, and functional responsibilities within the District.</p> <p>D.3. Institutional Effectiveness: Evaluate and update the PBIM participatory governance structure and the Budget Allocation Model (BAM).</p> <p>D.4. Global Planning: Develop a Total Cost of Ownership (TCO) plan that includes agreed upon standards, estimates costs for facilities operations</p>

		<p>and maintenance, costs for technology acquisition, repair and replacement cycles, custodial and stationary engineering services for all existing buildings and potential new facilities</p>
<p>5.</p>	<p>BCC Goal 6. Increase BCC additional and alternative funding sources through materializing BAM, funding raising, non-RES tuition, grants, etc.</p>	<p>Strategic Goals: E: Develop and Manage Resources to Advance Our Mission 2015-2016 Institutional Objectives:</p> <p>E.1 FTES/FTEF Target: Achieve the District target FTES/FTEF within budget.</p> <p>E.2 Budget to Improve Student Success: Increase alternative funding sources including, but not limited to, the Peralta Colleges Foundation, non-RES tuition (with a particular focus on recruiting international students), grants, etc.</p> <p>E.3 Fiscal Oversight: Prudently manage all fiscal resources; general fund, bonds, benefits, OPEB), other long-term liabilities; Resolve all outstanding audit findings.</p> <p>E.4 Support Quality Instruction: Increase investments in materials, equipment, and teaching and learning resources to enhance student learning outcomes.</p>

Appendix C

Program Review Validation Form and Signature Page

College:

Discipline, Department or Program:

Part I. Overall Assessment of the Program Review Report

Review Criteria	Comments: Explanation if the box is not checked
<p><input type="checkbox"/></p> <p>1. The narrative information is complete and all elements of the program review are addressed.</p> <p><input type="checkbox"/></p> <p>2. The analysis of data is thorough.</p> <p><input type="checkbox"/></p> <p>3. Conclusions and recommendations are well-substantiated and relate to the analysis of the data.</p> <p><input type="checkbox"/></p> <p>4. Discipline, department or program planning goals are articulated in the report. The goals address noted areas of concern.</p> <p><input type="checkbox"/></p> <p>5. The resource requests are connected to the discipline, department or program planning goals and are aligned to the college goals.</p>	

Part II. Choose one of the Ratings Below and Follow the Instructions.

Rating	Instructions
<input type="checkbox"/> 1. Accepted.	1. Complete the signatures below and submit to the Vice President of Instruction.
<input type="checkbox"/> 2. Conditionally Accepted.	2. Provide commentary that indicates areas in the report that require improvement and return the report to the discipline, department or program chair with a timeline for resubmission to the validation chair.
<input type="checkbox"/> 3. Not Accepted.	3. Provide commentary that indicates areas in the report that require improvement and return the report to the discipline, department or program chair with instructions to revise. Notify the Dean and Vice President of Instruction of the non-accepted status.

Part III. Signatures

Validation Team Chair

_____ Signature _____ Date _____

Discipline, Department or Program Chair

_____ Signature _____ Date _____

Received by Vice President of Instruction

_____ Signature _____ Date _____

