



**Biological Sciences**  
**(Anatomy, Biology, Biotechnology,**  
**Microbiology, Physiology)**  
**Program Review**  
**2013-2014**

**2013-2014 Program Review for Biological Sciences**

Submitted October 7, 2013

**Section I – Accomplishments and Status of 2012 Program Review Report**

**A. Last Year's Initiatives.**

**Non-funded Initiatives:** While it is difficult to ascertain the specific contribution to student learning, completion, retention, and success rates, and other performance indicators resulting from the infusion of activities from a specific initiative into the classroom, the Biology Discipline has made a variety of initiative-based changes/improvements to enhance instruction that have had a positive impact on student learning. Increased writing assignments in Anatomy and other courses have contributed to those students meeting their ISLO goal in writing communication. Ongoing collaboration on laboratory curriculum between instructors as well as with laboratory tech staff has led to improvement of laboratory experiences in several courses, including Anatomy, Physiology, Microbiology, and several Biology courses. Weekly meetings between course coordinators and laboratory tech staff to discuss and improve laboratory exercises, and uploading of those lab activities into Sharepoint for continued monitoring and improvement by instructors has improved lab experiences for students. Continuing examination of textbooks and matching of those textbooks to the objectives and curriculum found in course CORs has led to the adoption of texts that are appropriate in reading level, curriculum topics, and that provide publisher supported online learning experiences that augment student learning. Expanded use of Tegrity has provided a learning support system for many of our students. Working with the Dean and with the support of the Ventura College Foundation, instructors will have access to a digital projection microscope that will improve instructor presentations in Microbiology, Anatomy, Introductory Biology, majors Biology, and other courses. Regular Biology Discipline meetings and course-specific instructor meetings provide an opportunity for communication between instructors on issues such as textbook selection, SLOs, instruction, curriculum, program review, and other issues. Four instructors have completed the D2L online training provided by Distance Education and three of these instructors presently teach online sections. One of these instructors has provided a flex activity in the use of D2L. Outreach to local industry for support and guest speakers in Biotechnology and other classes have added real-life sophistication to instruction. Collectively, these activities have no doubt had a positive impact on instruction and student learning, although it is difficult to quantify.

We as a department continue to focus on assessing student skills early in the semester in order to provide students with the opportunity to improve throughout the semester.

**Funded Initiatives:** The acquisition and refurbishing of equipment and facilities has had a significant impact on instruction. The refurbishing of microscopes in the Microbiology lab has enabled students to better observe microbes and perform various microbiological techniques. We have added a herbarium that will allow for the preparation, classification, and proper storage of plant specimens for observation in various courses. The installation of improved osteology storage facilities will contribute to the preservation of expensive specimens that will permit students to observe structures not possible when those structures are damaged. Our new x-ray viewer allows for observation of x-rays to augment the discussion of bone and joint structures as well as familiarize students to diagnostic protocols. The use of new fish chillers has allowed the Introductory Biology instructors to better compare relationships between poikilotherms and homeotherms, an understanding of which augments the investigation of evolutionary relationships as well as contributes to a better understanding of ecological relationships.



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The Biology Discipline awaits the acquisition of an Insight 4ES scanner with ReMark software from Scantron Corp. (comparable to the Parscore system) to replace the old Scantron grading system, which will enable us to better analyze exam results and therefore modify instruction and/or exams to better meet the needs of students. This initiative has been funded and awaits implementation. We also await the completion of a new ventilation system in the cadaver room that will allow students to again enter the room for vital anatomical observations.

Training of the laboratory tech staff on the care of microscopes and use of the scanning electron microscope has awaited the hiring of a new laboratory technician (now complete) and will now go forward.

The hiring of a new full time instructor in Biology will continue to be a concern for the department. While part time instructors provide a vital and outstanding contribution to student learning, there is need to hire one or possibly two full time Biology instructors to cover class offerings, provide office hours, attend department meetings, contribute to the college community, etc.

**B. Updates/accomplishments pertaining to any of the Student Success or Operating Goals from last year's report.**

The Biology Discipline's FY 2013 student success goal was to maintain or improve the program's prior three-year retention and success rates. Student success outcomes have significantly improved in most course categories (BIOL, ANAT, and MICR) in the fiscal year 2013 as compared to fiscal year 2012. For all BIOL courses, the retention rate of 84% exceeds the three-year average of 81%, and the success rate of 66% exceeds the three-year average of 60%. In ANAT, the success rate of 71% exceeds the 69% three-year average, while the retention rate remained at 82%. In MICR the retention rate of 85% exceeds the three-year average of 83% while the 72% success rate remained at 72%. In PHSO the retention rate of 85% was down from the three-year average of 89%, but still consistent with the overall college retention rate of 86%. The PHSO success rate was down from the three-year average of 80% to 75%, but still five percentage points above the overall college three-year average. The lower retention and success rates in PHSO is likely due in part to the increase in learning expectations motivated by earlier high rates, but will provide an opportunity to focus on improving these numbers in the FY 2014 year. The low student numbers in ANPH make it difficult to ascertain any statistically significant conclusion in this course. Although it is higher than the three-year average, the 66% success rate for students in biology classes is nonetheless low, and one of the challenges for the Department in the '13-'14 academic year (and therefore an important initiative for PR '13-'14) will be to focus on and improve success rates for students in all of our classes. Since BIOL V01 has been removed as a prerequisite to ANAT V01, it will be important to monitor the FY13-FY14 ANAT V01 retention and success rates and compare these to past rates to determine the effect of this prerequisite removal.

