

# Biological Sciences (Anatomy, Biology, Biotechnology, Microbiology, Physiology) Program Review

## 2012-2013

### 1. Program/Department Description

#### **1A. Description**

The Biological Sciences curriculum provides a foundation for further study and careers in multiple fields within the life sciences. Our generalized courses give students majoring in other subjects a broad and comprehensive experience in biology. Our specialized courses serve students transferring to four-year, graduate, or professional schools; upon transfer, these students will be prepared for further study in a variety of disciplines, including but not limited to Botany, Cell/Molecular Biology, Ecology, Health Sciences, Marine Biology, Pharmacology, and Zoology. Many of our courses also provide essential skills to students completing our Biotechnology program. Subsequent careers in biotechnology, dentistry, medicine, nursing, research, teaching, among others, all rely on a strong background in the Biological Sciences.

#### **Degrees/Certificates**

Program's courses are designed to articulate to UC and CSU for transfer students.

Associate in Arts Degree: Biological Sciences

Certificate of Achievement: Biological Sciences

Associate in Sciences Degree: Biological Sciences (Biotechnology or Plant Biotechnology Option)

Certificate of Achievement: Biological Sciences (Biotechnology or Plant Biotechnology Option)

Proficiency Award: Biotechnician

#### **1B. 2012-2013 Estimated Costs (Certificate of Achievement ONLY)**

*Required for Gainful Employment regulations.*

CA w/ AA	Cost	CA w/ AS	Cost		Cost		Cost
Enrollment Fees	\$1610	Enrollment Fees	\$1196				
Books/Supplies	Estimated \$1050-\$1400	Books/Supplies	Estimated \$900-\$1200				
Total	Estimated \$2660-\$3010	Total	Estimated \$2096-\$2396	Total		Total	

#### **1C. Criteria Used for Admission**

Open admission with no prerequisites.

#### **1D. College Vision**

Ventura College will be a model community college known for enhancing the lives and economic futures of its students and the community.

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### **1E. College Mission**

Ventura College, one of the oldest comprehensive community colleges in California, provides a positive and accessible learning environment that is responsive to the needs of a highly diverse student body through a varied selection of disciplines, learning approaches and teaching methods including traditional classroom instruction, distance education, experiential learning, and co-curricular activities. It offers courses in basic skills; programs for students seeking an associate degree, certificate or license for job placement and advancement; curricula for students planning to transfer; and training programs to meet worker and employee needs. It is a leader in providing instruction and support for students with disabilities. With its commitment to workforce development in support of the State and region's economic viability, Ventura College takes pride in creating transfer, career technical and continuing education opportunities that promote success, develop students to their full potential, create lifelong learners, enhance personal growth and life enrichment and foster positive values for successful living and membership in a multicultural society. The College is committed to continual assessment of learning outcomes in order to maintain high quality courses and programs. Originally landscaped to be an arboretum, the College has a beautiful, park-like campus that serves as a vital community resource.

### **1F. College Core Commitments**

Ventura College is dedicated to following a set of enduring Core Commitments that shall guide it through changing times and give rise to its Vision, Mission and Goals.

- Student Success
- Respect
- Integrity
- Quality
- Collegiality
- Access
- Innovation
- Diversity
- Service
- Collaboration
- Sustainability
- Continuous Improvement

### **1G. Program/Department Significant Events (Strengths and Successes)**

The Biological Sciences curriculum provides a foundation for further study and careers in multiple fields within the life sciences. Many of our students successfully transfer to 4-year universities and professional programs, others, particularly those in the biotechnology programs, use the classes to help them achieve employment.

Ventura College's Biology Department started in 1955 with 2 members, Orley (Casey) Casella and Philander (Phil) Powers. Other full-time members have included Thomas (Tom) O'Neill, Donald (Don) Villaneuve, Bob Green, Jack Farrell, Jim Castren, Fred Lotter, Thor Willsrud, William (Bill) Fox, George Arita, Ann Colvin Redding, and William (Bill) Thieman. Current full-time members are Kamelia

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(Kammy) Algiers, Marta de Jesus, Robert (Robbie) Haines, Terry Pardee, and most recently, Ty Gardner in 2009.

In 1995, Bill Thieman started the biotechnology program, the first in the county, with the aid of a grant from the Hansen Foundation. He received a number of national (NSF, USDA, and Perkins) grants and California Community Colleges Chancellor's Office Grants (Fund for Student Success, Tech Prep) used to further develop the on-campus biotechnology program, and to build articulation/transfer projects with local high schools and universities in a variety of biology-related areas (Agricultural Science & Natural Resources Transfer Career Programs, Biotechnology Program, Environmental Science Programs, GIS Agri-Science Program, High School Science Teacher Training Matriculation Project). Bill has received several awards for his pioneering efforts including the Council for Resource Development (CRD) 2007 Campus Impact Award for Outstanding Non-Development Professional (national) and 2 California Community Colleges Student Success Awards in 1997 and 2001. VC's biotechnology program has benefited from donations (equipment and supplies) and liaisons with local biotechnology-related entities and individuals, and the presence since 1997 on-campus of the director of the statewide Economic and Workforce Development Network's (now Cal ABC's) biotechnology effort and the Central Coast Biotechnology Center (CCBC) due to the efforts of then Dean Robert Renger. Several VCCCD faculty and one manager have served as either the state-wide director and/or as the director of the CCBC (Robert Renger, Bill Thieman, Mary Pat Huxley, James Harber and Patricia Fausset). These grant-funded entities supplied local schools with biotechnology-related teaching materials for many years. This outreach effort led to many positive relationships with the teachers and high schools of the county. At present, the office of the state-wide director has been moved to American River College and the CCBC has been closed. The activities and opportunities these offices facilitated are generally missed. A small amount of local outreach to local high schools is still performed by the involvement of one faculty member in Pierce College's Amgen Kits project.

In 2005, Biology and Chemistry merged administratively, both departments had only 2 full-time faculty each, and shared a department chair (David Oliver). After hiring one more faculty member and when Prof. Oliver became Dean of the Math Sciences Division, Biology and Chemistry re-separated. In 2007, Anthropology joined Biology to form a larger department in life sciences at Ventura College. The Biology Department has been involved in collaborative ventures with CSUCI and UCSB. These have included selecting and mentoring students who were potential future teachers (with the UCSB Math Department's California Mathematics and Science Teaching Program which was partly funded by the University of California's Community Teaching Fellowship Program and by the NSF-funded California Alliance for Minority Participation), developing a new general education class on stem cells (BIOL/BIOT V42) for CSUCI's 2009 California Institute for Regenerative Medicine (CIRM) grant, and involvement in Ventura College's recent (2008-10) STEM grant from the Dept. of Education. We've recently heard that we have been included as participants in a new STEM grant awarded to CSUCI this year and our participation at this time is predominantly in articulation discussions.

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K. Organizational Structure

President: Robin Calote

Executive Vice President: Ramiro Sanchez

Dean: Dan Kumpf (Interim Dean)

Department Chair: Terry Pardee

Instructors and Staff

Full-Time Instructors

<b>Name</b>	<b>Kamelia Algiers</b>
Classification	Associate Professor
Year Hired	2006
Years of Work-Related Experience	
Degrees/Credentials	B.A. Biology, M.S. Biology

<b>Name</b>	<b>Marta de Jesus</b>
Classification	Professor
Year Hired	1996
Years of Work-Related Experience	Lab technician 3 yr, Postdoctoral research scholar 5 yr
Degrees/Credentials	B.S. Chemistry, C.Phil. Biology, Ph.D. Biology

<b>Name</b>	<b>Ty Gardner</b>
Classification	Assistant Professor
Year Hired	2009
Years of Work-Related Experience	
Degrees/Credentials	B.S. Wildlife Science, M.S. Biology

<b>Name</b>	<b>Robert Haines</b>
Classification	Associate Professor
Year Hired	2007
Years of Work-Related Experience	
Degrees/Credentials	B.A. Biology, M.A. Molecular, Cellular, and Developmental Biology

<b>Name</b>	<b>Terry Pardee</b>
Classification	Professor
Year Hired	1996
Years of Work-Related Experience	Protein Chemistry Research, Amgen, Inc. 2 yrs
Degrees/Credentials	B.S. Biology, M.S. Biology, Ph.D. Epidemiology

