

# The Comprehensive Instructional Program Review Report

## 1. College: Berkeley City College

**Discipline, Department or Program:** Biology

**Date:** November 1, 2015

**Members of the Comprehensive Instructional Program Review Team:**

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

### Goals of the Biology Department

The most important goal of the science department, in which biology 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 Biology Department:** The Biology Department offers the following transfer level courses for Biology Majors: General Biology (1A, 1B) and Microbiology (3) and the following non-major transfer courses: Introduction to Biology (10), Human Biology (25), Principles of Ecology and Ecology Lab (13, 13L), and the following courses specific to biotechnology but open to all students who have the necessary prerequisites: Scientific Literature (32), Applied Immunology (33), Applied Molecular Genetics (34), Introduction to the Biotechnology Laboratory (50A), Protein Chemistry and Fermentation (50B), Advanced Techniques (50C), Independent Research (49) and Workplace experience (COPED 484A).

**Goals of Students enrolled in Biology Courses:** Students enrolled in General Biology 1A and 1B are planning to transfer to 4-year colleges or universities. Students enrolled in Introductory Biology and Microbiology are planning to enter professional and graduate schools related to medicine, pharmacy, veterinary science, optometry, nursing and other allied health, and public health. Students enrolled in the biotechnology courses are mostly planning to enter the workforce immediately, although a few will transfer to 4-year schools and a few will proceed to professional and graduate schools. All transfer-level courses offered at BCC are taught at the same level of rigor as similar classes taught at those 4-year colleges and universities. This is to ensure that our students, once they transfer to any 4-year colleges or universities, are at a competitive edge with their classmates in those colleges or universities. There are evidences that show many of our science graduates have done very well in 4-year colleges and universities.

**The A.S. degree and Certificate Programs in Biotechnology:** BCC presently offers 4 programs in biotechnology. The A.S. degree in Biotechnology and the Certificate of Achievement in Biotechnology include courses in general biology, microbiology, immunology, genetics, instrumentation, scientific literature, bioethics, inorganic and organic chemistry and physics. The Certificate of Proficiency in Biotechnology has been restructured and streamlined to allow more students to gain the basic training needed for entry level laboratory assistant positions while at the same time establishing the preparation needed for entry into the more advanced certificate and A.S. degree program. Thus, the Certificate of Proficiency, Certificate of Achievement and the A.S. degree in Biotechnology have been designed to be stackable programs that allow students to start with few skills and progress to the more advanced skills and classes. A small college level certificate is awarded in Stem Cell Biology for those students completing a special internship along with either the A.S. degree or Certificate of Achievement in Biotechnology (see CIRM below). Several biotechnology classes are undergoing revision to meet four new California State course descriptors in biotechnology that can be used for transfer to CSUs offering 4-year degrees.

The biotechnology program at BCC has long attracted older students who are either returning to the workplace after a long absence or re-tooling for a new career in bioscience. Many students have bachelor and higher degrees in a range of fields, including the sciences, and some students are recent 4 year graduates. Among this latter group are students who felt that their college courses did not adequately prepare them for the demands of industrial and academic laboratories. In most cases, the problem appears to be a lack of adequate training in laboratory science coupled with a lack of exposure to technologies relevant to industry and research labs.

Graduates of the biotechnology programs have found employment in a range of specialties within the biotechnology industry including fermentation, manufacturing and quality assurance and quality control. Graduates have also been hired in research and clinical laboratories in both the public and private sector including the California Department of Health and Human Services, California Department of Justice (Forensics), the Lawrence Berkeley National Laboratory, the University of California at Berkeley and a number of local hospital laboratories.

### **Major Grants Awarded the Biology Department**

***California Institute of Regenerative Medicine (CIRM) Bridges Training Award.*** BCC Biotechnology Program has been awarded a \$3.4 million CIRM award that allows up to 10 students/year paid internships in research labs in Selected laboratories at UC San Francisco, UC Berkeley, and Children's Hospital Oakland, to name a few. There were 15 colleges awarded CIRM grants, 12 CSUs and 3 community colleges. BCC is the smallest college to receive this award. Students completing the CIRM internships receive a Certificate in Stem Cell Biology and complete either the A.S. in Biotechnology or the Certificate of Achievement. Of the 30 students who have finished the Stem Cell Program, 20% are enrolled in schools of medicine, pharmacy, or academic graduate programs, 47% are serving as laboratory technicians in industry and academic research labs, 20% are enrolled in 4 year schools, and the remaining are either completing coursework at BCC or have secured permanent positions in health related fields not involving stem cell work. Of the students serving as technicians, 43% remained in their internship laboratory; a number of these students plan to proceed to professional and academic programs in the near future.

***Design It! Build it! Ship it! High Impact Pathways Institutes:*** Originally established by Department of Labor TAACCCT funds, BCC bioscience faculty and staff are recipients of \$600,000 in TAACCCT funding in this robust regional (Napa to Hayward) community devoted to regional alignment of bioscience training with industry needs and developing pathways for student success. These monies have been used to revamp the Certificate of Proficiency and upgrade the equipment and experimental materials in all of the biotechnology classes. Also, the monies have supported development of a course in Bioinformatics with the possibility of creating a future Certificate of Achievement in this discipline.

**East Bay Career Pathways Consortium:** BCC faculty and staff, particularly in the area of Health and Bioscience, are partnered with 11 school districts, one charter school organization, six community colleges, a collaboration of four Workforce Investment Boards, two Regional Occupation Programs, the Alameda County Office of Education, business partners, and state-of-the-art technical assistance and professional development providers to reshape the East Bay K-14 educational system around four career pathways. The consortium's goal is to create a seamless transition from K-12 to community college that includes clear career and college pathways and work-based learning experiences with employer partners. Biology Department faculty are presently engaged in meetings with the high schools and workforce development agencies and plan to develop programs that link the local high schools with students at BCC.

**Other grant monies available to the Biology and Biotechnology programs:** Carl D. Perkins Career and Technical Education Improvement grants, Career Technical Education Enhancement Funds, Northern Alameda County Regional Consortium for Adult Education.

### ***Donations of Equipment and Supplies***

The Biology Department receives donated equipment and supplies from local biotechnology industries including Bayer, Clorox and Novartis. The Biology Department regularly visits the Bio Link Depot in San Francisco both to pick up supplies and equipment and to donate science department unused supplies and equipment. Bio Link has been a source of used and unwanted equipment and supplies from industries and research laboratories for high school and colleges for over 10 years.