**Section II - Description**

**A. Description of Program/Department**

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



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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

**B. Program/Department Significant Events (Strengths and Successes), and Accomplishments**

*Instructions:*

- *What has changed over the past year (i.e. faculty, degrees/certificates, curriculum, etc.)?*
- *What is impacting the program now?*

**C. 2013-2014 Estimated Costs/Gainful Employment – for Certificates of Achievement ONLY**

| 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 |      |

**D. Criteria Used for Admission**

Open admission with no prerequisites.

**E. College Vision**

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

**F. College Mission**



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At Ventura College, we transform students' lives, develop human potential, create an informed citizenry, and serve as the educational and cultural heart of our community. Placing students at the center of the educational experience, we serve a highly diverse student body by providing quality instruction and student support, focusing on associate degree and certificate completion, transfer, workforce preparation, and basic skills. We are committed to the sustainable continuous improvement of our college and its services.

**G. 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

**H. Organizational Structure**

**President:** Greg Gillespie

**Executive Vice President:**

**Dean:** Dan Kumpf

**Department Chair:** Terry Pardee

**Faculty/Staff:**

Full-Time Instructors

|                                  |   |
|----------------------------------|---|
| <b>Name</b>                      | <b>Kamelia Algiers</b>  |
| Classification                   | Professor   |
| Year Hired                       | 2006  |
| Years of Work-Related Experience | Lab technician 1 year<br>Vertebrate Collection Curator Assistant 1 year<br>National Park Service Biotech 1 year<br>Healthcare Practice Billing Management Company 1 year<br>Undergraduate Biology Adviser 2 years |
| 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 |

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|                     |  |
|---------------------|--|
| Degrees/Credentials | B.S. Chemistry, C.Phil. Biology, Ph.D. Biology |
|---------------------|--|

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

Part-Time Instructors

|                            |                                 |
|----------------------------|---------------------------------|
| <b>Name</b>                | <b>Socorro Aguirre</b>          |
| <b>Classification</b>      | Adjunct Instructor              |
| <b>Year Hired</b>          | 2013                            |
| <b>Degrees/Credentials</b> | B.S. Microbiology; M.S. Biology |

|                            |   |
|----------------------------|---|
| <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>Carrie Biggle</b>                     |
| <b>Classification</b>      | Adjunct Instructor                       |
| <b>Year Hired</b>          | 2013                                     |
| <b>Degrees/Credentials</b> | B.S. and M.S. Cell and Molecular Biology |

|                            |                              |
|----------------------------|------------------------------|
| <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                |

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|                            |   |
|----------------------------|---|
| <b>Name</b>                | <b>Elizabeth Diaz de Leon</b>                   |
| <b>Classification</b>      | Adjunct Professor                               |
| <b>Year Hired</b>          | 1991  |
| <b>Degrees/Credentials</b> | M.S. Marine Science, Life Science CC Credential |

|                            |  |
|----------------------------|--|
| <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, CC Credential |

|                            |                            |
|----------------------------|----------------------------|
| <b>Name</b>                | <b>Stephanie Gardner</b>   |
| <b>Classification</b>      | Adjunct Instructor         |
| <b>Year Hired</b>          | 2012                       |
| <b>Degrees/Credentials</b> | B.S. Zoology, 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>          | 2000  |
| <b>Degrees/Credentials</b> | M.S. Biology, B.A. Cell and Molecular Biology |

|                       |                      |
|-----------------------|----------------------|
| <b>Name</b>           | <b>Keith Johnson</b> |
| <b>Classification</b> | Adjunct Professor    |

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|                            |      |
|----------------------------|------|
| <b>Year Hired</b>          | 1990 |
| <b>Degrees/Credentials</b> | DDS  |

|                            |   |
|----------------------------|---|
| <b>Name</b>                | <b>Behnaz Parhami-Seren</b>   |
| <b>Classification</b>      | Adjunct instructor  |
| <b>Year Hired</b>          | 2013  |
| <b>Degrees/Credentials</b> | B.S. Medical Technology, M.S. Tumor Immunology, Ph.D. Cellular and Molecular Immunology |

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

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

|                            |  |
|----------------------------|--|
| <b>Name</b>                |  |
| <b>Classification</b>      |  |
| <b>Year Hired</b>          |  |
| <b>Degrees/Credentials</b> |  |

Technical Staff

|                       |  |
|-----------------------|--|
| <b>Name</b>           | <b>Sheena Billock</b>                  |
| <b>Classification</b> | Instructional Laboratory Technician II |
| <b>Year Hired</b>     | 2008                                   |



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|                                  |   |
|----------------------------------|---|
| Years of Work-Related Experience | 5 years as Research Technician,<br>4 years as Instructional Laboratory Technician |
| Degrees/Credentials              | B.S. Biology, M.S. Biology  |

|                                  |   |
|----------------------------------|---|
| <b>Name</b>                      | <b>Carol Smith</b>  |
| Classification                   | Instructional Laboratory Technician II                              |
| Year Hired                       | 2013  |
| Years of Work-Related Experience | 12 years Research Lab Tech/Manager, 12 years Instructional Lab Tech |
| Degrees/Credentials              | B.S. Genetics, M.S. Animal Science                                  |

**Section IIIa – Data and Analysis**

**A. SLO Data**

SLO assessments in the FY 2013 demonstrated that students' writing ability and ability to appropriately express scientific content are in need of improvement. Their ability to read and comprehend scientific literature and subsequently provide written responses to essay prompts is also lacking. One of the initiatives from FY 2012 was to work on students' writing skills, and it will again be the intent of the Biology Discipline to continue assigning more essay writing and work on student writing skills, consistent with the ISLO on communication. We need to provide instructor training in the teaching of writing and implement ideas provided in that training. The anticipated outcome from this training and additional student writing is that students will improve their writing skills and ability to express in written form comprehensive responses to writing prompts about scientific literature. As writing is a powerful learning modality, students will benefit from increased writing activities. It is expected that student success will improve as a result of our initiative to continue requiring additional writing in the classroom.