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Part-Time Instructors

<b>Name</b>	<b>Eden Bellenson</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	1999
<b>Degrees/Credentials</b>	B.S. Animal Science, M.S. Biological Sciences, MLS (ASCP)

<b>Name</b>	<b>Angela Chapman Kofron</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	2008
<b>Degrees/Credentials</b>	Ph.D. Ecology

<b>Name</b>	<b>Elizabeth (Elzbet) Diaz de Leon</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	1991
<b>Degrees/Credentials</b>	Masters Marine Science, Life Science CC Credential

<b>Name</b>	<b>Patricia Fausset</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	2005 (Chemistry), 2010 (Biotechnology)
<b>Years of Work-Related Experience</b>	11 yr
<b>Degrees/Credentials</b>	Bachelors Chemistry, Masters Biochemistry

<b>Name</b>	<b>Suvi F. Flagan</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	2008
<b>Degrees/Credentials</b>	B.S. Environmental Science and Engineering, M.S. Microbiology, M.S. Marine Science

<b>Name</b>	<b>Steve Gadbois</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	1977
<b>Degrees/Credentials</b>	B.A. Biological Sciences, M.A. Biological Sciences, California Community College Instructor Credential

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<b>Name</b>	William Hewson
<b>Classification</b>	Adjunct Instructor
<b>Year Hired</b>	2012
<b>Degrees/Credentials</b>	M.S. Biology

<b>Name</b>	<b>Mary Pat Huxley</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	1987
<b>Degrees/Credentials</b>	Lifetime CCC Credential in Biological Sciences and Agriculture. B.A. Biology; M.Sc. Genetics, Ed.D. Organization Change

<b>Name</b>	<b>Kim Jesu</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	
<b>Degrees/Credentials</b>	Masters

<b>Name</b>	<b>Keith Johnson</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	1990
<b>Degrees/Credentials</b>	DDS

<b>Name</b>	Michelle Kim Le
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	2012
<b>Degrees/Credentials</b>	M.S. Biology

<b>Name</b>	<b>Ernest (Ernie) E. Lory</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	1976
<b>Degrees/Credentials</b>	B.A. Biology with emphasis in microbiology, M.A Biology with emphasis in microbiology

<b>Name</b>	<b>Michael (Mike) Riddle</b>
<b>Classification</b>	Adjunct Professor (Professor Emeritus - Southwest College)
<b>Year Hired</b>	
<b>Degrees/Credentials</b>	AA Biology (VC), Masters

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<b>Name</b>	<b>Patty Saito</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	2008
<b>Degrees/Credentials</b>	M.A. Biology

<b>Name</b>	<b>Bryan Swig</b>
<b>Classification</b>	Adjunct Professor
<b>Year Hired</b>	2006
<b>Degrees/Credentials</b>	Ph.D. Biology

<b>Name</b>	<b>William J. Thieman</b>
<b>Classification</b>	Professor Emeritus
<b>Year Hired</b>	1970
<b>Degrees/Credentials</b>	M.A. Zoology, CCC teaching credential (Biology), Administrative Credential

Technical Staff

<b>Name</b>	<b>Sheena Billock</b>
<b>Classification</b>	Instructional Laboratory Technician II
<b>Year Hired</b>	2008
<b>Years of Work-Related Experience</b>	5 years as Research Technician, 4 years as Instructional Laboratory Technician
<b>Degrees/Credentials</b>	B.S. Biology, M.S. Biology

<b>Name</b>	<b>Will Smith</b>
<b>Classification</b>	Instructional Laboratory Technician II
<b>Year Hired</b>	2003
<b>Years of Work-Related Experience</b>	9 years Instructional Laboratory Technician
<b>Degrees/Credentials</b>	B.S. Biology

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**2. Performance Expectations**

**2A. Student Learning Outcomes**

**2A1. 2012-2013 - *Institutional* Student Learning Outcomes**

1. Communication - written, oral and visual
2. Reasoning - scientific and quantitative
3. Critical thinking and problem solving
4. Information literacy
5. Personal/community awareness and academic/career responsibilities

**2A2. 2012-2013 - *Program* Level Student Learning Outcomes**

***For programs/departments offering degrees and/or certificates***

1. Using appropriate tools and techniques, students will collect, organize, analyze, and interpret data using the scientific method and will contrast ideas resulting from this method with non-scientific ideas.
2. Demonstrate a coherent understanding of the characteristic themes and concepts that pervade and/or unify the discipline of biology, specifically evolution, information transfer, and energetics.
3. Locate, identify, evaluate, and discuss information from current primary and secondary literature on biological topics.
4. Identify, explain, and evaluate in an analytical matter the hierarchical structure of biological organization.

**2A3. 2012-2013 - *Course* Level Student Learning Outcomes**

*Attached to program review (See appendices).*

**2B. 2012-2013 Student SUCCESS Outcomes**

1. The program will maintain or increase its retention rate from the average of the **program's** prior three-year retention rate. The retention rate is the number of students who finish a term with any grade other than W or DR divided by the number of students at census.
2. The program will maintain or increase the student success rates from the average of the **program's** prior three-year success rates. The student success rate is the percentage of students who receive a grade of C or better.



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**2C. 2012-2013 Program OPERATING Outcomes**

1. The program will aim for WSCH/FTEF at or above the goal set for each course by the district, when possible.
2. Inventory of instructional equipment is functional, current, and otherwise adequate to maintain a quality-learning environment. However, some of the instructional equipment is aging and may need to be replaced in the near future (e.g., microscopes, autoclave, models). Inventory of all equipment over \$200 will be maintained and a replacement schedule will be developed. Service contracts for equipment over \$5,000 will be budgeted if funds are available. Any equipment that breaks and needs immediate repair or replacement will be handled through a contingency budget (as per Ramiro Sanchez).

**2D. Mapping of Student Learning Outcomes - Refer to TracDat**

**3. Operating Information**

**3A. Productivity Terminology Table**

<b>Sections</b>	A credit or non-credit class. Does not include not-for-credit classes (community education).
<b>Census</b>	Number of students enrolled at census (typically the 4 <sup>th</sup> week of class for fall and spring).
<b>FTES</b>	Full Time Equivalent Students A student in the classroom 15 hours/week for 35 weeks (or two semesters) = 525 student contact hours. 525 student contact hours = 1 FTES. Example: 400 student contact hours = $400/525 = 0.762$ FTES. The State apportionment process and District allocation model both use FTES as the primary funding criterion.
<b>FTEF</b>	Full Time Equivalent Faculty A faculty member teaching 15 units for two semesters (30 units for the year) = 1 FTE. Example: a 6 unit assignment = $6/30 = 0.20$ FTEF (annual). The college also computes semester FTEF by changing the denominator to 15 units. However, in the program review data, all FTE is annual. FTEF includes both Full-Time Faculty and Part-Time Faculty. FTEF in this program review includes faculty assigned to teach extra large sections (XL Faculty). This deviates from the prior practice of not including these assignments as part of FTEF. However, it is necessary to account for these assignments to properly represent faculty productivity and associated costs.
<b>Cross</b>	FTEF is assigned to all faculty teaching cross-listed sections. The FTEF assignment is

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<b>Listed FTEF</b>	proportional to the number of students enrolled at census. This deviates from the practice of assigning load only to the primary section. It is necessary to account for these cross-listed assignments to properly represent faculty productivity and associated costs.
<b>XL FTE</b>	Extra Large FTE: This is the calculated assignment for faculty assigned to extra large sections (greater than 60 census enrollments). The current practice is not to assign FTE. Example: if census > 60, 50% of the section FTE assignment for each additional group of 25 (additional tiers).
<b>WSCH</b>	Weekly Student Contact Hours The term "WSCH" is used as a total for weekly student contact hours AND as the ratio of the total WSCH divided by assigned FTEF. Example: 20 sections of 40 students at census enrolled for 3 hours per week taught by 4.00 FTEF faculty. $(20 \times 40 \times 3) = 2,400$ WSCH / 4.00 FTEF = 600 WSCH/FTEF.
<b>WSCH to FTES</b>	Using the example above: $2,400$ WSCH x 35 weeks = 84,000 student contact hours = $84,000 / 525 = 160$ FTES (see FTES definition). Simplified Formulas: $FTES = WSCH/15$ or $WSCH = FTES \times 15$
<b>District Goal</b>	Program WSCH ratio goal. WSCH/FTEF The District goal was set in 2006 to recognize the differences in program productivity.

