Biology and Natural History
PROGRAM REVIEW REPORT
2014 - 2015

Faculty and Staff (List all)

Full Time	Adjunct	Support Staff
Goedhart, Christine	Anderson-McGill, Taylor	Fausto, Monika
Goodman, Robert	Dery, Kenneth	McKinney, Kateri
Han, June	Gerrard, Amanda	Pagano, Chris
Juncosa, Barbara	Harfouche, Youssef	Terrazino, Michelle
Kondo, Arnold	Hollenshead, Marcia	
Hsin, Anson	Lee, Monica	
	Malik, Huma	
	McCabe, Dale	
	Saad, Nancy	
	Shimano, Brooke	
	Stepp-Bolling, Cassandra	
	Tsark, Eleanor	
	Van Leersum, Amanda	
	Villeneuve, Louisa	

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I. Executive Summary

Program Description:
These courses are designed for two different purposes, some for general education and others as introductory level courses required for such professional disciplines as biology, dentistry, forestry, optometry, medicine, registered nursing, veterinary medicine, and wildlife management. Students who intend to transfer as biology majors, or in majors closely related to biology, are advised to consult with a Citrus College counselor.

Strengths/Effective Practices:
The program has a commitment to full-time faculty presence in all courses and also to thoughtful assessment of SLOs. The program works diligently to collaborate with, and include, the adjunct faculty in assessment of SLOs and in course reflection and dialogue. The Biology 105 program provides equity in experience for all students due to these priorities. The program also benefits from the department commitment to outreach which has increased interest and enrollment in our program for students from our local feeder school districts. This outreach includes: Secrets of Science Summer Camp, Duarte High School Anatomy and Physiology Day, and faculty serving as Science Fair Judges for a variety of local elementary and middle schools. We have recently formed a partnership with the Pasadena Bioscience Collaborative (biotech incubator) to provide one day laboratory experiences for our biology majors. Our faculty are also involved in the Summer Research Experience Program, which places Citrus students at nearby 4-year institutions and bioscience companies to conduct research. Among the faculty, we host Faculty Inquiry Groups (FIGs), which promote discussion and innovation in teaching and learning techniques for all biology courses.

This fall 2014 we have re-activated our Biology 105 Honors and Natural History program to better serve students interested in these areas of study.

Weaknesses/Lessons Learned:
We have seen a staggering increase in demand for courses serving pre-allied health students and for those aimed at students intending to transfer as biology majors. As a result, the program has grown and cannot continue to support effective and high quality instruction without increased full-time faculty, lab support staff, and lab space. Based on current information, there is a mismatch between allocated laboratory space and the space needed to provide effective instruction. Furthermore, we are developing a bio manufacturing certificate program to train students who

wish to seek entry-level employment at local pharmaceutical and bioscience companies. The greatest challenge to implementing an effective workforce training program will be the lack of space to accommodate equipment and supplies to support our curriculum. Finally, we should develop a more cohesive relationship with our adjunct faculty members. This semester, around 50% of all FTES within the division are associated with adjunct faculty making them an integral component of our instructional program.

Recommendations/Next Steps:

We have several ongoing goals stemming from our 6-year program review that address challenges associated with the immense growth in our program. The Biology department has determined that two additional General Biology full-time tenured track positions are required to meet current demands and ensure that the program continues to run efficiently and effectively. As new goals for this year, we have added a commitment to increasing the Biology 105 offerings to support the allied health demand as well as graduation and transfer for all students. We plan to increase the frequency of course offerings for Biology 105, 124, 125, 145, 200, 201, and 220, which will require additional lecture and lab space through new construction or a remodel of existing facilities. Additionally, to meet student and curriculum demands, the department must increase the number of full-time laboratory technicians from 2 to 3.