Another finding from our SLO data is that students' understanding of concepts/curriculum taught in the classroom are in need of improvement. This is directly tied to success rates of students in our courses. One of the non-resource initiatives we will enact will be to expand the use of D2L and other online resources, as well as the use of Tegrity, to provide opportunities for students to prepare in advance for classes and review lessons taught in class, as well as receive grade feedback, links to important online learning sites, curriculum materials, etc. It is expected that these extra opportunities and exposure to curriculum will enhance learning, contribute to higher success and retention rates in our classes, and better serve our students.

See below for specific information on retention and success rates and the Department's plan to improve these performance indicators.

**Several initiatives not requiring resources that may increase student learning/understanding of concepts/curriculum include:**

Encourage D2L supplementation of courses.

Encourage the use of Tegrity and/or other online media to provide lessons, lesson reviews, safety and introductory lessons, and potential flipping of classrooms.

Implement appropriate Title V grant ideas and launching of a Biology task force on student retention and success to identify and address pedagogy related to student retention and success.

Encourage increased writing in all courses.





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Increased campus wide Biology presence through implementation of Darwin Day activities, a Biology Colloquium, annual campus wide essay contest on topics related to biology and environmental issues, involvement in Earth Day, increased Biology club activities involving the campus community, campus wide Pre-Health club activities, and others.

## Several initiatives requiring resources include:

Acquisition of a set of 27 Microbiology microscopes to replace the decades old microscopes presently being used (and too old to be repaired due to unavailability of repair parts).

Acquisition of a Microbiology ultra-low freezer and two refrigerators to store bacteria and cell cultures, media, etc. to allow for more efficient and cost effective provision of supplies to the classroom.

Installation of HD projectors in Biology classrooms and video cards in instructional computers to augment the already funded or existing instructional camera microscopes to better project images in the laboratory.

Hiring of a new FT faculty member with expertise in Biotechnology, responsible for community outreach to and collaboration with industry to coordinate the Biotechnology program.

Restore Instructional Laboratory Tech II positions to 12-month positions to better provide support services to instructors and students in the laboratory.

Acquisition of instructional models for use in the LRC Tutor Center for outside class time study.

Restore Division clerical staff to better support instructional staff by expediting purchases requisitions, assisting in scheduling instructor evaluations and meetings, assist in the development of instructional schedules, coordination of student petitions, and a multitude of other activities essential in organizing Division logistics.

Increase Testing Center hours from 16 hours (40%) to 40 hours (100%) per week to better meet the needs of instructors needing testing services in later afternoons and nights.

Student learning in Biology is enhanced by exposure to laboratory exercises using cutting edge equipment and materials, appropriate extra classroom support systems such as D2L and Tegrity, in classroom use of appropriate technology such as camera microscope projections of biological specimens, equipment such as high standard microscopes, and support of instructional and classified staff. In turn student retention and success are directly related to student learning. Each of these initiatives listed will contribute to student learning by improving learning opportunities and access to equipment and materials appropriate to hands on experiences.

The Biology Discipline completed its 5-year rotational SLO plan in April, 2013 and entered the plan into TracDat. Mapping to PSLOs as well as ISLOs has been completed.

## B. Performance Data

### 1. Retention – Program and Course

The retention rates in most of our courses are similar to the college average of 86% and to their own 3-year averages. This is true for our large enrollment GE courses (BIOL V01, BIOL V01L, and BIOL V12) as well as for the courses that serve primarily as nursing prerequisites (ANAT V01, PHSO V01, and MICR V01). Some courses (ANPH V01, BIOL V03, BIOL V10, BIOL V23, BIOL V29) had retention rates somewhat lower than the college average, but also have lower enrollments, making it more difficult to draw conclusions from one year's data. In at least one case (BIOL V03) the low retention rate appears to be a single year anomaly and another (BIOL V29) seems to fluctuate significantly between years. In most of our courses retention rates are similar when comparing students recorded as Hispanic and White (the only two ethnic groups with sufficient samples for comparison). Our largest retention gap was in ANPH V01 (27% higher retention rate in whites). Our next two highest retention gaps showed higher retention rates in Hispanic students (10% higher in BIOL V01, and 9% higher BIOL V18). The cause of the retention gap in ANPH should be investigated and improved, though it should be noted that the success gap is much smaller (7% higher in whites).

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In most courses a minor gap in retention rates between Hispanic and White students becomes a chasm when looking at success rates (e.g. BIOL V01 retention = 2% higher in whites, success = 14% higher in whites; BIOL V18 retention = 9% higher in Hispanics, success = 33% higher in whites; BIOL V23 retention = 2% higher in Hispanics, success = 29% higher in whites). It is known that these problems in retention have a complex character which often include, to different degrees in different classes, (un)readiness for college (differing preparation in K-12), greater economic difficulties, very different expectations and social pressures for Hispanic students, and major differences in useful Internet access and the ability to use the computers ("digital divide"). Our concern is that in some courses Hispanic students may not have a clear picture of their chance of success in a course as the drop date approaches; though we do recognize that in some cases the differential is reversed (BIOL V10 and ANPH V01).