**3B: Student Success Terminology**

<b>Census</b>	Number of students enrolled at Census (typically the 4 <sup>th</sup> week of class for fall and spring). Census enrollment is used to compute WSCH and FTES for funding purposes.
<b>Retain</b>	Students completing the class with any grade other than W or DR divided by Census Example: 40 students enrolled, 5 students dropped prior to census, 35 students were enrolled at census, 25 students completed the class with a grade other than W or DR: Retention Rate = $25/35 = 71\%$
<b>Success</b>	Students completing the class with grades A, B, C, CR or P divided by Census Excludes students with grades D, F, or NC.

Program specific data was provided in Section 3 for all programs last year. This year, please refer to the data sources available at

[http://www.venturacollege.edu/faculty\\_staff/academic\\_resources/program\\_review.shtml](http://www.venturacollege.edu/faculty_staff/academic_resources/program_review.shtml)

In addition, the 2011-2012 program review documents will provide examples of last year's data and interpretations.

**3C: 2012 – 2013** Please provide program interpretation for the following: Note: Raw data from which these interpretations were developed for the Biological Sciences can be found in the appendices at the end of this document.

**3C1: Interpretation of the Program Budget Information**

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The budget for Biological Sciences has fluctuated over the past 5 years, but overall has trended slightly upward, primarily as a result of the significant increase in faculty expenditures. The supply budget for Biological Sciences, however, experienced a significant reduction in FY10 as compared to FY09 (approx. 40%), and has remained fairly constant from FY10-FY12. Ending of the two-year STEM grant that supplied much of the supplies and equipment from 2008-2010 as well as the discontinuation of the CCBC at Ventura College has placed strain on the department's ability to acquire equipment and supplies. The supply budget for FY13 is projected to hit a 5-year low, poor news for the Biology Department considering the supply intensive nature of the department and inflationary costs of supplies to run the biology courses. The equipment budget experienced a significant increase in FY12 but is uncertain for FY13 academic year.

The Biological Sciences Department offers a variety of laboratory classes that require supplies and equipment. The quality of student laboratory experiences depends upon available supplies and properly functioning equipment. Much of our equipment is aging and in need of replacement or repair (e.g., autoclave, microscopes for microbiology, teaching models, micropipettes, cold storage refrigerators, etc.). Availability of supplies such as enzymes for physiology, living specimens for biology, cell cultures for microbiology, and others dictate which laboratory experiences students can be provided and thus the budget is a critical issue for this department. Facilities needs are also in need of budgetary support, including the re-wiring of the electrical system in some of the labs to accommodate current draw during laboratory experiences, as well as the development of storage facilities to protect natural skeletal materials for anatomy and other equipment.

### **3C2: Interpretation of the Program Inventory Information**

The present inventory is somewhat inadequate, and therefore an inventory is being conducted during the 2012-2013 academic year to assess the Biological Sciences Department equipment. However, it is important to note that much of our present equipment is in need of repair/maintenance, and many laboratory experiences for students are not available due to the need for new equipment and upgrading of obsolete equipment (e.g., autoclave, Biopac units for physiology, microscopes for microbiology and other biology classes, spectrophotometers for biology and physiology, etc.).

### **3C3: Interpretation of the Program Productivity Information**

The productivity in the Biological Sciences has consistently exceeded District goals. Productivity in many classes exceeds the District goals by a large margin and, in the case of classes that are slightly below the District goal, enrollment constraints make it impossible to meet those goals

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(due to the limitations to the number of lab students allowed in each section). In these classes that are limited in enrollment by space, District goals are unrealistic and not consistent with safety considerations. Biology's productivity has been trending upward, and FY12 values are typically above the past three-year average.

### **3C4: Interpretation of the Program Course Productivity Information**

In comparison to laboratory courses, in which enrollment is restricted due to laboratory stations, productivity in lecture courses with larger enrollment capacity is typically much higher (e.g., BIOL V01, 223% of District goal; BIOL V01L, 83% of District goal).

### **3C5: Interpretation of Program Retention, Student Success, and Grade Distribution**

Biological Sciences retention rates (82% in FY12) are consistently above the District retention rates. Furthermore, retention rates are higher than for the three year average and have been trending upward during the past three years.

Student success rates in the Biological Sciences are sometimes higher during summer sessions, but are collectively higher in FY12 (61%) as compared to the past three year average (58%).

Grade distribution in the Biological Sciences has not changed dramatically in FY12 as compared to the past three year averages, although several variations have been observed. In Biology as well as in Physiology there was a noticeable grade shift, B or lower grades were increased somewhat whereas A grades were significantly reduced as compared to the past three year average, perhaps a result of department discussions related to curriculum and grading standards in these classes.

In Microbiology the shift was in the opposite direction, the number of A and B grades increased and the number of C or lower grades was lower than the past three year average. Since the overwhelming majority of Microbiology students intend to become nurses, and since many people's health will depend on these students' knowledge and abilities, it is critically important that we do not relax academic rigor in our efforts to increase student retention or success. Given the challenging nature of this course, current retention and success rates seem surprisingly high.

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**3C6: Interpretation of the Program Completion Information**

Many courses in this Department (e.g., the allied health profession course sequence) are not part of our two degree programs, with the exception of biotech and the biology majors sequence. Biotech has a relatively low completion rate, largely as a result of local biotechnology industry's recruitment of our students from the biotechnology program. Despite this low completion rate, employment of these students in the biotech industry is a measure of success. Completion rates for the Biology program were at a high in FY11 but fell somewhat in FY12, in large part as a result of the grant-related counseling provided to STEM students in FY8-FY10 which was discontinued prior to FY12. Completion rates may be improved significantly by providing appropriate counseling for program participants.

**3C7: Interpretation of the Program Demographic Information**

With the exception of the ANPH and BIOT courses which have a notably higher enrollment of males than females, all other biology courses tend to have a higher enrollment of females than males, especially in ANAT, PHSO and MICR courses where females represent about 70-80% of the total enrollment. Students in biology courses are predominantly either White (Non-Hispanic) or Hispanic (together representing approximately 80% of total enrollment). With the exception of ANAT, PHSO, ANPH, and MICR where the enrollment of White (Non-Hispanics) exceeds that of Hispanics, Hispanic enrollment in other biology courses tends to slightly exceed that of White (Non-Hispanics). The remaining 20% of the enrollment is fairly equally distributed amongst the other race/ethnicities.

**4. Performance Assessment**

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**4A1: 2012-2013 Institutional Level Student Learning Outcomes**

Institutional Level Student Learning Outcome 1	Performance Indicators
Communication	This ISLO will be assessed by the Biology Department during Spring 2013.
<b>Operating Information</b>	
<b>Analysis – Assessment</b>	

Institutional Level Student Learning Outcome 2	Performance Indicators
Reasoning – Scientific and Quantitative	75% of the students will perform at a satisfactory or better level as per the institutional Reasoning- Scientific and Quantitative rubric for scientific reasoning.
<b>Operating Information</b>	
This ISLO will be assessed during Fall 2012 using data from the BIOL V01L course. It will be assessed from written laboratory reports using the PSLO #1 as presented in 2A2 above.	
<b>Analysis – Assessment</b>	
This ISLO has not yet been assessed.	