## **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.*

Most courses were updated within the last 2 years, but there are two courses (Bio 33 and Bio 34) that are overdue for update. Both courses will be updated by the end of the Fall Semester 2015. Also, Bio 49, Independent Studies and COPED 484A, two courses utilized by a small group of students involved in a special internship program will be evaluated this Fall, 2015.

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

### **A. New courses**

1. Bioinformatics: 3-unit lecture only class that will be part of the biotechnology offerings. A Certificate of Achievement in Bioinformatics will be developed by Fall 2016.
2. Drug Development and Regulation: 2 unit lecture only class that will be part of the biotechnology offerings and will be aligned with the California State descriptor for students planning to complete B.S. degrees in Biotechnology.

### **B. Enhanced courses**

1. Biology classes, both the lecture and the laboratory sections, are continually updated with new information and experimental materials to keep abreast of current information and technology.
2. Biology 33 (Applied Immunology), 34 (Applied Molecular Genetics) will see new experimental protocols added to the laboratory classes.

- 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?

1. Certificate of Proficiency in Biotechnology
2. Certificate of Achievement in Biotechnology
3. Associate of Science in Biotechnology
4. Certificate of Stem Cell Biology (awarded by department for CIRM interns).

All of the certificates and degrees awarded include extensive laboratory training and as such there are no offerings in Distance Education.

#### 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
BIO 001A - General Biology	Y	Y					X		
BIO 001B - General Biology	Y	Y		X					
BIO 003 -Microbiology	Y	Y					X		
BIO 10 - Introduction to Biology	Y	Y				X			
BIO 13 - Principles of Ecology	Y	Y							
BIO 13L -Principles of Ecology Laboratory	Y	Y		X					
BIO 25 - Human Biology					X <sup>1</sup>				
BIO 32 - Scientific Literature	Y	Y					Y		
BIO 33 – Applied Immunology				X <sup>4</sup>					
BIO 34 – Applied Molecular Genetics				X <sup>2</sup>					
BIO 50A (230A) –Introd. to Biotechnology Lab	Y	Y							Y
BIO 50B (230B) Protein Chemistry & Fermentation	Y	Y					X		
BIO 50C – Advanced Techniques					X <sup>3</sup>				
BIO 49 – Independent Studies				X <sup>4</sup>					
COPED 484A – Workplace Experience	Y	Y		X <sup>4</sup>					

X<sup>1</sup> Course offered Spring semester only

X<sup>2</sup>: Has not been offered in recent years; presently offered F2015

X<sup>3</sup>: New Course

X<sup>4</sup>:Assessment has been delayed; will be completed Fall 2015

#### 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 the 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)
  - Course SLOs appear in the following locations:
    - Syllabi
    - Student Learning Outcomes webpage: <http://www.berkeleycitycollege.edu/wp/slo/student-learning-outcomes/>

- Program Learning Outcomes appear in the following locations:
  - College Catalog (printed and on the website [http://www.berkeleycitycollege.edu/bccdocs/BerkeleyCityCollege\\_2015\\_17Catalog.pdf](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 Task Stream for these findings.*

1. Bio 230A, Introduction to Biotechnology Laboratory, and Bio 230B (Protein Chemistry and Fermentation) have been re-structured substantially to reflect the true amount of time and effort the students were undertaking to learn the material presented in both the lecture and laboratory sessions. Both classes were originally 2 units: 1 hour of lecture and 1 hour of lab. These classes are now 3 units: 1.5 hours of lecture and 4.5 hours of lab and they have been re-numbered to Bio 50A and 50B starting spring 2016 to reflect college level work. Also, the contents of each class have been aligned with the California State descriptors for 2 biotechnology classes (Introductory Biotechnology with Laboratory and Methods in Protein Purification) that can be articulated with biotechnology programs offered at the CSUs.

Bio 230C (re-numbered Bio 50C starting spring, 2016), Advanced Techniques, was developed on the basis of input from students working in internships in research laboratories in the Bay Area. Students were asked to compile a list of methodologies and concepts that were new to them in their research laboratories as well as skill sets warranting more practice in their BCC classes. This class offers students exposure to and experience with the latest technologies in use in research laboratories.

2. The Certificate of Proficiency in Biotechnology and the A.S. in Biotechnology have undergone revision and update to reflect the current needs of industry and research laboratories.

3. Boot Camps and Discussion groups have been added for students enrolled in Biology 10, 230A and 3 in an effort to retain more students in these key ‘gateway’ classes. All 3 classes were witnessing high dropout rates and it was determined through questionnaires and individual discussions that often students felt lost due to a lack of understanding of a handful of key concepts, e.g. the metric system, graphing.

- *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.*

1. An AS-T degree in Biology will soon be available to students.

2. Structural changes to several courses in the biotechnology program will be undertaken to make the program more appealing to students planning to transfer to biotechnology programs at the CSUs.

Biology 33, Applied Immunology, and Biology 34, Applied Molecular Genetics are presently 6 unit courses: 4 units of lecture and 2 units of laboratory and in this format they are difficult to align with both the UC and the CSU system. In an effort to make these classes acceptable for transfer to 4 year schools, and to align them with California State descriptors for students majoring in biotechnology, the lecture and laboratory sections will be separated into two separate classes: Bio 33, 33L and Bio 34, 34L. The separation will also allow more flexibility in scheduling.

A hybrid component to Bio 32, Scientific Literature, will be added to make it more accessible to biotechnology students.

3. Bio 13, Principles of Ecology and Bio 13L, Principles of Ecology and Sustainable Systems Lab, are presently 2 separate classes and will be combined into one 4-unit class similar to many introductory science classes that offer 3 unit lecture and 1 unit lab classes.

- 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?

Presently 5 different faculties teach Biology 10, the only course in the Biology Department with multiple sections not taught by the same faculty. In the past, assessment of Biology 10 sections has shown similar results, however, assessment for Biology 10 will be conducted again in Fall 2016.

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

1. For the Biotechnology Programs, assessment of institutional level outcomes starts with keeping track of students post graduation to see how many gain employment or proceed to a 4 year or graduate professional or academic program.

2. While still in classes, assessment includes the ability of students to do the following (SLOs):

- a. Demonstrate a facility with laboratory mathematics and an ability to work aseptically, make solutions and buffers, follow scientific protocols, operate standard equipment, interpret and analyze results, trouble shoot, handle hazardous materials, and maintain a detailed laboratory notebook.