We propose to improve retention, and success, across all courses through two complementary practices. First, we will seek to increase the number of classes where Desire 2 Learn (D2L) is used to support student learning outside of the classroom. D2L can be used to provide study materials, supplementary lectures, pre or post-class assessments, and a grade book in which the students can directly track their progress. Such methods should be effective in assisting students in non-majors courses where students' lack of college-level preparation may require additional, out-of-class instruction and assessment time. In addition, a first conversation has been held with ESRM about devising a possible basic skills class to precede BIOL V23 and/or ESRM offerings to help with this lack of preparation. Another practice will be to take measures, including the use of a D2L (or other) grade book, to make students more aware of their progress and performance and to be more obvious and frequent in addressing performance shortfalls with classes, particularly when there is time to improve. Finally, we hope to leverage resources associated with the Title V Velocidad grant by making our students, both Hispanic and non-Hispanic, aware of tutoring opportunities and other support resources on campus.

## **2. Success – Program and Course**

The Biology program's success rate is slightly lower than the college overall success rate. The difference between the Biology program's FY13 success rate (66%) and the College's FY13 success rate (71%) is only 5%. It is important to note that there was a 6% increase in success rate in FY13 as compared to the prior 3-year Biology average, which is a sign that the program is bridging that small college/department gap. It is anticipated that the Biology Program's success rate will continue to improve, hopefully to exceed the college wide level. It is to be noted that comparing the Biology program average to the college average is appropriate only when comparing it to other program averages that have courses of comparable difficulty, and which enroll students of comparable preparation. Lower success rates in Biology might reflect the difficulty of the subject matter rather than deficiencies in the program itself.

When comparing the Biology Discipline's success rate for the past three years to that of the College's, the Discipline had a 10% lower success rate. However, Microbiology and Physiology have consistently scored above the college's success rate.

When surveying the disaggregated data by gender, it is clear that a higher number of females than males enrolled in Biology. For Biology in general, the female-to-male ration is about 6:4; for MICR V01, the ratio is about 8:2; and for PHSO V01, the ratio is about 7.5:2.5. The class that stands out as having the opposite effect (i.e. less female students than male students) is Anatomy and Physiology with a ratio of about 4:6. Compared to the last 3 years, the number of female students enrolled in Biology, ANAT V01, and PHSO V01 seems stable, whereas that number seems to be decreasing slightly in MICR V01, and increasing slightly in ANPH V01.

When surveying the disaggregated data by age, students taking Biology or ANPH V01 tend to be around 25 years of age; students taking ANAT V01 tend to be about 27, and students taking MICR V01 or PHSO V01 tend to be about 28 years old. These numbers seem to correspond to the number of prerequisites needed for MICR V01 and PHSO V01 as compared to those needed to take courses such as BIOL V01. Compared to the results obtained in the prior three years, the average age seems to have remained stable at 25 for Biology, 27 for ANAT V01, and 28 for PHSO V01, and decreased for MICR V01 (from about 29 to 28).



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The Whites and Hispanics represent the greatest number of students in the Biology Discipline. Of these, the students that identified themselves as being ethnically White had a higher success rate as compared to Hispanic students, in all but three courses: BIOL V04, BIOL V10, and Biotechnology. It is difficult to conjecture as to why. However, some possible reasons for the pattern seen in BIOL V04 include:

Some of VC's most highly motivated students, no matter what their ethnicity, enroll in BIOL V04. These students are mostly second semester students, i.e., they been together for at least a semester (in BIOL V03). They've formed strong academic ties (study groups) and spend almost 9 hours a week together in the Biology major's classes. They've formed strong social as well as academic ties, crossing ethnic boundaries, by their participation in MESA, AGS, and/or VC Pre-Health Club. Other activities that can involve some: internships at local health care providers, tutoring, etc. MESA involvement gives them other advantages: a place to study together (sometimes including some non-MESA students), someone else (besides their professors) who is involved in and concerned with their academic progress, and laptop computers they can borrow and take home for their assignments (for some, this is the first/only computer they've had for their personal use - several have told me how much this mattered to them). Since my last tale of borrowed laptops making a huge difference is from a student last year, digital inequality is still a problem. All of those contributions by MESA lead to greater student retention and success. If we could duplicate some of these MESA features in other classes/areas of the college, I think we'd see greater retention and success with our other students.

Although the low enrollments make it difficult to draw a statistically significant conclusion, it is also interesting to note that Asian students met (and often exceeded by far) the College's 70% success rate in all of the Biology disciplines.

The success rates at the college level are around 70%. At the discipline level, the success rate was slightly higher for MICR V01 (72%) as compared to the college's success rate. The success rate for PHSO V01 was about 10 percentage points higher. The success rate for ANAT V01 was lower than the college's 70% success rate by about 11 percentage points, but the percentages for overall Biology courses (66% in FY13) was significantly lower than the college's success rate. It is to be noted that Biology increased success rates from 60% for the prior 3-year average to 66% for FY13, but ANPH V01 decreased from 63% for the prior 3-year average to 43% in FY13 (possibly a statistical anomaly due to the low enrollment in this course). Both of these numbers are less than the college's 70% success rate.