Institutional Level Student Learning Outcome 3	Performance Indicators
Critical Thinking and problem solving	This ISLO will be assessed by the Biology Department during the 2013-2014 academic year as per the ISLO institutional calendar.
<b>Operating Information</b>	
<b>Analysis – Assessment</b>	

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Institutional Level Student Learning Outcome 4	Performance Indicators
Information Literacy	This ISLO will be assessed by the Biology Department during the 2013-2014 academic year as per the ISLO institutional calendar.
<b>Operating Information</b>	
<b>Analysis – Assessment</b>	

Institutional Level Student Learning Outcome 5	Performance Indicators
Personal/community awareness and academic / career responsibilities	This ISLO will not be assessed by the Biology Department.
<b>Operating Information</b>	
<b>Analysis – Assessment</b>	

**4A2: 2012-2013 Program Level Student Learning Outcomes - *For programs/departments offering degrees and/or certificates***

Program-Level Student Learning Outcome 1	Performance Indicators
Using appropriate tools and techniques, students will collect, organize, analyze, and interpret data using the scientific method and will contrast ideas resulting from this method with non-scientific ideas.	75% of the students will achieve at satisfactory or better per the elements of the rubric associated with this PSLO (see TracDat).

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<b>Operating Information</b>	
Assessment of this PSLO will be performed in the Fall 2012 semester from an analysis of written laboratory reports in the BIOL V01L class.	
<b>Analysis – Assessment</b>	
This PSLO has not yet been assessed.	

Program-Level Student Learning Outcome 2	Performance Indicators
Demonstrate a coherent understanding of the characteristic themes and concepts that pervade and/or unify the discipline of biology, specifically evolution, information transfer, and energetics.	To be developed.
<b>Operating Information</b>	
We are presently working on a three-year plan for the assessment of all of our PSLOs.	
<b>Analysis – Assessment</b>	
This PSLO has not yet been assessed.	

Program-Level Student Learning Outcome 3	Performance Indicators
Locate, identify, evaluate, and discuss information from current primary and secondary literature on biological topics.	To be developed.
<b>Operating Information</b>	
We are presently working on a three-year plan for the assessment of all of our PSLOs.	
<b>Analysis – Assessment</b>	
This PSLO has not yet been assessed.	



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Program-Level Student Learning Outcome 4	Performance Indicators
Identify, explain, and evaluate in an analytical matter the hierarchical structure of biological organization.	To be developed.
<b>Operating Information</b>	
We are presently working on a three-year plan for the assessment of all of our PSLOs.	
<b>Analysis – Assessment</b>	
This PSLO has not yet been assessed.	

Program-Level Student Learning Outcome 5	Performance Indicators
<b>Operating Information</b>	
<b>Analysis – Assessment</b>	

**4A3:** 2012-2013 Course Level Student Learning Outcomes - Refer to TracDat

**4B:** 2012-2013 Student Success Outcomes

Student Success Outcome 1	Performance Indicators
The program will attempt to maintain or increase its retention rate from the average of the <b>program's</b> prior three-year retention rate.	The program will monitor the retention rate and address any concerns that arise.
<b>Operating Information</b>	

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Institutional researcher will provide needed data for analysis.
<b>Analysis – Assessment</b>
Analysis is needed.

<b>Student Success Outcome 2</b>	<b>Performance Indicators</b>
The program will attempt to maintain or increase the student success rates from the average of the <b>program's</b> prior three-year success rates.	The program will monitor the success rate and address any concerns that arise.
<b>Operating Information</b>	
Institutional researcher will provide needed data for analysis.	
<b>Analysis – Assessment</b>	
Analysis is needed.	

**4C. 2012-2013 Program Operating Outcomes**

<b>Program Operating Outcome 1</b>	<b>Performance Indicators</b>
The program will aim for WSCH/FTEF at or above the goal set for each course by the district, when possible.	The program will monitor WSCH/FTEF levels and for all classes that are not constrained by maximum occupancy limits that do not meet the WSCH/FTEF levels set by the District the program will convene to consider means of improving these levels.
<b>Operating Information</b>	
Institutional researcher will provide needed data for analysis.	
<b>Analysis – Assessment</b>	

<b>Program Operating Outcome 2</b>	<b>Performance Indicators</b>
Inventory of instructional equipment is functional, current, and otherwise adequate to maintain a quality-learning environment. However, some of the instructional equipment is aging and may need to be	All essential instructional equipment that becomes damaged and/or non-functional will be repaired or replaced within one year of the time it becomes non-functional.

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<p>replaced in the near future (e.g., microscopes, autoclave, models). Inventory of all equipment over \$200 will be maintained and a replacement schedule will be developed. Service contracts for equipment over \$5,000 will be budgeted if funds are available. Any equipment that breaks and needs immediate repair or replacement will be handled through a contingency budget (as per Ramiro Sanchez).</p>	
<b>Operating Information</b>	
<p>Institutional researcher will provide needed data for analysis. In addition, comparison of inventory from the 2012-2013 Program Review is to be compared to the inventory at the time of the 2013-2014 Program Review.</p>	
<b>Analysis – Assessment</b>	
<p>Completion of inventory is required before analysis can be accomplished.</p>	

**4D. Program Review Rubrics for Instructional Programs**

**Academic Programs**

<b>Point Value</b>	<b>Element</b>	<b>Score</b>
Up to 6	Enrollment demand	6
Up to 6	Sufficient resources to support the program (ability to find qualified instructors; financial resources; equipment; space)	3
Up to 4	Agreed-upon productivity rate	4
Up to 4	Retention rate	3
Up to 3	Success rate (passing with C or higher)	2
Up to 3	Ongoing and active participation in SLO assessment process	3
<b>Total Points</b>	<b>Interpretation</b>	
22 – 26	Program is current and vibrant with no further action recommendation	
18 – 21	Recommendation to attempt to strengthen the program	
Below 18	Recommendation to consider discontinuation of the program	

**TOTAL**

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**CTE Programs**

Point Value	Element	Score
Up to 6	Enrollment demand	
Up to 6	Sufficient resources to support the program (ability to find qualified instructors; financial resources; equipment; space)	
Up to 6	Program success (degree / certificate / proficiency award completion over 4 year period)	
Up to 4	Agreed-upon productivity rate	
Up to 4	Retention rate	
Up to 4	Employment outlook for graduates / job market relevance	
Up to 3	Success rate (passing with C or higher)	
Up to 3	Ongoing and active participation in SLO assessment process	
Total Points	Interpretation	
31 - 36	Program is current and vibrant with no further action recommendation	
25 - 30	Recommendation to attempt to strengthen the program	
Below 25	Recommendation to consider discontinuation of the program	

**5. Findings**

**2012-2013 - FINDINGS**

**Finding 1:**

Biology's highest concern is for our aging and inadequate building infrastructure and equipment. The installation of inadequate electrical circuits in the labs continues to be a problem for the performance of many of our lab exercises. The aging of our equipment and lack of sufficient replacement and/or maintenance continues to stress our ability to present appropriate lab exercises to all of our students. We have 2 safety-related concerns: monitoring air quality and air-conditioning/better ventilation for our students and staff, particularly in our cadaver room, and the inevitable equipment failures (eg: the autoclave) that also would greatly reduce our ability to serve the college. An air quality/ air-conditioning project has been funded and awaits installation pending completion of engineering, state approval, and the bidding process. The presence of hazardous air-borne chemicals in the Biology suite continues as this process proceeds. (See Initiative BIOL1201).

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**Finding 2:**

We continue to need more full-time instructional staff to move the Biology Department closer to the 75% FT/PT instructor/student ratio specified in AB 1725. Our present FT/PT ratio in the department is significantly below that level. We understand that current budget constraints may prohibit hiring a FT instructor in Biology at the present time, and therefore we are not requesting a FT hire at this time. However, the Biology Department believes that, although PT instructors provide a vitally important contribution to the department and its students, FT instructors are typically more involved in the inner workings of the department and college (e.g., attend more department meetings, represent the department as members of more college-level committees, are more involved in department-related clubs, provide a greater contribution to the analysis of program review, coordinate the writing of more curriculum, contribute to department budget analysis, etc. FT instructors also provide office hours on a daily basis and thus are typically more available to students outside of the classroom. A high FT to PT instructor ratio is thus an important contribution to student learning and success. (See Initiative BIOL1208).

**Finding 3:**

To address the need to discuss and collaborate on curriculum, budget, SLO data, equipment needs, program review, and other issues, the Biology Department has set up regularly scheduled monthly department meetings. When needed, departmental meetings are called more often. (See Initiatives BIOL1200, BIOL1301, BIOL1303, BIOL1305, BIOL1308, and BIOL1310).