*ILOs: Communication, critical thinking, computational skills, information competency*

- b. Demonstrate an ability to understand and interpret scientific research papers, use scientific databases, construct scientific research papers and use presentation software.

*ILOs: Communication, critical thinking, information competency*

- c. Demonstrate general knowledge of key concepts and ethical issues, in the fields of biology, microbiology, immunology, molecular genetics and protein chemistry.

*ILOs: Communication, critical thinking, ethics and personal responsibility, information competency*

- d. Demonstrate ability to conduct scientific work as a member of a team and alone.

*ILOs: Communication, ethics and personal responsibility, self-awareness and interpersonal skills*

## 5. Instruction:

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

1. Biology boot camp: Prior to the commencement of classes and throughout the semester, students enrolled in Biology 10 are encouraged to attend boot camps where basic skills are reinforced.

2. 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 lecture reports and other assignments using turnitin.com have been used in some classes. This has provided students with streamlined grading and feedback while helping to ensure academic integrity using the site.

We have also used socrative.com to engage students in the lecture room. This has been effectively used lecture classes to test effectiveness of teaching key concepts.

Purchase of new laboratory equipment, e.g. nanodrop, qPCR, flow cytometer and i-blot speeds up data collection in the lab classes and allows students to spend more time learning the concepts. New equipment also introduces students to the latest technologies used in the workplace.

- *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 biology department. Academic standards are delineated in class syllabi and actively are reinforced in lecture and lab courses. With the exception of Bio 25 (Human Biology) and Bio 32 (Scientific Literature) courses currently offered at BCC have a laboratory component that allows 4 – 10 extra 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*

<b>COURSES</b>	<b>F2012</b>	<b>S2013</b>	<b>F2013</b>	<b>S2014</b>	<b>F2014</b>	<b>S2015</b>
BIO 001A - General Biology	57	61	67	67	61	50
BIO 001B - General Biology	28	34	37	41	44	45
BIO 003 -Microbiology	59	55	53	58	48	43
BIO 10 - Introduction to Biology	146	166	181	158	185	190
BIO 13 - Principles of Ecology	38	30	42	37	31	30
BIO 13L –Princ. of Ecology Laboratory	25	26	29	23	23	15
BIO 25 - Human Biology	---	46	---	43	---	60
BIO 32 - Scientific Literature	27	---	24	---	20	---
BIO 33 – Applied Immunology	---	25	---	19	---	17
BIO 34 – Applied Molecular Genetics	17	---	19	---	---	---
BIO 50A (230A) –Introd. to Biotech. Lab	22	25	14	14	22	15
BIO 50B (230B) Protein Chem.&Fermen.	---	15	---	13	---	12
BIO 50C – Advanced Techniques	---	---	---	---	---	8
BIO 49 – Independent Studies	7	2	4	5	5	5

*Not Offered = '---'*

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

The greatest student demand is for Biology 10 (Introduction to Biology). This course not only fulfills IGETC, Area 5, for students intending to transfer to a 4 year institutions, but it is also a requirement for nursing and allied health fields. Biology 10 is also a pre-requisite for the introductory biotechnology classes and thus a requirement for the Certificates of Proficiency and Achievement and the A.S. Degree in Biotechnology. Biology 10 is the equivalent of high school biology and as such it is attractive to high school students who want to proceed to A.P. Biology as well as high school students who need to re-take biology.

- *Productivity for the discipline, department, or program compared to that of the college.*

College's average productivity rate in the last 3 years is **18.05**.

Average productivity for biology: **19.49** and for Biotechnology: **11.97**

<b>COURSES</b>	<b>F2012</b>	<b>S2013</b>	<b>F2013</b>	<b>S2014</b>	<b>F2014</b>	<b>S2015</b>	<b>Mean</b>
BIO 001A - General Biology	20.36	21.79	17.33	13.93	21.79	12.14	17.89
BIO 001B - General Biology	16.73	19.62	12.81	23.65	15.71	10.68	16.53
BIO 003 -Microbiology	23.78	21.87	21.00	23.39	19.64	17.40	21.18
BIO 10 - Introduction to Biology	20.09	21.67	19.25	22.37	20.61	21.14	20.86
BIO 13 - Principles of Ecology	19.50	15.00	21.00	18.50	15.50	15.00	17.41
BIO 13L –Princ. of Ecology Laboratory	14.29	14.86	41.43	13.14	13.96	8.57	17.70
BIO 25 - Human Biology	---	23.00	---	21.50	---	30.00	24.83
BIO 32 - Scientific Literature	14.00	---	12.00	---	10.00		12.00
BIO 33 – Applied Immunology	---	14.20	---	23.75	---	21.25	19.73
BIO 34 – Applied Molecular Genetics	10.25	---	10.79	---	---	---	10.52
BIO 50A (230A) –Introd. to Biotech. Lab	14.70	14.70	8.23	8.23	3.95	8.82	9.77
BIO 50B (230B) Protein Chem.&Fermen.	---	8.82	---	7.65	---	7.06	7.84
BIO 50C – Advanced Techniques	---	---	---	---	---	---	---
BIO 49 – Independent Studies	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Not Offered = '---'*

- *Salient factors, if known, affecting the enrollment and productivity trends mentioned above.*

The average productivity for the biology classes is strong. The biotechnology classes cannot have more than 24 students and the advanced classes ideally should have 12-16 students maximum. Nonetheless, the low productivity rates need to be addressed with more attention to outreach and advertising.

- *Are courses scheduled in a manner that meets student needs and demands? How do you know?*

Yes, as much as is feasible given there are only 2 dedicated laboratory rooms. Every effort is made to offer Biology 10 each day of the week at different times (morning, afternoon and evening), with one section offered all day on Friday. We know this is meeting the needs of the students because all sections fill quickly. All biotechnology classes are offered in the evenings or on Fridays to accommodate working students. We have tried offering biotechnology classes in the mornings during the week and they do not fill.