Initiatives to improve success rates include use of D2L in more courses, use of Tegrity in more courses, incorporation of ideas from the Title V Velocidad grant project, possible use of clicker technology, flipping classrooms, designing a class that focuses on basic biology, chemistry, and math skills (perhaps as an Adult Ed collaboration or as a community service course), possibly re-hard linking BIOL V01/V01L and/or BIOL 29/29L, outreach/advisement to non-majors (particularly BIOL V01/V01L), and efforts by the department to identify causes for the lower success rates.

### **3. Program Completion – for “Programs” with Degrees/Certificates Only**

For **Biology**, the highest completion overall occurred in FY 11 (9 AA degrees). Last year's program review attributed most of that result (and its buildup in the preceding year) to the contributions of the dedicated STEM Grant Counselor, Gema Espinoza. FY12, without the STEM Grant and its counselor, saw a marked reduction to 3 AAs, but there was a later increase in FY 13 of 5 AAs and 3 Certificates. This recent increase is probably due to 3 factors: the implementation of the DegreeWorks software for students and counselors to help both keep better track of a student's total coursework and progress toward a certificate and/or degree, a concerted effort by counselors to increase students' awareness of degrees and certificates, and regular beginning-of-the-semester announcements in BIOL V03 and V04 about Biology degrees and certificates. Over the last 4 years, females have earned about 65% of the awards and have been particularly well represented in FY11 and FY13. It is important to note that many majors biology students transfer to four year universities and colleges prior to completing the AA degree.

Use of the disaggregated ethnicity data is somewhat problematic as it is unclear whether the same ethnic categories were used



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in all years. However, looking at the data for Hispanics a few observations can be made. Since the STEM counselor's mandate was to work with Hispanic and first generation students, in FY12 Hispanics represent 56% of the awards that year, and 67% for FY10, whereas the pattern since that time has been 50% (FY13) or less (FY12) of the awards are earned by Hispanics. Clearly having counseling specific about Biology and STEM majors targeted to Hispanics in FY10 and 11 made a difference for that ethnic group. As for gender representation, females clearly have earned more awards (almost twice as many as males). There may have been an effect from having women as counselors and instructors.

With more and better information now available to students about how to complete a degree or certificate, we have been seeing an increase. Based purely on voluntary accounts of students to the Biology majors instructor as to where they are planning to transfer, etc., the numbers are "in-the -ballpark" to the numbers of students identifying as CSU transfers. One problem with increasing these numbers has been identified: CSU transfer in Biology often has a somewhat different recommended coursework than UC transfer (i.e., CSUs recommend physics and UCs desire Organic Chemistry). The Biology majors' students much more often name UCs as their target as compared to much of the rest of campus, which has more of a CSU-preference. Most of our students would rather not prepare for both as that often takes them well beyond the 60 units recommended for transfer. One possible solution has been suggested by VC's articulation counselor: make our Biology AA degree a little more flexible by instituting an "or" for what is now a physics requirement to include Organic Chem as an option.

For **Biotechnology**, while this program is a small one on our campus, it continues to award some AS degrees and certificates each year. In the past 4 years a total of 11 degrees and certificates have been awarded in biotechnology (eight degrees and three certificates). FY13 provided the greatest number of those within the last four years (four degrees and one certificate in FY13, two degrees and two certificates in FY12, none for FY11, and two degrees in FY10), so it could be that it has grown a little and/or the changes in counseling (DegreeWorks, more focus on earning awards) have been beneficial to this program as well. Hispanics and females have earned over half of the awards for this program (6 females, 5 Hispanics).

Our program became smaller in part due to the following: the addition of the masters in biotechnology program at CSUCI (as well as their biotechnology course offerings), the hiring of and work by a dedicated faculty member at Moorpark's Biotechnology Manufacturing program (Subhash Karkare, formerly of Amgen) and faculty downsizing at our campus which led to the retirement loss of our one full-time faculty member with significant duties in Biotechnology without replacement (Prof. Bill Thieman). The student population we serve has changed; the post-baccalaureate (re-training) population, once half of our students, has become scarce, although this may not have made a major impact on the numbers of awards since many of those students only require 1-2 courses before they often can get a biotech job. There have been major changes in our local biotechnology community as corporate down sizing, mergers, take-overs and others (including the economic recession) have led to changes in the numbers and types of entry-level positions, and greater uncertainty in our students. This program needs the attention of a full-time faculty member, not only for instruction, but also for student advisement to help increase retention, success and completion rates, consultation/coordination with local companies, and outreach.

## C. Operating Data

### 1. Demographics - Program and Course

Although the numbers of Asian, African American, Filipino, and Native American students enrolled in Life Sciences courses are fairly low and therefore difficult to draw statistically significant conclusions from, there are general trends that can be seen in the data for Hispanics and Whites.

The student demographics in the Biology discipline roughly parallel the demographics college wide. The previous 3-year average for Biology classes shows 43% Hispanics, 38% Whites, 3% African Americans, and 4% Asians as compared to college wide numbers for the previous 3 years of 45% Hispanics, 37% Whites, 4% African Americans, and 3% Asians. These numbers are statistically comparable. Other Ethnicities are too low in enrollment to draw statistically significant conclusions from. For

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Anatomy, the 3-year average shows 37% Hispanics, 41% Whites, 2% African Americans, and 5% Asians. For Microbiology, the 3-year averages were 33% Hispanics, 43% Whites, 2% African Americans, and 5% Asians. And for Physiology, 35% are Hispanics, 42% are Whites, 2% African Americans, and 4% Asians. Thus in overall Biology courses, enrollments for Hispanics are higher than for Whites and comparable to the college wide numbers. However, for specialty courses such as Anatomy, Physiology, and Microbiology, which represent a pre-allied health professional track, enrollments for Whites exceed those for Hispanics and the overall college numbers.