**Finding 4:**

The teaching of biology is an equipment intensive endeavor. It is vital that equipment be maintained in good working order if we are to continue offering outstanding learning experiences to our students. Our budget-dependent inability to repair or replace aging equipment as well as to acquire new equipment threatens the quality of instruction in the laboratories. In response to this need, the Biology Department has developed a variety of initiatives directed at the acquisition of new or replacement equipment in order that we may improve instruction. Re-building microscopes and training staff to provide continued microscope repairs, acquisition of cameras to improve demonstration microscopy, acquisition of fish tank chillers, acquisition of biological models, mounts of biological specimens, professionally prepared microscope slides, acquisition of DVDs and other media, as well as building of an osteological storage facility to protect an expensive bone collection, and implementation of other initiatives will contribute significantly to the improvement of the quality of equipment in the department and therefore contribute significantly to student learning.

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**Finding 5:**

The productivity in the Biological Sciences has consistently exceeded District goals. Productivity in many classes exceeds the District goals by a large margin and, in the case of classes that are slightly below the District goal, enrollment constraints make it impossible to meet those goals (due to the limitations to the number of lab students allowed in each section). In these classes that are limited in enrollment by space, District goals are unrealistic and not consistent with safety considerations.

**Finding 6:**

Biology has a high retention and success rate for such a rigorous subject (close to or exceeding the college's rates). PHSO and MICR have higher retention and success rates relative to ANAT due to their position farther along the sequence of required pre-nursing classes.

### 6. Initiatives

**6A: 2011-2012 - Initiatives**

**Initiative 1: SLO, Curriculum, and Equipment Needs Collaboration**

**Initiative ID: 1200**

**Links to Finding: 3**

**Benefits:**

Regularly-scheduled, ongoing collaboration on curriculum issues and SLO data, as well as continuing discussions of equipment needs, are a critical component of any lab-based Biology Program. Such collaboration would contribute significantly to the identification of equipment and facility needs as well as to better implementation of SLO initiatives.

**Request for Resources:** None (Release time would be beneficial).

**Funding Sources:**

No new resources are required (release time for collaboration would optimize both FT and PT participation)	X
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**Initiative 2: Building Infrastructure and Capital Equipment**

**Initiative ID: BIOL1201**

**Links to Finding: 3**

**Request for Resources:** Equipment, monitoring equipment for cadaver room, air conditioning/ventilation for laboratory suite, replacement for failed capital equipment (e.g., autoclave).

**Benefits:**

The health and safety of students and staff and the viability of the program are at risk due to the aging and inadequate building infrastructure, and the aging of our capital equipment. Better health for all

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personnel (students and staff) in Life Sciences lab areas as well as continued operation of an effective Biology Program for the foreseeable future would be enhanced by upgrading of capital equipment and making modifications to the existing infrastructure (e.g., monitoring equipment for formaldehyde levels in cadaver area, air conditioning/ventilation for all laboratory areas, replacing autoclave and other equipment that become safety hazards, etc.). Capital equipment acquisition and repair and facilities modifications are required. Note: Air conditioning/ventilation for the Biology laboratory suite, as well as ventilation and cooling of the cadaver room to meet federal formaldehyde exposure standards, has been funded and is at the engineering stage. Facility implementation is pending.

**Funding Sources:** This initiative has been funded and is pending completion of engineering design and construction.

No new resources are required (use existing resources)	
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	X
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	X
Requires college facilities funds	X
Requires other resources (grants, etc.)	

### Initiative 3: Demonstration Microscope

**Initiative ID:** BIOL1203

**Links to Finding:** 4

**Benefits:**

Students' retention of visual information, their success at oil-immersion microscopy, and their interpretation of experimental observations and data would all improve with the instructor's ability to display higher quality images in the Microbiology and other laboratories. Purchase of two higher-quality cameras for displaying microscope images to students in the Microbiology and other laboratories would improve student learning. Two such camera systems are needed, one to meet the needs of the Microbiology lab and another to meet the needs of the other biology laboratories on a rotating basis. The estimated cost of these camera systems is \$3000 each.

**Request for Resources:** Equipment. Purchase of two microscope camera systems.

**Funding Sources:**

Requires college equipment funds (other than computer related)	X
Requires college facilities funds	
Requires other resources (grants, etc.)	

### Initiative 4: Augmentation of BIOL V01L Laboratory Investigations

**Initiative ID:** BIOL1204

**Links to Finding:** 4

**Benefits:**

The acquisition of fish tank chillers would provide students with 10 and 17 degree aquaria at their assigned temperatures for performing laboratory observations and would time during lab needed by instructors to provide much needed instruction/demonstrations during the lab. It would save time required for acclimation and potentially reduce both shock on the fish and error in the data associated

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with changes in temperature or fish condition as a result of shock. Instructors would have more time to discuss the scientific method, interpretation of the results, and graph construction.

Cost: 2 Pacific Coast Imports 113 HP mini aquarium chillers at \$333 ea = \$666

**Request for Resources:** Equipment. Purchase of 2 mini aquarium chillers.

**Funding Sources:**

Requires college equipment funds (other than computer related)	X
Requires college facilities funds	
Requires other resources (grants, etc.)	

### **Initiative 5: Natural Skeletal Materials, Human Organs and Teaching Models**

**Initiative ID:** BIOL1205

**Links to Finding:** 4

**Benefits:**

The acquisition of natural human skeletal materials, organs and tissue samples as well as human organ and organ system models (e.g., blood vessel models, brain and nervous system models, eye models, etc.) would provide students with much needed hands-on materials for study of human anatomy. The study of human anatomical models followed by observation of actual organs/tissues is a critical component of the teaching of human anatomy, especially to pre-allied health professional and medical students. (ANAT V01, ANPH V01)

Estimated cost for skeletal materials and human organs/tissues: \$10,000.

**Request for Resources:** Equipment. Anatomical models and natural skeletal, organ and tissue specimens.

**Funding Sources:**

Requires college equipment funds (other than computer related)	X
Requires college facilities funds	
Requires other resources (grants, etc.)	

### **Initiative 6: Herbarium Room, Presses, Plant Dryer, and Plant Specimens**

**Initiative ID:** BIOL1206

**Links to Finding:** 4

**Benefits:**

Herbarium specimens, including native plants, provided to students in the lab would help them learn to identify appropriate native plants in the laboratory prior to performing assignments related to the identification, morphology and ecology of these plants. The acquisition of a plant dryer, larger plant presses (we currently have a single but largely inadequate press), and development of an herbarium work and storage room would greatly benefit the plant-related laboratory activities. This initiative is personnel intensive as it requires time-consuming collecting and preparation of specimens.

Estimated cost for 3 standard plant presses and supplies to construct a specimen dryer is \$400.

**Request for Resources:** This initiative has been funded, the herbarium room has been renovated and awaits installation of cabinets and other equipment, as well as purchase and installation of a dehumidifier.

**Funding Sources:**

No new resources are required (use existing resources)	
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Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	X
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	X
Requires college facilities funds	
Requires other resources (grants, etc.)	

**Initiative 7: Parscore System**

**Initiative ID: BIOL1207**

**Links to Finding: 3**

**Benefits:**

Parscore systems are a more modern version of Scantrons (same company) and can help us gather data more quickly and effectively from our students as well as provide better information on what our students are learning and/or have confused. Such a system can be used to help generate SLO assessment reports from multiple choice data efficiently. A Parscore system would facilitate SLO & other course assessments and improve the quality of the information gathered. Equipment and training are required.

A verbal cost estimate for a departmental Parscore system from company representative: \$6600 (for a scanner and single computer with software). Additional costs need to be included for training faculty. Further information from the vendor is available including a sample quote on the Biology Department portion of the college's SLO Sharepoint site. Note: This initiative has been funded and awaits implementation.

**Request for Resources:** The Parscore initiative has been funded and awaits implementation (purchase of equipment and staff training).

**Funding Sources:**

No new resources are required (use existing resources)	
Requires additional general funds for personnel, supplies or services (includes maintenance contracts and training)	X
Requires computer equipment funds (hardware and software)	X
Requires college equipment funds (other than computer related)	
Requires college facilities funds	
Requires other resources (grants, etc.)	
Requires other resources (grants, etc.)	