- *Other Efforts related to Improving Student Learning*

Biology Department Faculty and Staff have written their own laboratory manuals and lecture readers and made them available to the students for substantially reduced cost compared to textbooks. The following has been accomplished:

Laboratory Manuals: Bio 1A, Bio 1B, Bio 10, Bio 230A, Bio 33 & 34 in progress

Lecture Readers: Bio 3

- *Recommendations and priorities.*
  1. Add one more Biology 10 section as the enrollments are above 30 in the other sections each semester and schedule MW mornings or evenings. Bio 10 is needed by all students planning on allied health careers.
  2. Rearrange the present Biology 1A offering to allow 2 labs to run concurrently (one in Room 522 and the other in Room 513 or 521) or offer the lab sections on either side of the lecture session. Presently two lab sections follow a lecture section and this making it too awkward for students to schedule their classes; in fact, many do not enroll at BCC once the earlier lab fills. If rescheduling the MW section of Bio 1A shows an increase in enrollments, plan to add a second section of Bio 1A on TTH mornings. Bio 1A is needed by all students majoring in the biological sciences.
  3. Complete Lab Manuals for Bio 33, 34 and 230B (50B)

## 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%**; mean course completion rate for biology: **78.1%**

Mean Biology Course Completion Rates Fall 2012 to Spring 2015

Course & number	Course Name	F2012	S2013	F2013	S2014	F2014	S2015	Mean
Bio 001A	General Biology	84.21	77.05	74.63	64.18	77.05	76.00	75.52
Bio 001B	General Biology	78.57	85.29	62.16	78.05	77.27	88.89	78.37
Bio 003	Microbiology	55.93	61.82	65.38	72.41	79.17	72.09	67.80
Bio 010	Introduction to Biology	69.86	77.11	71.82	79.11	80.54	74.21	75.44
Bio 013	Principles of Ecology	76.32	76.67	71.43	75.68	74.19	80.00	75.72
Bio 013L	Principles of Ecology Lab	72.00	76.92	75.86	73.91	78.26	86.67	77.27
Bio 025	Human Biology	---	71.74	---	88.37	---	66.33	74.48
Bio 032	Scientific Literature	48.15	---	66.67	---	80.00	---	73.30
Bio 033	Applied Immunology	---	76.00	---	78.95	---	94.12	83.02
Bio 034	Applied Molecular Genetics	70.59	---	47.34	---	---	---	58.98
Bio 230A	Introduction to Biotechnology	45.45	60.00	50.00	42.86	47.62	46.67	48.80
Bio 230B	Protein Chemistry & Fermentation	---	80.00	---	92.31	---	75.00	82.44
Bio 230C	Advanced Techniques	---	---	---	---	---	100	100
Bio 049	Independent Research	N/A						

Not Offered = ‘---’

## Discussion:

1. In general, students who have recently graduated from high school do not have adequate preparation in biology. An understanding of basic concepts such as cell structure and composition, genetics and evolution are sorely lacking among students entering the community college (as opposed to those proceeding directly to 4 year schools). Many of the students who are least prepared are coming from high school academies that stress ‘job readiness skills’ over basic academic work. Unfortunately, these students have been encouraged to enroll in BCC’s gateway class in biotechnology, Bio 230A and this is reflected in the low rate of completion. To correct this problem, a Certificate of Proficiency has been developed that requires students to complete English and Math courses along with Bio 10 and Chem 30A before they tackle Bio 230A (which will be Bio

50A starting Spring 2016). Also, Boot Camps and Study Sessions that cover the basic concepts in biology, lab math skills, generation and interpretation of graphs, and science terminology have been provided each semester in an effort to increase student success rates, particularly for at risk students in Bio 10 and Bio 230A.

2. Biology 3, Microbiology, has a fairly high attrition rate due to the lack of preparedness of students enrolled and the weak pre-requisites established for this course by the district. Presently, Chemistry 30A, Introduction to General Chemistry, is the only prerequisite. As a sub-discipline of biology, Biology 10 or Biology 1A should be included among the prerequisites along with Chemistry 30B, Introduction to Organic and Biochemistry. The latter chemistry class is critical for the laboratory section of microbiology. Students who have taken the suggested pre-requisites listed above have consistently performed well in microbiology. In an attempt to get higher completion rates among all student groups, a weekly Friday late afternoon discussion period and weekly Saturday open labs have been added starting Fall 2014. As a result of the added study sessions, student success rates averaged **75.63%** for the 2014-2015 academic year.
3. Bio 34, Applied Molecular Genetics, is presently being re-vamped to make it more accessible to students. Rather than two long lab sessions following the lecture session, a 3<sup>rd</sup> overflow lab session has been included on 6 Saturdays through the semester. Analysis of results after this semester will be conducted to see if the same structure would aid Bio 33 that is offered in the Spring.
4. **Course Success Rate by Course and Ethnicity: See Tables Page 16.** Other than the classes listed above, student success rates as a whole are strong, although sharp differences are seen between ethnic groups, in particular success rates for African American, Filipino and Hispanic students is lower than that of Asian and White Non-Hispanic groups. The data for the attached tables was collected 2012 – 2015 and as such it is not possible to determine the effectiveness of Boot Camps and Study Groups launched Fall 2014 on the improvement among students from at risk groups, including Black/African American, Filipino and Hispanic.

- *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 at this time.

- *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 Biology: **85.1%**

## Retention Rates F2012 – S2015

COURSES	F2012	S2013	F2013	S2014	F2014	S2015	Mean
BIO 001A - General Biology	91.23	86.89	85.07	65.67	78.69	76.00	80.59
BIO 001B - General Biology	82.14	88.24	75.68	87.80	81.82	95.56	85.21
BIO 003 -Microbiology	64.41	74.55	69.23	72.41	87.50	79.07	74.53
BIO 10 - Introduction to Biology	82.88	86.14	81.77	87.97	94.05	83.68	86.08
BIO 13 - Principles of Ecology	97.37	86.67	76.19	89.19	83.87	83.33	86.10
BIO 13L –Princ. of Ecology Laboratory	96.00	84.62	86.21	91.30	91.30	100	91.57
BIO 25 - Human Biology	---	78.26	---	93.02	---	75.00	82.09
BIO 32 - Scientific Literature	74.07	---	79.17	---	90.00	---	81.08
BIO 33 – Applied Immunology	---	80.00	---	84.20	---	94.12	86.11
BIO 34 – Applied Molecular Genetics	94.12	---	73.68	---	---	---	83.90
BIO 50A (230A) –Introd. to Biotech. Lab	86.36	68.00	64.29	57.14	71.43	86.67	72.31
BIO 50B (230B) Protein Chem.&Fermen.	---	80.00	---	92.31	---	75.00	82.44
BIO 50C – Advanced Techniques	---	---	---	---	---	100	100
BIO 49 – Independent Studies	100	100	100	100	100	100	100