For FY13, the enrollment numbers for Biology courses and college wide are nearly the same for Hispanics and Whites (51% Hispanics for both Biology and college wide, and 32/33% for Whites in Biology and college wide, respectively). For Anatomy, Physiology, and Microbiology the numbers for Whites exceed the college wide numbers, and for Hispanics the numbers are significantly lower (7%, 11%, and 21%, respectively for the three courses). More Whites are being enrolled in the pre-allied health professional track than Hispanics, but more Hispanics enroll in overall Biology courses.

An examination of retention and success data for FY13 reveals a general and continually alarming trend that is not consistent with the overall demographic data. In Biology courses 51% of the enrolled students are Hispanics and 33% are Whites, and the retention rate for Hispanics is 82% and for Whites is 84%; however, the success rate for Hispanics is only 55% and for Whites it is 69%. Similar numbers are seen for Anatomy, Physiology, and Microbiology as well, success rates being uniformly lower for Hispanics as compared to Whites. There is a need to address the needs of Hispanic students in Biology discipline courses. The Title V Velocidad grant is focused on this issue, and two FT faculty from Life Sciences are Title V committee members and involved in this endeavor.

No significant difference exists in average age for Biology classes as compared to the college averages. The prior 3-year average age of students at the college is 26 years (24 years for FY13). For Biology the prior 3-year average is 25 years and FY13 is identical to the college average.

There is a significantly higher percentage of females enrolled in Biology classes as compared to the college, both for the prior 3-year average as well as for FY13. For the Biology prior 3-year average 63% of the students were female, whereas for the college prior 3-year average only 54% of the students were females. For FY13 the percentages are identical to the prior 3-year average.

Ethnic demographics for Biology are comparable to the college averages, both for the prior 3-year average as well as for FY13. Interestingly, both for college wide and Biology the numbers of Hispanics has grown significantly. In FY13 51% of students were Hispanic both for Biology and college wide, as compared to the prior 3-year average of 43% for Biology and 45% college wide. The number of Hispanic students has increased at VC, more so for Biology than college wide (by 2 percentage points). The number of White students has decreased by 5 percentage points for both Biology and college wide.

There is no need to diversify the Biology offerings to address age disparity (which does not exist). However, the number of White students in both Biology and college wide is down in FY13 as compared to the increased numbers of Hispanics, showing a trend down for Whites and up for Hispanics. It is unknown why White student enrollment in Biology is down by 134 students as compared to an increase of 163 Hispanic students in FY13 (referenced to the prior 3-year average). Although these trends may be representative of the feeder population, it may be that better outreach to Hispanics is having a positive effect on that population. In addition, although male student enrollment has not shown a significant change in Biology as well as college wide in FY13 as compared to the prior 3-year average, male enrollment remains significantly below female enrollment in both Biology and college wide. As this cannot be representative of the general feeder population, it would be interesting to investigate why this demographic is so.

Hispanic enrollments in Biology are on the up trend and Hispanic enrollment (51%) exceeds all other ethnic groups combined. Female enrollment exceeds that of males by nearly 2 to 1. The Biology discipline does not propose any initiatives to change these demographics, although a college wide investigation as to why enrollments are lower for Whites and males should be conducted, as it is important to serve all ethnicities, genders, and ages. We are, however, concerned about the lower success rates (and in some but not all cases the lower retention rate) of Hispanics as compared to other ethnic groups. We propose to



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closely examine ideas generated by the Title V Velocidad grant as well as to initiate a department "task force" to determine how to improve retention and success rates for all our students, including (and perhaps especially) Hispanics.

Retention and success data for ANAT V01, PHSO V01, MICR V01 roughly reflect the data above for overall Biology (with some variation between courses), although some of the demographics are different (addressed above).

**2. Budget**

- Program members have reviewed the budget data.
- No comments or requests to make about the budget

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 infrastructure, 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.

The total expenses for Biological Sciences trended upward from FY10 to FY12, and has from there declined to a low in FY14. The FY13 total expense budget for Biological Sciences was 4.2% below the 4-year high in FY12, and the budget in FY14 is projected to be 11.8% below the FY12 high, and is 5.5% below the previous 4-year low in FY10. Student hourly was down in FY13 as compared to FY12, and is projected to be significantly below the FY13 budget in FY14 by another 35.6%. The supply budget in FY 2010-FY13 remained fairly consistent, although in FY13 the supply budget was up by 13.0% as compared to FY12. In FY14 the supply budget is projected to drop to a 5-year low, 19.9% below the FY13 budget. The equipment budget rose dramatically in FY12, then declined in FY13 to 178.5% of the FY10-FY11 average, and in FY14 is projected to drop to 0.

For General Biology, the budget past 5-year was highest in FY10 (with significantly higher FT faculty budget in FY10 as compared to subsequent years), took a significant downward trend in FY11, was up slightly in FY12 (due to higher classified and student hourly budgets and a significant increase in equipment budget), and has declined since FY12 to a 5-year low in FY14 (7.5% below the previous 4-year average). With fluctuations, the supply budget has trended upward, with a high in FY13; the FY13 supply budget was at a 4-year high, but will drop from that FY13 high by 21.1% in FY14.