**Initiative 8: Full-time Biology Instructional Staff Hiring**

**Initiative ID: BIOL1208**

**Links to Finding: 2**

**Benefits:**

At present the Biology Department is staffed at a full time to part time instructor ratio is significantly below the AB 1725 target staffing ratio of 75%. As students benefit significantly from a higher FT/PT ratio (availability of FT instructors during office hours, higher attendance of FT instructors at department meetings, higher number of lecture/lab combinations taught by the same instructor, etc.) it would be very much beneficial to hire additional full time staff to increase the FT/PT instructor ratio.

**Request for Resources: New full time staff member.**

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### Funding Sources:

No new resources are required (use existing resources)	
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	X

### 2011 - 2012 FINAL Program Initiative Priority Ratings

Line Number	Program	Category	Program Priority (0, 1, 2, 3...)	Division Priority (R, H, M, L)	Committee Priority (R, H, M, L)	College Priority (R, H, M, L)	Initiative ID	Initiative Title	Resource Description	Estimated Cost	Adjusted Cost	Accumulated Costs	Full Time or Part Time
1	Biology	None	0	H			BIO1200	Curriculum & SLO collaboration & discussion	Regular meetings of the department			-	
2	Biology	Equipment	1	R	R	R	BIO1201	Lab safety and continuing operation	Acquire formaldehyde monitoring equipment	2,000	2,000	2,000	
3	Biology	Equipment	1	R	H	H	BIO1201	Lab safety and continuing operation	Assure continuing instruction when capital equipment (Autoclave) fails. This sterilizing device is also used by the Student Health to sterilize their biowaste.	80,000	20,000	22,000	
4	Biology	Facilities	1	R	R	H	BIO1201	Lab safety and continuing operation	Add air-conditioning and ventilation to lab area	500,000	500,000	522,000	
5	Biology	Equipment	2	H	H	H	BIO1202	New Body Model	New Body Model for A & P	8,000	8,000	530,000	
6	Biology	Equipment	3	L	M	M	BIO1203	High-quality microscope camera	2 new higher-quality microscope cameras for classroom display	4,000	4,000	534,000	
7	Biology	Equipment	4	L	L	L	BIO1204	Fish tank chillers	These would save time required for acclimation and potentially reduce both shock on the fish and error in the data	700	700	534,700	
8	Biology	Equipment	5	M	H	H	BIO1205	Natural skeletal materials and x-ray viewer	provide students with much needed hands-on materials for study and an important teaching tool	7,000	7,000	541,700	
9	Biology	Equipment	6	M	H	H	BIO1206	Herbarium presses & plant dryer	Herbarium specimens with native plants provided to students in the lab would help them learn to identify the list of native plants. Additional funds for pay for labor to accomplish this.	400	400	542,100	
10	Biology	Equipment	6	M	H	H	BIO1206	Herbarium presses & plant dryer	Herbarium specimens with native plants provided to students in the lab would help them learn to identify the list of native plants. Additional funds for pay for labor to accomplish this.	400	400	542,500	
11	Biology	Technology	7	M	H	H	BIO1207	ParScore System	Acquisition of ParScore or similar system for campus and training	7,000	7,000	549,500	
12	Biology	Faculty	8	H			BIO1208	New FT instructor	New FT instructor	108,000	108,000	657,500	FT

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### 6B: 2012-2013 INITIATIVES

**Initiative ID should be consistent. For example:**

**2011-2012 identified initiatives - ART1201, ART1202, etc.**

**2012-2013 identified initiatives - ART1301, ART1302, etc.**

#### **Initiative 1: Repair, Refurbishing, & Rebuilding Microscopes**

**Initiative ID: BIOL1301**

**Links to Finding: 4 & 6**

**Benefits:** The microscopes used in Microbiology and other biology courses are in a poor state of repair. As these instruments are critical to student performance in the Microbiology and other biology courses, the repair, refurbishing, and/or re-building of aging microscopes is critical to a continued offering of an outstanding Microbiology course as well as other biology courses. Training of Tech Staff to perform these repairs in the future would be a cost effective and efficacious method to maintain a proper state of repair of the microscopes.

**Request for Resources:** Repair contract. Training workshop for Tech Staff. Cost: \$5200

**Funding Sources:**

No new resources are required (use existing resources)	
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	X
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	X
Requires college facilities funds	
Requires other resources (grants, etc.)	

#### **Initiative 2: Demonstration Microscope Camera System**

FROM 2011-2012 LIST

**Initiative ID: BIOL1203**

**Links to Finding: 4**

**Benefits:**

Students' retention of visual information, their success at oil-immersion microscopy, and their interpretation of experimental observations and data would all improve with the instructor's ability to display higher quality images in the Microbiology and other laboratories. Purchase of two higher-quality cameras for displaying microscope images to students in the Microbiology and other laboratories would improve student learning. Two such camera systems are needed, one to meet the needs of the Microbiology lab and another to meet the needs of the other biology laboratories on a rotating basis. The estimated cost of these camera systems is \$3000 each.

**Request for Resources:** Equipment. Purchase of two microscope camera systems.

**Funding Sources:**

Requires college equipment funds (other than computer related)	X
Requires college facilities funds	
Requires other resources (grants, etc.)	

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### Initiative 3: Equipment Augmentation of Biology Laboratory Investigations FROM 2011-2012 LIST

Initiative ID: BIOL1302

Links to Finding: 4

#### Benefits:

The acquisition of fish tank chillers would provide students with 10 and 17 degree aquaria at their assigned temperatures for performing laboratory observations and would time during lab needed by instructors to provide much needed instruction/demonstrations during the lab. It would save time required for acclimation and potentially reduce both shock on the fish and error in the data associated with changes in temperature or fish condition as a result of shock. Instructors would have more time to discuss the scientific method, interpretation of the results, and graph construction.

Purchase of 2 Pacific Coast Imports 113 HP mini aquarium chillers. BIOL V01.

The acquisition of microscope slides (BIOL V23) and video clip libraries on plants, classification, cell biology (BIOL V04, BIOL V23), human biology (BIOL V12, ANPH V01), and other important concepts, as well as video clips and/or TV animations would provide students with visual representations of important biological concepts to augment class lessons. BIOL V04, BIOL V12, BIOL V23, ANPH V01.

Students in Biology laboratories benefit greatly from having models, specimens, and other hands-on materials from which to learn taxonomic/evolutionary relationships, morphology, and other concepts. Acquisition of such models provides a three-dimensional learning approach that greatly augments reading, writing, studying photos, and other teaching strategies. ANPH V01, BIOL V03.

**Request for Resources:** Equipment. Purchase of 2 mini aquarium chillers. Purchase of models, museum mount specimens, and other hands-on materials. Purchase of microscope slides. Purchase of video clips, DVDs. Total Cost: \$11,666.

#### Funding Sources:

No new resources are required (use existing resources)	
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	X
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	X
Requires college facilities funds	
Requires other resources (grants, etc.)	

### Initiative 4: SLO, Curriculum, and Equipment Needs Collaboration FROM 2011-2012 LIST

Initiative ID: BIOL1200

Links to Finding: 3

#### Benefits:

Regularly-scheduled, ongoing collaboration on curriculum issues and SLO data, as well as continuing discussions of equipment needs, are a critical component of any lab-based Biology Program. Such collaboration would contribute significantly to the identification of equipment and facility needs as well as to better implementation of SLO initiatives.

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**Request for Resources:** None (Release time would be beneficial).

**Funding Sources:**

No new resources are required (release time for collaboration would optimize both FT and PT participation)	X
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### Initiative 5: Inventory and Securing of Osteological Materials

**Initiative ID:** BIOL1303

**Links to Finding:** 4 & 1

**Benefits:** Because of the high cost and difficulty of replacing these items, developing a better way to house our skeletal materials as well as herbarium specimens, particularly the highest quality instructional materials, is critical. This will have the added benefit of clearing out of some additional space to better house our muscle and other models and instructional materials. ANAT V01, ANPH V01, BIOL V01, BIOL V03, BIOL V14.