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II. Curriculum

Course Number and Title (Courses must be reviewed every six years to remain active)	Date of last Curriculum Committee Review	2013-2014 Course offerings By Term and # of Sections				SLOs Assessed (Semester / year)
		Summer	Fall	Winter	Spring	
BIOL 100 Introductory Biology	**S07**	0	0	0	0	
BIOL 102 Human Genetics	**S08**	1	1	0	1	**Spring 2014**
BIOL 104 Biology: contemporary Topics	**S07**	3	6	3	8	**Spring 2014**
BIOL 105 General Biology	**S09**	6	45	9	45	**Spring 2014**
BIOL 109 Biology for Educators	**S09**	0	0	0	0	
BIOL 116 Aids: Insights and Implications	**S07**	0	0	1	0	**Winter 2014**
BIOL 124 Principles of Biology	**S09**	0	3	0	3	**Spring 2014**
BIOL 125 Principles of Biology II	**S09**	0	3	0	3	**Spring 2014**
BIOL 145 Environmental Science	**S07**	1	2	1	2	**Spring 2014**
BIOL 200 Human Anatomy	**S11**	3	5	3	5	**Spring 2014**
BIOL 201 Human Physiology	**S11**	0	5	0	5	**Spring 2014**
BIOL 220 Microbiology	**S11**	0	6	0	6	**Spring 2014**
BIOL 698ACooperative Education		**0**	**0**	**0**	**0**	
BIOL 698BCooperative Education		**0**	**0**	**0**	**0**	
BIOL 698CCooperative Education		**0**	**0**	**0**	**0**	
BIOL 698DCooperative Education		**0**	**0**	**0**	**0**	
BIOL 699ACooperative Education		**0**	**0**	**0**	**0**	
BIOL 699BCooperative Education		**0**	**0**	**0**	**0**	

BIOL 699CCooperative Education		**0**	**0**	**0**	**0**	
BIOL 699DCooperative Education		**0**	**0**	**0**	**0**	

III. Degrees and Certificates

Title	Type	Date Approved by Chancellor's Office	Number Awarded 2011	Number Awarded 2012	Number Awarded 2013	Number Awarded 2014
Biological and Physical Sciences (and Mathematics)	AS	1950	212	224	277	373
Liberal Arts: Math and Science	AA	2009	23	19	18	93
Biological Sciences	AS	2012		4	4	8

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

IV. Sections Offered

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

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

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

Total section counts in Biology have remained strong over the last several years despite the reductions in budgetary augmentation and student population across campus. For the last couple of years, in particular, section counts of Bio 124 and Bio 125 have doubled now that these classes are both offered every semester. We have a good distribution of morning, afternoon, evening , and now weekend sections allowing the department to provide coursework for a diversified student body. Even given these areas of expansion, more students are still waiting to add each semester. The department recommends that the number of core classes in Biology increase in the coming years to accommodate the increasing number of transfer students, both STEM and non-STEM, serviced by Citrus College.

In terms of success and retention, all classes show a retention rate of approximately 85-90% and a success rate of 65-75%.

V. Student Demographics

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

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

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

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

For all courses:

Average retention and success rates in all biology courses matched campus-wide rates (89% retention and 69% success) closely. Success rates need to be increased, but students who

successfully complete these courses often comment that the primary reason students fail to pass these courses is “student apathy”. Our successful students are driven and have positive comments about the learning environment and faculty.

For certain student populations (including “unknown” race/ethcnicity, Black and Hispanic/Latino), retention rates matched the program average but success rates were lower (approximately 59%). This may speak to the need for additional support services, such as SI, EOPS, and tutoring to be made available and easily accessible to these student groups.

VI. Student Accomplishments

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

- A number of students were selected, based on our recommendation, for paid summer research at Cal State Fullerton.
- Additional students were funded for summer research experiences (SRE) by the RACE to STEM grant at Cal Poly Pomona, Santa Ana Botanical Gardens (Claremont, CA), NASA's Jet Propulsion Lab, City of Hope, Chapman University, and Oak Crest Institute of Science (Pasadena, CA).
- One former student was accepted into medical school.
- A large number of students successfully transferred to four-year institutions.
- Top students were selected to participate in the paid Supplemental Instruction program at Citrus College, in which they mentor current students on successful study habits and aid students in their comprehension of biological concepts.
- One of our students was accepted into a Master's Program in Marine Biology and Ecology at James Cook University in Townsville, AU

VII. Student Learning Outcomes Assessment Reflection

Academic Senate Approved 4/11/12

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

Complete SLO assessment and analysis in the table at:
http://intranet/SLO/Pages/default.aspx

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

Examining the SLO data for the 2013-2014 academic year, it is evident that our instructional programs are having a positive impact on student learning and development. As a department, we strive to continually improve our pedagogical approaches for the diverse student population at Citrus College. We have seen the program grow tremendously in the recent years allowing us to reach a greater number of allied health, general education, and biology majors students. The SLO data generated in the past year indicate that our faculty successfully facilitate course completion for the vast majority of students. Clearly, great care is taken in designing and

implementing thoughtful assessments of learning goals. As a department, we have recognized, however, that sustaining these learning gains will require additional faculty hiring to ensure that we are available to our students while tending to administrative tasks associated with such a large program.