For Microbiology, the total budget has remained fairly consistent since a low in FY10, with a slight increase in FY13 and FY14, largely due to increased PT faculty budget.

Anatomy and Physiology has experienced strong budgetary fluctuations, but in FY13 was less than 1% off from the previous 3-year average (but significantly lower than the FY12 budget by 18.0%); The FY14 budget is still lower by 18.6%, largely due to a reduced FT and PT faculty budget. There is a strong funding of PT faculty as compared to FT faculty in this area.

Biotechnology has remained consistently and poorly funded during the past 4 years, although in FY13 and FY14 there is a fairly significant (but still low) increase in budget due to the funding of a PT faculty member (artificially suggesting increased funding).

Overall there has been a downward trend in total funding in Biological Sciences that reflects reduced budgets in FY13 and FY14 as compared to the previous high in 3-year averages. Reduced budgets for supplies, student hourly, and classified staff, coupled with high enrollment numbers in many Biological Sciences classes, are detrimental to the life science experiences of students. Additional funding for supplies (to offset the 5-year low in FY14) and equipment (trending downward significantly since the unusually high infusion of equipment for Life Sciences in FY12, and budgeted at 0 for FY14), are needed to provide cutting edge laboratory experiences for students and subsequently improve student learning, retention, success, and completion rates. As equipment becomes obsolete and in a state of disrepair, and as funding for expendable materials is reduced below the threshold necessary to supply the needs of labs, student experiential learning is harmed. To that end we



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request that a maintenance budget separate from the Biology Department budget be provided to maintain existing equipment, that the FY14 funding for supplies (proposed at \$21,521) be restored at least to the FY13 level (\$26,851), and that the funding from equipment for FY14 (\$0) be restored to the FY13 level (\$12,072).

### **3. Productivity – Program and Course**

In general, the biology program has one of the highest productivities on campus, especially considering the design of the lecture-lab composition and the limited enrollment by laboratory space. Lab courses are capped at 24 students due to safety, limitation of supplies, as well as the nature of the discipline all contribute to lower productivity, and yet the Biological Sciences has consistently met or surpassed District goals. There has not been a strong change in productivity in the Biological Sciences for FY13 as compared to the prior 3-year average, although our FY13 WSCH ratio is 608 as compared to the 3-year average of 597, indicating a small increase in productivity.

#### Anatomy (ANAT V01)

Our Anatomy course has an FTES of 96, which is down 4% from the 3-year average (100). Our WSCH for Anatomy is at 706 for FY13, up 3% compared to the 3-year average of 682. With the district goal being at 550, we are at 128% of our goal. The small change between FY13 and our 3-year average is minimally significant.

#### Intro Human Anatomy & Physiology (ANPH V01)

FTES for ANPH is at 13, which is the same as the 2-year average. However, the WSCH Ratio is at 378, which is 16% above the 3-year average (368) suggesting there has been a small increase. Although the WSCH ratio is lower than the District goal of 650, this course is unique. One section of lecture and lab are taught each semester, as it is a required course for VC's Paramedic Studies program and programs such as radiology tech, phlebotomy, and others (not all offered at VC). It is capped at 24 students (due to lab restrictions) and the class size at present meets specific needs of an important college program.

#### Biology (63 sections)

Biology's FY13 FTES is at 271, which is down 2% from the 3-year average of 276. This decrease may be due to a decrease of 43% in extra large faculty (0.85 in 2013 while 1.48 in the 3 year average). The decrease in the extra large classes in BIOLV01 may be responsible for a slight decrease in productivity in that class, as it may have been for other courses as well. However, BIOLV01 is still at 120% WSCH goal (721 ratio compared to the 733 ratio for the 3-year average and well above the District goal of 600). WSCH ratios for all other courses have either shown no change or have increased, with the exception of BIOLV14 (which was cancelled in Spring 2013, rendering data meaningless for FY13 for that course), BIOLV18/BIOTV18, which was down 9% (675 compared to the 3-year average of 710, but still significantly higher than the District goal of 600), and down 4% for marine biology lab (BIOLV29L). One section of BIOLV18 is offered each semester, and although the WSCH ratio is slightly down in FY13, it is still significantly above the District goal of 600. In addition, the data do not represent the students enrolled in BIOT V18 (cross listed with BIOL V18 and therefore the same section), and therefore the WSCH ratio is low and does not accurately represent the true WSCH ratio for the course. Enrollment in BIOLV29L is capped at 24 students, and furthermore the lab is not hard linked to the lecture. Students may take the lecture for GE credit without enrolling in the lab section. Hard linking of the courses may increase the WSCH ratio in this course. However, the high WSCH ratio for the lecture more than compensates for the lower WSCH ratio for the companion lab (needed by many of the marine biology students).

#### Biotechnology (BIOL/BIOT V30, BIOL/BIOT V31)

Biotechnology is a small program that includes one course (BIOTV18) which doubles for both a natural science GE course and a biotech degree, and 3 other courses that are specifically for the biotech degree and training students in biotechnology. WSCH for FY 13 is at 396 for the program, which is lower than the 3-year average of 436. Our biotech courses have relatively low enrollment but fulfill a specific program need. Three of the four BIOT courses are included in a degree or certificate program, and the 4-year total for the number of degrees and certificates is 11. Some of these students may go into the workforce before



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finishing their degree or certificate, and it is believed if this were not the case the numbers of awards would be higher. Still, the numbers of degrees/certificates is essentially the same as the 12 awards per four year time span expected by the District. These courses have taught by part time faculty for years. Without a full time faculty member advertising the program, recruiting students, collaborating with nearby universities (ex: CSCI, UCSB), and collaborating with agencies who can offer students internships while taking classes to further their education at VC (ex: Coastal Marine Biolabs, AMGEN), we may continue to have trouble filling the courses, awarding certificates and degrees in the discipline. Currently, the 4 full time faculty at VC are stretched too thin to give the needed attention to this program. Another FT faculty with responsibilities including coordination of the Biotechnology program would be beneficial and boost productivity.