**Request for Resources:** Provision of space in the Biology laboratory/stockroom suite, construction materials and personnel to build and install cabinets for bone storage. Purchase of herbarium cabinets to store plant specimens in a fungus-free environment. Cost: approx. \$6780.

**Funding Sources:**

No new resources are required (use existing resources)	
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	X
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	
Requires college facilities funds	X
Requires other resources (grants, etc.)	

### Initiative 6: Increased Leadership and Collaboration on SLO Data Collection and Analysis

**Initiative ID:** BIOL1304

**Links to Finding:** 3

**Benefits:** Steps taken to develop an organizational plan to have the lead instructor and/or the department chair or other full-time faculty assist part-time faculty in the completion of Individual Faculty Assessment forms and clarify the nature of the SLO data collection and analysis process at the beginning of the term is critical to the acquisition of valid data for SLO assessment. It would also be important in this plan to improve communication and interaction between faculty on SLO issues early in the semester to clarify specifics of SLO data acquisition and assessment. This organizational plan will include subsequent follow up to make certain data is collected by all involved instructors. ANAT V01, BIOL V01L.

**Request for Resources:** None. Release time for conferencing would be beneficial.

**Funding Sources:**

No new resources are required (use existing resources)	X
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	

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Requires college facilities funds	
Requires other resources (grants, etc.)	

**Initiative 7: Improvement in Class Activities, Discussions, Q and A, Guidance and Feedback**

**Initiative ID: BIOL1305**

**Links to Finding: 3 & 6**

**Benefits:** Improving instruction by putting slides on PowerPoint presentations with labels for student viewing (e.g., in ANPH V01), asking more questions of students while reviewing the materials with the slides, developing more group activities and visiting groups during laboratory group collaboration, increasing class activities and discussions, pairing up academically stronger students with those who need more help to reinforce the competence of both the strong and weak students, stating goals of activities more explicitly, revising activities leading up to assignments (increased preparation and use of anticipatory activities), providing more background information prior to classes (e.g., more background information on cellular biology in BIOL V42), increasing guidance for students on assignments (e.g. providing information on which publications are suitable for use), creating and reviewing study guides during online or face-to-face office hours, increasing student collaboration and/or peer review, increasing class discussions and activities, stating goals and objectives more clearly, modeling of appropriate skills followed by collaborative student practice (e.g., interpreting Punnett squares in BIOL V23 and BIOL V01), providing more frequent and more comprehensive feedback on student progress, and other instructional strategies in the classroom would benefit student learning significantly. ANPH V01, BIOL V10, BIOL V12, BIOL V18, BIOL V23, BIOL V42

**Request for Resources:** None. Release time for collaboration would be beneficial. Student access to computers in the classroom would be beneficial.

**Funding Sources:**

No new resources are required (use existing resources)	X
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	
Requires college facilities funds	
Requires other resources (grants, etc.)	

**Initiative 8: Instructor Collaboration and Development of New Instructional Activities**

**Initiative ID: BIOL1306**

**Links to Finding: 3 & 6**

**Benefits:** Increasing collaboration between instructors to identify the most successful activities leading to student success (including the development of increased supplemental activities) and incorporation of these activities into lecture/lab sections will lead to improved instruction and student learning. Addition/improvement of an enhanced online component to class, use of Tegrity to record lessons for students' later access, incorporation of more computer simulations illustrating important concepts, use of PhysioEx to augment laboratory so as to improve understanding of important concepts (PHSO V01), meetings between instructors from other institutions to discuss pedagogy, development of better Powerpoint slides of major concepts (BIOL V29), and improved availability of models for the tutoring center would be significantly helpful to students. BIOL V01, PHSO V01, ANAT V01, BIOL V29.

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**Request for Resources:** Tegrity systems and access for all interested instructors, D2L training, computer simulations, models in tutoring center, release time for collaborations. Cost: unknown.

**Funding Sources:**

No new resources are required (use existing resources)	
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	X
Requires computer equipment funds (hardware and software)	X
Requires college equipment funds (other than computer related)	X
Requires college facilities funds	
Requires other resources (grants, etc.)	

### Initiative 9: Standardization/Synchronization of Lab and Lecture Content in Anatomy/Physiology

**Initiative ID:** BIOL1307

**Links to Finding:** 3

**Benefits:** Meeting on a regular basis to discuss the extent to which we can standardize course materials (e.g., list of bone landmarks and muscles in the lab in Anatomy) to better facilitate students from different sections working with each other or visiting labs from another instructor to review lab material would clarify expectations in the course and significantly benefit students. Making online resources available to all instructors, facilitating training in D2L use, and improving collaboration between instructors to better synchronize Anatomy and Physiology courses is pedagogically sound. ANAT V01 and PHSO V01

**Request for Resources:** Release time for instructors for collaboration.

**Funding Sources:**

No new resources are required (use existing resources)	X
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	
Requires college facilities funds	
Requires other resources (grants, etc.)	

### Initiative 10: Increased Writing in the Classroom

**Initiative ID:** BIOL1308

**Links to Finding:** 3 & 6

**Benefits:** Writing is a powerful pedagogical technique that significantly enhances student learning. Increased writing assignments in which students properly express scientific hypotheses, experimental results and interpretations, properly and without plagiarism summarize important literature, and describe important biological concepts will significantly contribute to and augment classroom lessons. Instructor collaboration on the creative use of essays, short answers, 'letters to grandparents', term papers, and other writing assignments without undue time burden for grading on instructors can result in increased the use of this teaching strategy. Strategies to improve writing include having students

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write and, after faculty examination of first draft, re-write papers, reports, etc. BIOL V01, BIOL V29, BIOL V29L.

**Request for Resources:** Training. Release time for collaboration would be beneficial. Training workshops on the use of writing for instructors would likewise be extremely beneficial. Cost: \$1000.

**Funding Sources**

No new resources are required (use existing resources)	
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	X
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	
Requires college facilities funds	
Requires other resources (grants, etc.)	

**Initiative 11: Collection of Improved Data for Assessment of Teaching Effectiveness**

**Initiative ID:** BIOL1309

**Links to Finding:** 3 & 6

**Benefits:** Better interaction with and more frequent feedback to students on course acquired skills (e.g., focusing the microscope in BIOL V01L) early in the semester would be of great value in identifying problem areas and addressing these early on so that students have opportunity to improve. Students who are not perfecting their microscopy and other skills need to be identified by patient instructor observation, and increased one on one instructor/student interaction with improved guidance needs to follow for students who struggle. Additionally, assessment of learning progress (data collection) would be of use in improving pedagogy. BIOL V01L

**Request for Resources:** None

**Funding Sources**

No new resources are required (use existing resources)	X
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	
Requires college facilities funds	
Requires other resources (grants, etc.)	

**Initiative 12: Review and Revision of Exam Questions**

**Initiative ID:** BIOL1310

**Links to Finding:** 3 & 6

**Benefits:** It is important that exams be readable and understandable to students so that they as accurately as possible measure student learning. Revision of exams to make them readable and understandable would allow instructors to more accurately assess teaching strategies and learning outcomes of students, and in turn would provide instructors with data needed to improve instruction where learning is less than optimal. BIOL V03/V04, BIOL V23.

**Request for Resources:** None.

**Funding Sources**

No new resources are required (use existing resources)	X
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Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	
Requires college facilities funds	
Requires other resources (grants, etc.)	

**Initiative 13: Collaboration with Biotechnology Industry Speakers**

**Initiative ID: BIOL1311**

**Links to Finding: 3**

**Benefits:** Obtaining advice from biotechnology speakers (BIOL V31/BIOT V31), and subsequently implementing suggestions, as well as providing more general molecular biology information during the beginning of the semester (BIOL V31/BIOT V31), and creating additional visualization tools to connect techniques to practical applications, would be greatly beneficial to the success of students in Biotechnology. BIOL V31/BIOT V31.

**Request for Resources:** None.

**Funding Sources:**

No new resources are required (use existing resources)	X
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	
Requires college facilities funds	
Requires other resources (grants, etc.)	