For our Biology 105 General Biology for non-majors course, our SLO data for the past year shows that over 75% of students are able to both "acquire data utilizing a variety of scientific instrumentation and laboratory techniques" and "examine the impact of human activities have had on the environment and apply and apply an understanding of biological processes to current events and citizenship". We were satisfied with students' level of understanding on these two outcomes but still made adjustments based on the assessment analysis. In terms of utilizing scientific instrumentation, our SLOA data led us to acquire new spectrophotometer machines to better aid student reading of data. For the second outcome of "examining the impact of human activities on the environment," we found that students' ability to discuss this impact was improved by offering a worksheet on the topic in addition to lecturing. Providing more resources, such as the worksheet, to students may help improve their learning and applying of the material.

SLO were also assessed in all the other biology classes and students showed adequate acquisition of outcomes. Some other lessons were learned from SLOA in Bio 200. Students during winter intersession scored higher on the SLO assessment than spring semester students. While this trend is commonly observed and is attributed in part to some differences in student groups that participate in different semesters, it also led the instructor to think about different ways to pace the material during the spring semester to help students better retain material like they do in winter. SLOA in Bio 220 prompted the instructor of that course to examine how better to include the textbook in and out of class.

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VIII. Progress toward previous goals

During 2013-2014, we accomplished:

	Previous Goals	Progress/ Persons Responsible	Status	Institutional Goal
Goal 1 **2013-14**	Statewide budget cuts will have a dramatic impact on all campus activities. As funds are restored, additional full-time faculty positions should be filled (one of our full-time faculty has assumed the position of Dean, and this position needs to be filled). The department has also seen a significant growth in course offerings. According to the most recent FTE numbers the program should be increased by at least two faculty (the program currently has 5.5 full-time faculty).	We have hired one full-time faculty for our Majors Program.	C	1.1, 1.2, 2.2, 2.3, 3.1
Goal 2 **2008-09**	The program has significantly expanded course offerings and lab technical support has not grown at the same rate. The program currently has one full-time and two 49% lab technician positions. In order to maintain our current offerings or to grow, the program needs to have an additional full-time lab technician.	Currently under discussion/Persons Responsible: Rabitoy/McKinney/all full-time faculty.	P	1.1, 1.2, 3.1
Goal 3 **2012-13**	Based upon current FTES and recent resignations, the departments needs two full-time General Biology faculty	Submit FNIC requests in Fall 2014 for two full-time faculty positions	P	1.1, 1.2, 2.2, 3.1

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

	Description	Actions / Target Date	Institutional Goal**
Goal 1	Restore SI for B200, B201, and B220	Remove district hiring policy restrictions for SI leaders	1.1, 1.2, 2.2, 2.3, 6.1, EFMP2
Goal 2	Develop a biotechnology certificate training program to prepare students for entry-level positions at local pharmaceutical and bioscience companies.	Develop curriculum and guide through the approval process in 2014-2015. Acquire necessary equipment.	1.1, 1.2, 2.2, 6.1, EFMP4, EFMP5

**For instutional goals visit link below.*
http://www.citruscollege.edu/admin/planning/Documents/StrategicPlan2011-2016.pdf

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

EFMP 1 – Increase the number and broaden the types of course offerings to meet institutional mission and student demand for transfer and career preparation in the discipline of biology.
EFMP 2 – Institutionalize the use of supplemental instruction to enhance student learning and success in biology courses.
EFMP 3 – Institutionalize the outreach programs to local schools, being piloted in the STEM grant, to bring more elementary, middle, and high school students to view the science and math programs.
EFMP 4 – Create a career technical education program to offer an associate degree in biotechnology.
EFMP 5 – Increase the utilization of technology, such as video conferencing and virtual laboratory experience.