*Not Offered = '---'*

**Discussion:** Retention rates are strong and well above the average for the college.

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

The following has been done to improve course completion and retention and will be continued for the next 3 years. **See Goal 4 page 15**

1. Developed Biology Boot Camps and Study Sessions to increase the success of students enrolled in Biology 10, Introduction to Biology, and Bio 230A, Introduction to Biotechnology. The boot camp is offered in the week before the start of the semester and the study sessions continue weekly throughout the semester.
2. Offered weekly structured 2-3 hour Friday discussion group sessions and 6 hour “Saturday Open Lab” sessions to increase the success of students enrolled in Biology 3, Microbiology.
3. Offered Science Informational Days at the start of each semester. During these events, each discipline within the sciences, certificates and degrees are explained and informational pamphlets provided. For biotechnology, prospective students are introduced to current students and learn about the research conducted by student interns working in laboratories at UC Berkeley, UC San Francisco and Children’s Hospital Oakland. Refreshments are provided and as many faculty as possible are encouraged to attend to assist students in planning their course load.
4. Supported Student Clubs: Engineering/Science and Medicine/Nursing are 2 clubs established recently by students to allow all those interested to come together and share experiences and serve as a support group. The clubs invite guest lecturers, offer field trips and group study sessions.
5. Offered two seminar series that present students with the latest areas of scientific endeavor. A “Noontime Seminar Series” emphasizes careers in STEM fields (e.g. medicine, engineering, environmental science, physics and computer systems) with guest speakers from local research and industry laboratories, and an Evening Seminar Series that emphasizes recent developments in science and medicine, including breakthroughs in stem cell biology and regenerative medicine.

6. Connected with local high school faculty in an effort to develop more effective pathways for students interested in STEM fields.
7. Participated in grant writing to generate monies to support Boot Camps and small group study sessions. Grant monies also allow for the purchase of more equipment and supplies that allow for smaller student groups in the laboratories. The monies also support some of the student workers and instructional aides in the classroom that in turn increases student success as they have more one on one instruction.

**Additional Future Plans**

1. Science Saturdays aimed at high school students interested in STEM fields. Presently in the planning stage, the idea is to engage high school students in activities that will give them the idea of the types of pathways in science they can pursue. A combination of activities and mini lectures that cover a breadth of science fields will be offered. This will be funded by the *East Bay Career Pathways Consortium (referred to as the Career Pathways Trust, CPT)*.
  2. Friday Science Assist Afternoons aimed at high school students taking science classes. Presently in the planning stage, the idea is to have high school students work directly with BCC students on homework problems and other matters to improve the retention of prospective science students in high schools. This will be funded by CPT.
- *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?*
    1. The greatest impediment to the number of certificates and degrees awarded is finding the time and money for someone to following through with every student who has completed the coursework to ensure that they file for the certificate or degree. Presently the new laboratory coordinator has taken on this task and hopefully the Biotechnology Program will have more graduates this coming year in its 2 Certificates and A.S. degree. See Table below for summary of degrees awarded.
    2. The Science Department has developed a Web page advertising all classes, degrees and internships available.
    3. Increase outreach to high schools to encourage graduates to consider BCC for the first 2 years of college and for the biotechnology offerings.

Year	A.S. Biotechnology	Certif. of Achievement	Certificate of Proficiency
2015	8	4	1
2013	6	6	N/A
2012	3	11	N/A

**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: **3**  
 Part-time faculty headcount: **5**  
 Total FTEF faculty for the discipline, department, or program: **5.35**  
 Full-time/part-time faculty ratio: **1.28**

Classified staff headcount **3**: 2 full time (biology technician and lab coordinator – oversees all science department needs) and 1 part-time.

- *Describe your current utilization of facilities and equipment.*  
Biology classes use 2 laboratory rooms exclusively: Room 522 and Room 513. Room 522 has been designated for Biology 1A and the biotechnology classes in an effort to keep it free of plants and other live material that can contaminate tissue culture used in advanced classes. At present the room is occupied full time between 8:30 a.m. and 10:00 p.m. Mondays and Wednesdays, 3:00 – 10:00 p.m. Tuesdays and Thursdays, and depending on the semester all day on Fridays through 7:00 p.m. There is space for a second 3 hour Biology 1A lab Tues Thurs mornings only. The Room is used almost every Saturday between 10 – 5 p.m. for molecular genetics (F), Immunology (Sp) and Microbiology (F, Sp). Room 513 is used for Biology 1B (plant biology) and Biology 10. The only available space to offer another section of Biology 10 in this room is Tuesday Thursday mornings. The room is used on Saturdays for Biology 13L.

Other rooms available to the Biology Department include a prep room, an instrument room and a storage room. The Biology Department maintains an inventory of all equipment, materials and supplies on line via Quartzy and in paper in the prep room. At present all drawers, cabinets and shelves are filled with materials in the two laboratory rooms, prep room and storage room for the science department.

The Biology department uses the following equipment on a daily basis: assorted microscopes, refrigerators and freezers, fume hoods, laminar flow hoods, autoclave, ice machine, water baths, deionizer, assorted spectrophotometers, thermocyclers, rockers, assorted centrifuges and pH meters. A flow cytometer is used in the spring semester for Bio 33 (immunology).

- *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. **Biology Faculty: 1 full time position.** This position would help support the teaching of all biology courses and the introductory biotechnology courses and support career pathways.
  2. **Student workers and Instructional Aides.** It must be emphasized that the presence of a full time biology technician does not eliminate the need for assistance in the laboratory classrooms. The role of the technician is to prepare all materials needed for each class and maintain the inventory. The role of the student workers and instructional aides is to assist the faculties with the laboratory class to ensure that students are conducting the experiments carefully and safely. Student workers and instructional aides do a minimal amount of set up and it is always under the supervision of the technician.