**Initiative 14: Staffing of Tutoring Center**

**Initiative ID: BIOL1312**

**Links to Finding: 4 & 6**

**Benefits:** Staffing of a biology tutoring component of the college's Tutoring Center with knowledgeable student tutors, and provision of additional models/instructional materials for the center, would provide biology students access to study materials, study sessions and tutoring, guidance in appropriate study techniques, and other resources outside of class time and when the instructor was not available. Maintenance of a routine biology study session in the Tutoring Center would significantly improve student success for those students who availed themselves to the opportunity.

**Request for Resources:** Cost: \$3240.

**Funding Sources:**

No new resources are required (use existing resources)	
Requires additional general funds for personnel, supplies or services (includes maintenance contracts)	X
Requires computer equipment funds (hardware and software)	
Requires college equipment funds (other than computer related)	X
Requires college facilities funds	

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Requires other resources (grants, etc.)	
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**6C: 2012-2013 Program Initiative Priority Ratings**

**Note:** Initiatives are arranged in order of priority as determined by the Biology Department (the top entry being the highest priority (#1), the second entry being the next highest priority (#2), etc.). Priority = 0 refers to initiative for which no resources are required, but are important priorities of the Biology Department to improving instruction and student learning.

Program	Finding Number	Category	Program Priority (R, H, M, L)	Division Priority (R,H,M,L)	Committee Priority (R, H, M, L)	College Priority (H, M, L)	Initiative ID	Initiative Title	Resource Description	Estimated Cost
BIOL	4 & 6	Personnel	H				BIOL1301	Repair, Refurbishing, & Rebuilding Microscopes	Rebuild damaged microscopes as needed and provide tech training to maintain microscopes in the future	\$5200
BIOL	4	Equipment	H				BIOL1302	Equipment Augmentation of Biology Laboratory Investigations	Acquisition of two fish chillers, teaching models, specimen slides, closed-captioned DVDs, and other hands-on teaching materials important for improved student visualization	\$11,666
BIOL	4	Technology	H				BIOL1203	Demonstration Microscope Camera System	Acquire two camera systems to project images from demonstration	\$6000

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									microscope	
BIOL	1 & 4	Facilities	H				BIOL1303	Inventory and Securing of Osteological Materials	Provide a secure and safe storage facility for natural skeletal structures in the Anatomy lab	\$6780
BIOL	4 & 6	Personnel	M				BIOL1312	Staffing of Tutoring Center	Provide trained biology tutors to lead routine biology study sessions in the Tutoring Center	\$3240
BIOL	3 & 6	Personnel	L				BIOL1308	Increased Writing in the Classroom	Provide professional writing in the classroom workshops for instructors and develop more writing activities in the biology classrooms	\$1000
BIOL	3	None	0				BIOL1200	SLO, Curriculum, and Equipment Needs Collaboration	Regular meetings of department members to collaborate on equipment needs and curriculum/SLO issues	0
BIOL	3	None	0				BIOL1304	Increased Leadership and Collaboration on SLO Data Collection and Analysis	Class coordinator to convene and facilitate meetings of instructors who teach common courses to discuss SLO data collection and analysis	0
BIOL	3 & 6	None	0				BIOL1305	Improvement in Class Activities, Discussions, Q and A, Guidance and Feedback	Individual instructors focus on improving teaching strategies and methodologies	0
BIOL	3 & 6	None	0				BIOL1306	Instructor Collaboration and Development of New Instructional Activities	Instructors to meet to discuss pedagogy and new instructional activities. To include meeting with colleagues from other colleges.	0

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BIOL	3	None	0				BIOL1307	Standardization and Synchronization of Lab and Lecture Content in Anatomy/Physiology	Anatomy and Physiology instructors to meet regularly to standardize lab and lecture curriculum and synchronize lecture and lab	0
BIOL	3 & 6	None	0				BIOL1309	Collection of Improved Data for Assessment of Teaching Effectiveness	Instructors to focus on improving assessment of student skills and knowledge early in the semester in order to improve instruction	0
BIOL	3 & 6	None	0				BIOL1310	Review and Revision of Exam Questions	Instructors to analyze the readability and understandability of exam questions	0
BIOL	3	None	0				BIOL1311	Collaboration with Biotechnology Industry Speakers	Biotech instructors to meet with biotechnology professionals to design improved Biotechnology class offerings	0

**6D: PRIORITIZATIONS OF INITIATIVES WILL TAKE PLACE AT THE PROGRAM, DIVISION, COMMITTEE, AND COLLEGE LEVELS:**

**Program/Department Level Initiative Prioritization**

All initiatives will first be prioritized by the program/department staff. Prioritize the initiatives using the **RHML** priority levels defined below.

**Division Level Initiative Prioritization**

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The program initiatives within a division will be consolidated into division spreadsheets. The dean may include additional division-wide initiatives. All initiatives will then be prioritized using the **RHML** priority levels defined below.

### **Committee Level Initiative Prioritization**

The division's spreadsheets will be prioritized by the appropriate college-wide committees (staffing, technology, equipment, facilities) using the **RHML** priority levels defined below.

### **College Level Initiative Prioritization**

Dean's will present the consolidated prioritized initiatives to the College Planning Council. The College Planning Council will then prioritize the initiatives using the **RHML** priority levels defined below.

**R:** Required – mandated or unavoidable needs (litigation, contracts, unsafe to operate conditions, etc.).

**H:** High – approximately 1/3 of the total program/department/division's initiatives by resource category (personnel, equipment, etc.)

**M:** Medium – approximately 1/3 of the total program/department/division's initiatives by resource category (personnel, equipment, etc.)

**L:** Low – approximately 1/3 of the total program/department/division's initiatives by resource category (personnel, equipment, etc.)

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**7. Process Assessment and Appeal**

**7A. Purpose of Process Assessment**

The purpose of program review assessment is to evaluate the process for continual improvement. The process is required for accreditation and your input is very important to us as we strive to improve.

**7B. 2012 - 2013 ASSESSMENT QUESTIONS**

**1.** Did you complete the program review process last year, and if so, did you identify program initiatives?

We did perform a program review last year and identified program initiatives.

**2a.** Were the identified initiatives implemented?

Several initiatives were funded last year. The implementation of the cadaver room and Biology suite ventilation project is in progress (it is now in the engineering stage) and we have acquired formaldehyde monitoring equipment. The herbarium room equipment was funded and the herbarium room has been identified and renovated and awaits installation of equipment (cabinets, plant presses, dehumidifier, etc.). The Parscore system was funded and is pending. A new body model was purchased and is in use.

However, some of the initiatives were not funded, including the acquisition of fish chillers for Biology classes and the microscope camera systems needed in Microbiology and Biology classes; these initiatives have been rolled over to the 2012-2013 Program Review. The hiring of a FT Biology instructor to improve compliance with the AB 1725 level of 75% FT instruction continues to be a desirable contribution to the Biology Department, however due to budget constraints we are not requesting this hire at the present time.

**2b.** Did the initiatives make a difference?

The human body model is making a significant difference in instructors' ability to demonstrate musculature as well as visceral anatomy to students. We await the installation of the cadaver ventilation system, the Parscore system, and the herbarium equipment, and will need to evaluate these initiatives in next year's program review.

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**3.** If you appealed or presented a minority opinion for the program review process last year, what was the result?

We did not appeal or present a minority opinion.

**4.** How have the changes in the program review process worked for your area?

The program review process continues to be cumbersome, although the document has been somewhat streamlined.

The program review shell is provided too late for the department to conduct a meaningful analysis.

**5.** How would you improve the program review process based on this experience?

Further streamlining of the program review process would be helpful, for example the analysis of our demographics should be an institutional rather than a departmental responsibility since our demographic profiles are beyond the control of the department.

It is important that either the program review shell be provided earlier in the academic year or the deadline for completion of the program review be delayed so that there is sufficient time available to adequately review the program. Providing the shell at the same time that Department Chairs are developing the Spring schedule, the departments are developing and mapping SLOs, and other early Fall semester activities are ongoing is not optimum for focusing on program review so that it becomes a significant and well considered document.

**7C. Appeals**

After the program review process is complete, your program has the right to appeal the ranking of initiatives.

If you choose to appeal, please complete the appropriate form that explains and supports your position. Forms are located at the Program Review VC website.

The appeal will be handled at the next higher level of the program review process.