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IX. Budget Recommendations for 2014 - 2015

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

Certificated Personnel (FNIC)

Position	Discuss impact on goals / SLOs	Impact	Priority
2 – General Biology	Will improve achievement of all goals/SLOs	M, N, Q, F	2, 3

Classified Personnel

Position	Discuss impact on goals / SLOs	Impact	Priority
1 – Full time lab tech Bio	Will improve achievement of all goals/SLOs	M, N, Q, F, C	2, 3

Staff Development (Division)

Item	Discuss impact on goals / SLOs	Cost	Impact	Priority

Facilities (Facilities)

Describe repairs or modifications needed	Discuss impact on goals / SLOs	Building / Room	Impact	Priority
Additional laboratory and lecture space (new building)	To accommodate increase in course demand, allocate space to the new biotechnology training program, and provide students with safe learning environments (particularly for laboratory courses)		Q, M, N, F	2, 3
Repair/Replace vacuum system for LS building	To ensure that our new biotechnology curriculum meets the training needs identified by our industry partners, the vacuum system in the LS laboratories must be repaired or replaced for student activities	LS	Q, M, N, F	2, 3

Computers / Software (Tecs)

Item	Discuss impact on goals / SLOs	Cost	Impact	Priority
4 Tablets for Stockroom staff	Increase efficiency in lab set up, preparation, cleaning, and safety due to	$6,200	Q, M, N, F	2, 3

	increased workflow associated with expansion in course offerings.			

Equipment

Item	Discuss impact on goals / SLOs	Cost	Impact	Priority
10 Proclave media autoclave	Increase capacity for preparing microbiological media. Reduce the time required for technicians to pour plates for student activities.	32,400	Q, M, N, F	2
3 DNA Model Kits (6 complete models)	Improvement of classroom instruction across all biology courses by providing hands-on models of DNA in lecture halls and laboratories	1,610	Q, M, N, F	2, 3
Wireless internet access to PS107 (which will include PS103 and 121)	Provide wireless internet access to improve classroom instruction for BIOL124 and BIOL125	7,000	Q, M, N, F	2, 3
Ultrasonicator	Allow for cell lysis and lipid extraction within the honors biology inquiry-based lab	5,000	Q, M, N, F	2
6 pH meters	Provide equipment to increase the efficacy and research potential of the honors biology inquiry-based lab	600	Q, M, N, F	2
24 Scientific Calculators	Provide calculators in microbiological labs to avoid contamination of student property	260	Q, M, N, F	2, 3
1 Laboratory Refrigerator	Provide additional storage space for microbiological supplies and reagents; Current refrigerator/freezer combination leaves too little space for biological media to meet the needs of the existing program	2,740	Q, M, N, F	2
2 Vortexers for mixing of bacterial samples	Improvement of laboratory instruction for microbiology	600	Q, M, N, F	2, 3
10 Spare classroom projectors to be used campus-wide	Improvement of classroom instruction	12,000	Q, M, N, F	2
4 spare Crestron controllers to be used in podium systems campus-wide	Improvement of classroom instruction	16,000	Q, M, N, F	2

Supplies (Division)

Item	Discuss impact on goals / SLOs	Cost	Impact	Priority

General Budget Guidelines

Budget Preparation Tips:

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

Determining Budget Impact:

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

M = Mission: Does the request assist the program in meeting the District's mission and established core competencies and / or diversity?
N = Need: Does the request assist the program in addressing needs based on labor market data, enrollment, articulation, advisory committee, regional agreements, etc.?
Q = Quality: Does the request assist the program in continuing or establishing appropriate lecture/lab unit values? Will the request assist in the regular reviewed / updated of course outlines? Is faculty development adequate? Does program need support in addressing the State and District emphasis on critical thinking, problem solving and written expression? Does program need support to meet stated objectives in the form of SLOs? Do course pre-requisites and co-requisites need to be validated?
F = Feasibility: Does the request assist the program maintain adequate facilities, equipment, and library resources? Is there a need for repair or modification of facilities? Is there a need for new equipment or supplies? Are course offerings frequent enough for students to make adequate progress in both day and evening programs? Does the program have adequate communication with & support from Counseling?
C = Compliance: Does the request assist the program in meeting Federal, State & District requirements? (Do the course outlines meet state, district & federal regulations for content? Do vocational programs have regular advisory meetings?)

Budget Priorities:

When establishing priority, consider the following:

Priority 1: This item is mandated by law, rule, or district policy.
Priority 2: This item is essential to program success.
Priority 3: This item is necessary to maintain / improve program student learning outcomes.