#### **SPECIFIC NEEDS FOR THE BIOLOGICAL SCIENCES**

- Student workers: 62 hrs/wk x 35 wks (2170 total hours) @ 13.25/hr = \$28,752.5/yr\*
- Summer Session: 310 hrs/session @ 13.25/hr = \$4107.5
- Sick Leave: 30 hrs work/1 hr sick leave = 2170 + 310 = 2480/30 = 82.7 x 13.25 = \$1095.8
- One 500 hr employees @ 16.19/hr = \$8,095/yr
- Sick Leave for 500 hr employee = 500/30 = 16.7 x 16.19 = \$270.4
- Approximate Total monies based on above/yr: **\$42,321**

\* *60 hrs/wk is in addition to the 8 hrs/wk that can be offered by the biology technician.*

3. **Dedicated Engineer Hours:** The science department and biology programs could use a dedicated engineer @ 5hrs/week to concentrate on the numerous equipment and operational problems that arise weekly throughout the semester. Presently, the engineer at BCC is responsible for the entire building and this when problems arise in the science department many repairs are put on hold complicating the ability of the staff to run laboratories.
4. **Administrative Assistant:** The science department and biology programs could use a part-time administrative assistant for 5 hrs/week. This position could be shared across disciplines.
5. **Web Page and Social Media Specialist:** The science department and biology programs could use a part-time web and social media specialist for 5 hours/week. This position could be shared across disciplines.

- *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. See Appendix A*

1. Laser printer for the office, \$500. Printer in office is over 12 years old and does not always work.
2. Ice machine (\$5000): present machine is unreliable
3. DNA sequencer (\$100,000) to support the advanced techniques class and ensure students are trained for the workplace in the latest technologies
4. Replacement of small equipment items (\$5000) that are too expensive to repair when broken
5. Materials and supplies, averages \$30,000/yr and supports entire science department.

- *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.*

1. Maintenance and Rental Agreements for autoclave, deionizer, ice machine, laminar flow hoods and rental monies for gas cylinders, approximately \$8500/yr.
2. Lighting in Room 431 (tiered classroom) needs improvement. Faculty in the sciences use this room for large classes and make extensive use of the white board, however, due to the poor lighting students cannot see what is written on half of each white board because the lighting is focused in the center of the room.
3. Office/Tutoring Space: The science faculty and staff could use an extra room for both office space and tutoring space. As the lab rooms are filled with classes the faculty can no longer make use of these rooms during their office hours.

## **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.*

Biology faculties participate in the college Academic Senate, Curriculum Committee, Staff Development Committee, CTE, Professional Day activities, outreach to high schools, and other all campus career days. Biotechnology faculties participate in the district Career Technical Education Committee and the Planning and Budget Committee (recently). Biology faculties (full time and adjunct) select speakers, develop and participate in two science seminar series: the Noontime Seminar Series that emphasizes career paths for students and the Evening Seminar Series that highlights the latest developments in medicine and science in the 21<sup>st</sup> century, along with other science related fields. Both series are open to the public and widely advertised in the community and throughout the district.

Biology faculties (full time and adjunct) participate in the Science Department Planning and Budget Committee that meets weekly on Wednesday afternoons. Biology faculties participate in the Science Advisory Board meetings held twice a year. The faculty had input into selecting scientists from the industry, academia and state and federal labs to serve on the advisory board.

- *Discuss how faculty and staff have engaged in community activities, partnerships and/or collaborations.* The Science Advisory Board is composed of local industry CEOs and scientists, local academic and clinical lab research scientists and technicians and members of the community.

As part of the Career Pathways Trust Effort, Science Faculties and Staff are making links with the local high schools, Adult schools, workplace development agencies and other educational groups in an effort to build pathways for students to STEM fields.

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

Adjunct faculties are included in the Science Advisory Board, Science Planning and Budget Committee, and Professional Day Meetings. All faculties participate in the selection of seminar speakers and topics for science department professional day meetings. Adjunct faculties participate in the Teaching Learning Center and have received a number of grants to develop FIGS, DARTS and APPLES.

Adjunct and full time faculties come together to design experimental materials for the laboratory exercises, design the content of the classes they teach, participate in the development of laboratory manuals and attend scientific meetings in their discipline.

### **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. **Faculty and Staff Safety Training:** should be arranged by the PCCD district

2. **Faculty Sabbaticals:** The concept of professional development needs to move beyond the use of classroom technology and the latest assortment of activities to ‘engage students in their own learning’ to consider the academic development of faculty. BCC has put considerable resources into improving teaching methods which has been great, however, nothing engages a student more than bright, energetic faculty on top of their subject and versed in the latest technologies. In this regard the present policy of the district to not provide adequate sabbatical leave for academic faculty is shameful. Science faculties desperately need time to keep abreast of the latest in their fields, to conduct research and to develop new experimental material for the classroom. Attendance at scientific meetings and workshops is fine, but does not replace conducting one’s own research.

Other needs include access to monies to attend professional meetings that occur outside of the academic year and which are often not advertised in advance. At present, the only way to be paid for these meetings is to submit a request in advance, but this is not always feasible. We would like to see monies made available to faculty after the meetings (and with appropriate travel and meeting receipts).

## 10. Discipline, 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).*
- **Goal 1. Curriculum: See Pages 3, 5-6. Develop two new courses: Drug Development and Regulation and Bioinformatics; establish AS-T in Biology, restructure Biotechnology classes and align with C-ID, restructure ecology, and add new experimental protocols to existing biology classes.**

Activities and Rationale: The 2 new courses will become part of the Biotechnology Program. The course in Drug Development and Regulation will satisfy the California State descriptor for such a course for students wanting to transfer to the CSUs to complete their Bachelor degrees, along with a new requirement for potential CIRM grant. The course in Bioinformatics will meet the proposed requirement for a Certificate in Bioinformatics outlined in the TAACCT grant proposal. The restructuring of the biotechnology classes will make it easier for articulation with 4-year schools and the new experimental protocols will ensure that students are exposed to the latest technologies in the workplace.

- **Goal 2. Assessment: See Table page 4. Complete Assessment for all Biotechnology Classes**  
Activities and Rationale: This assessment is long overdue for several classes including Bio 33, 34 and Bio 230B. An assessment of these classes will allow the faculties to improve the delivery of the material and offer support materials. This will increase student success and help to build programs of distinction.
- **Goal 3. Instruction: See Pages 8, 12-13. Add a section of Bio 10 & Bio 1A and complete laboratory manuals for Bio 33, 34 and 230B (50B). Hire tenure track faculty member, secure additional support from engineer, administrative assistant and web designer and social media specialist (latter positions shared across disciplines); secure funds for materials, supplies, equipment items, maintenance and rentals.**

Activities and Rationale: Bio 10 is required for allied health majors and is a gateway to biology and biotechnology majors. Bio 1A is needed by all biology majors. Lab manuals improve student comprehension of the material and can be provided at less cost to the student. Another biology faculty will be needed with increase in offerings and to develop career pathways for high school and college freshman. Additional staff support of engineer will ensure no breaks in instruction; assistance w/ administration, web page upkeep and social media are critical for advertising, smooth running department and grant applications. Monies are needed for laboratory room supplies and equipment upkeep.

- **Goal 4. Student Success: See Pages 10-11. Continue Boot Camps, Study Sessions, Open Labs, Seminar Series, Science Informational Days, and Student Science Clubs**

Activities and Rationale: Additional activities that will be developed through the CPT grant include 'Science Saturdays' and Friday Afternoon Science Assist. All of these activities will hopefully support student success and increase enthusiasm for the STEM fields.

- **Goal 5. Professional Development, Community, Institutional and Professional Engagement and Partnerships: See Pages 13-14. Continue with Advisory Board Meetings, Science Budget Committee, participation on Curriculum and other college and district activities.**

Activities and Rationale: Advisory Board Meetings helps to keep the Science Department offerings up to date and participation on other committees ensures that faculties are fully engaged with the college's goals.

# Additional Attachments

## Course Success Rate by Course and Ethnicity: % Success

SUBJECT	BIOL				
TERM	2012 – 2015				
Course	A	B	C	D	E
BIOL 10 - INTRO TO BIOLOGY	83.48%	62.31%	74.19%	67.16%	86.22%
BIOL 13 - PRIN OF ECOLOGY	90.91%	68.18%	87.50%	56.00%	82.43%
BIOL 13L - PRIN OF ECOLOGY LAB	87.50%	72.00%	60.00%	53.33%	90.63%
BIOL A - GENERAL BIOLOGY	86.11%	42.31%	80.00%	68.75%	81.48%
BIOL B - GENERAL BIOLOGY	78.38%	58.33%	42.86%	65.00%	87.01%
BIOL 230A - SCI INSTRUMENTATN I	40.91%	26.32%	75.00%	47.06%	68.97%
BIOL 230B - SCI INSTRUMENTATN II	75.00%	75.00%	50.00%	100.00%	85.71%
BIOL 25 - HUMAN BIOLOGY	65.52%	64.86%	33.33%	73.53%	86.89%
BIOL 3 - MICROBIOLOGY	69.12%	44.12%	35.71%	62.96%	74.59%
BIOL 32 - SCIENTIFIC LIT	90.00%	46.67%	66.67%	53.85%	72.22%
BIOL 33 - APPLIED IMMUNOLOGY	78.57%	71.43%	100.00%	85.71%	81.82%
BIOL 34 - MOLECULAR GENETICS	60.00%	33.33%	50.00%	50.00%	71.43%
BIOL 49 - I/S - BIOLOGICAL SCIENCES	100.00%	100.00%	100.00%	100.00%	100.00%
<b>Grand Total</b>	<b>80.03%</b>	<b>59.87%</b>	<b>65.59%</b>	<b>65.88%</b>	<b>82.75%</b>

## Numbers enrolled

BIOL 10 - INTRO TO BIOLOGY	225	200	31	201	283
BIOL 13 - PRIN OF ECOLOGY	33	66	8	25	76
BIOL 13L - PRIN OF ECOLOGY LAB	8	50	5	15	32
BIOL A - GENERAL BIOLOGY	144	26	10	48	135
BIOL B - GENERAL BIOLOGY	74	13	7	20	77
BIOL 230A - SCI INSTRUMENTATN I	23	20	4	17	30
BIOL 230B - SCI INSTRUMENTATN II	8	4	2	7	14
BIOL 25 - HUMAN BIOLOGY	30	37	3	34	61
BIOL 3 - MICROBIOLOGY	68	34	14	27	122
BIOL 32 - SCIENTIFIC LIT	10	16	3	13	18
BIOL 33 - APPLIED IMMUNOLOGY	14	7	3	7	22
BIOL 34 - MOLECULAR GENETICS	5	6	2	6	14
BIOL 49 - I/S - BIOLOGICAL SCIENCES	7	2	1	2	6
<b>Grand Total</b>	<b>649</b>	<b>481</b>	<b>93</b>	<b>422</b>	<b>890</b>

### Key:

Column A: Asian

Column B: Black/African American

Column C: Filipino

Column D: Hispanic

Column E: White Non-Hispanic

# Appendix A

## Comprehensive Instructional Program Review Prioritized Resource Requests Summary

**College:** Berkeley City College

**Discipline, Department or Program:** Biology

**Contact Person:** Barbara Des Rochers

**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	A full time Biology Instructor	5		<b>Goal 3 (page 12-13).</b> This position would help support the teaching of all biology courses and the introductory biotechnology courses.
Human Resources: Classified	Dedicated engineer for 5 hours/week	5		<b>Goal 3 (page 13).</b> Every week the science department, including the biology labs, experience equipment and structural failures that need immediate attention. If there was extra or dedicated time (w/monetary support) given the BCC engineer to concentrate on solving problems unique to the sciences our lab rooms classes would run more smoothly.
	Administrative Assistant	4		<b>Goal 3 (page 13).</b> The science department and biology programs could use a part-time administrative assistant for 5 hrs/week. This position could be shared across disciplines.
	Web Page and Social Media Specialist:	5		<b>Goal 3 (page 13).</b> The science department and biology programs could use a part-time web and social media specialist for 5 hrs/week. This position could be shared across disciplines.

<b>Human Resources: Student Workers</b>	Student workers and Instructional Aides in Lab Classes	5	\$42.321K	<b>Goal 3 (page 12).</b> Student workers and instructional aides are critical to assure student success in the laboratory classes and to ensure the safety of students. See Page 10 for details.
<b>Technology</b>	<ul style="list-style-type: none"> <li>Printer for Science Department Office</li> </ul>	5	0.5K	<b>See page 13.</b> The printer in the office is over 12 years old and not functioning properly.
<b>Equipment</b>	Ice Machine	5	5K	<b>See Page 13.</b> The present ice machine is not functioning properly and ice is needed daily by both the biology and chemistry laboratories.
	DNA sequencer	4	100K	<b>See Page 13.</b> For use in Bio 50C Advanced Techniques class, along with Bio 34, Molecular Biology
	Small Equipment Items (centrifuges, water baths, spectrophotometers)	4	5K	<b>See Page 13.</b> To replace items that breakdown each year and are too costly to repair.
<b>Supplies</b>	Materials and Supplies	5	30K	<p><b>See page 13.</b> Based on monies spent from several funds in past 2 years. This supports all biology and biotechnology classes (in part), along with other departments in the sciences.</p> <p>The special classes offered in the biotechnology program are further supported by grant monies with an average expenditure of \$14,000.</p>
<b>Facilities</b>	Maintenance and Rental agreements	5	\$8.5K	<b>See Page 13.</b> Includes maintenance of autoclave at \$3400/yr, deionizer at \$3500, microscopes, laminar flow hoods

	Lighting in Room 431 – tiered classroom		N/A	& rental of gas cylinders.  <b>See Page 13.</b> Lighting in tiered classroom is not adequate for board work. Lights need to be installed on the ends of the white boards (furthest from the center of the room)
	Office and Tutoring Space		N/A	<b>See page 13.</b> Need for more space/rooms for faculty, tutoring and office hours with white boards.
<b>Professional Development</b>	Faculty and Staff: Safety Training	5	N/A	<b>See page 14.</b> Also mentioned in the Chemistry Appendices. Laboratory technicians and student workers should get proper training on laboratory safety at least once every 2 years.
	Faculty: Sabbaticals	4	N/A	<b>See Page 14.</b> Sabbaticals allow science faculties to work in research areas that contribute to updating knowledge and understanding of latest technologies – which translates into improved and updated information passed on to students and student success in the workplace.
<b>Other (specify)</b>	Boot Camps, Study Sessions, Open Labs	5	\$5K	<b>Goal 4, pages 10-11.</b> To ensure student success it is critical to offer Boot Camps, study groups and open labs each week of the semester and during the summer.
	Advisory Board Meetings for STEM fields	5	\$1K	<b>Goal 5 page 14.</b> Food for 2 meetings/yr  For consideration: Recently, the

	<p>1.0 eq. hr./lab hour for faculty teaching Biology 1A, 1B, 3, 33, 34, 50A, 50B and 50C.</p>	4	<p>State has allotted monies to each college district to support 1.0 eq.hr/lab hr. for science classes and we would like to see this carried through at PCCD. In a number of college districts faculty teaching molecular based science classes (Bio 33, 34 and the 50 series) receive more than 1.0 eq. hr/lab hour due to the need to continually update material and long hours of lab preparation.</p>
	<p>Increase in Chair Release</p>	4	<p>For consideration: The Director of the Biotechnology Program teaches courses, overseas grants, and runs a program with 10% release time. This is not adequate. The Chairs of the Science Department teach challenging courses, oversee 7 disciplines, most with adjuncts that turnover, oversee laboratories with student workers and instructional aides, handle most of the decision making regarding purchases of equipment and supplies, maintenance requests, problems with broken or faulty equipment, student complaints and advising and faculty concerns, administrative matters on behalf of the department and split the release time for 15% each. This is not adequate.</p>

**Summary of known monies needed for Biology/Biotechnology Department:**

1. Annual support staff, small equipment and supplies: **\$87,321**
2. One time large equipment item (DNA sequencer): **\$110,000**

# Appendix B

## PCCD Program Review Alignment of Goals Template

**College:** BCC

**Discipline, Department or Program:** Biology

**Contact Person:** Barbara Des Rochers, Pieter de Haan

**Date:** November 1, 2015

Discipline, Department or Program Goal	College Goal	PCCD Goal and Institutional Objective
<p><b>Goal 3. Instruction: Complete Laboratory Manuals for Bio 33, 34 and 230B</b></p> <p><b>Goal 4. Student Success: Continue Boot Camps, Study Session, Open Labs</b></p> <p><b>Goal 2. Assessment: Complete Assessment for all Biotechnology Classes</b></p>	<p><b>BCC Goal 1. Increase Equitable Access</b></p> <p><b>BCC Goal 2. Improve Equitable Success</b></p>	<p>Strategic Goals <b>A: Advance Student Access, Equity, and Success</b></p> <p>2015-2016 Institutional Objectives</p> <p><b>A.1 Student Access:</b> 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><b>A.2 Student Success:</b> 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><b>A.3 Student Success:</b> Fully implement an Early Alert process for all students.</p> <p><b>A.4 Student Equity:</b> Address the achievement gap through fully</p>

		<p>implementing the student success and equity plans at each campus.</p> <p><b>A.5 Student Success:</b> 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>
<ul style="list-style-type: none"> <li><b>Goal 5. Professional Development, Community, Institutional and Professional Engagement and Partnerships: Continue with Advisory Board Meetings and Career Pathway Trust Activities outlined above.</b></li> </ul>	<p><b>BCC Goal 3. Increase the number of new partners and enhance and leverage resources with existing partners.</b></p>	<p>Strategic Goals:</p> <p><b>B: Engage and Leverage Partners</b> 2015-2016 Institutional Objectives:</p> <p><b>B.1 Partnerships:</b> 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>B.2. Partnerships:</b> 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"> <li><b>Goal 1. Curriculum: Develop two new courses: Drug Development and Regulation and Bioinformatics</b></li> </ul>	<p><b>BCC Goal 4. Reduce education and achievement gap through building and implementing programs of distinction through SSSP, Equity, BSI and other college-wide plans.</b></p>	<p>Strategic Goals:</p> <p><b>C: Build Programs of Distinction</b> 2015-2016 Institutional Objectives:</p> <p><b>C.1 Student Success:</b> Develop a District-wide first year experience/student success program (such as</p>

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

		<p>for technology acquisition, repair and replacement cycles, custodial and stationary engineering services for all existing buildings and potential new facilities.</p>
5.	<p><b>BCC Goal 6. Increase BCC additional and alternative funding sources through materializing BAM, funding raising, non-RES tuition, grants, etc.</b></p>	<p>Strategic Goals:  <b>E: Develop and Manage Resources to Advance Our Mission</b>  2015-2016 Institutional Objectives:</p> <p><b>E.1 FTES/FTEF Target:</b>  Achieve the District target FTES/FTEF within budget.</p> <p><b>E.2 Budget to Improve Student Success:</b>  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><b>E.3 Fiscal Oversight:</b>  Prudently manage all fiscal resources; general fund, bonds, benefits, OPEB), other long-term liabilities; Resolve all outstanding audit findings.</p> <p><b>E.4 Support Quality Instruction:</b> 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:

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### 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 \_\_\_\_\_