## Microbiology (MICR V01)

In microbiology, our FTES is at 58 for FY13, which is down 17% from the 3-year average (69). The WSCH ratio for MICR V01 for FY13 is 495, down from the 3-year average of 602, but somewhat higher than the District goal of 480.

## Physiology (PHSO V01)

The WSCH ratio for PHSO V01 for FY13 is 762, somewhat above the 3-year average of 694 and well above the District goal of 500. The six PHSO V01 sections have consistently filled to capacity given the mandatory caps on lab enrollment of 24, and have often exceeded these numbers. WSCH ratios have without doubt exceeded District and Department expectations.

Overall, the productivity in the biology program meets our expectations. With the exception of a few one-section courses that need to be monitored in the upcoming year (ex: marine biology lab, human heredity), and the biotechnology related courses that were addressed above, the Biological Sciences productivity is up and generally above District goals.

Initiative: To allow the biotech program to have a more productive outcome, we will need a full time faculty member who can dedicate his/her time building the biotech program. Recruitment and collaboration will play an important part in growing the biotech program.

## **D. Resources**

### **1. Faculty**

While PT instructors provide excellent instruction and contributions to the department, the hire of a FT instructors in Life Sciences, as well as in other sciences, is important to student learning as FT instructors tend to be more involved in holding office hours, providing out of class study sessions, attending department meetings, acting as coordinators in the development of curriculum and revising Course Outlines of Record, tend to be more available to students one on one, etc. A new FT hire would be very beneficial in improving service to students, departmental interactions, and college and community involvement, and therefore to student learning and success. Life Sciences courses are very much impacted and a new FT faculty member would contribute significantly to ameliorating this congestion and to improving student instruction, student counseling, department collaboration, etc. There are presently four FT instructors in the Biological Sciences, and approximately 12 PT instructors (varies year to year depending upon staffing needs). We continue to need two more full-time instructors 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, however, that the hire of a second new FT instructor must wait for sufficient funding and the need for new FT hires in other departments, and therefore we are asking for the hire on one full-time Biological Sciences instructor at this time. A new FT hire in Biology is strongly recommended and requested by the department.





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The Biology discipline's FY13 FTEF is at 27.6%, much lower than the college average of 42%.

This is also lower than the 3-year average of 28% (college average of 39%). There is need to hire additional FT faculty to teach and raise the FTEF in these courses.

In ANAT V01, the FTEF for FY13 is at 53% and the 3-year average is at 63%, both well above the college average. In ANPH V01, the FTEF is zero for both the 3-year average and for FY13, since these sections have in recent years been taught by PT faculty only. ANPH V01 is a unique course as it is a requirement for the Paramedic program and other medically related programs (not all taught at VC), and thus serves the specific needs of students in that area. In PHSO V01, the FTEF for FY13 is at 51% and the 3-year average is at 46%. This course is taught by two instructors with many years of experience in this field. In MICR V01, the FTEF for 2013 is at 57% and the 3-year average is at 42%. Both these numbers are consistent with college wide numbers.

For BIOL/BIOT V30 and BIOL/BIOT V31, the FTEF is zero both for FY13 and the 3-year average. In recent years, these two courses have been taught by PT instructors, although historically these classes have been taught predominantly by FT instructors. Biotechnology is a quickly changing field, and cutting edge technology needs to get to students quickly and labs (as well lectures) need to be modified to fit the needs of current students on a continuing basis (perhaps even more so than Biology courses in general). Collaboration with other agencies, recruitment, and campus and community awareness are important components in this discipline. There is great need in Biological Sciences to hire a FT instructor whose responsibilities include coordination and teaching in the Biotechnology program.

## **1. Classified Staff**

In fiscal year 2012-2013, there was a significant decrease in the two Life Sciences Instructional Laboratory Technician II positions, decreasing from 12-month to 10-month positions. This change continues in this 2013-2014 year. Since the ILTs need to be on site for all instructional days including the intensive summer program, to satisfy the 10-month contract both technicians should be off contract on non-student days. However, time between semesters is needed to work on safety requirements and reset the labs to acceptable cleanliness and organizational standards. This decrease has had a significant impact on the ability of the lab technicians to maintain the standards of safety necessary in science labs. Specific tasks that relate to safety that have been affected include updating chemical inventory, labeling, appropriate organization of MSDS forms, lab organization and cleanliness, equipment maintenance, chemical safety, supply inventory and ordering, and formaldehyde monitoring. Other tasks that have suffered include supply inventory and ordering, updating of lab prep sheets, participation in the updating and developing lab activities, and organization of lab equipment. The number of Life Sciences class sections increased from 60 to 63 (2010 to 2013) and may likely increase in the future. The recent hire of a second Laboratory Tech II to replace a retirement earlier in the year has provided strong evidence of the contribution and benefit to student learning of our laboratory techs, and has emphasized the need to increase the Laboratory Tech II position from 10 months to 12 months. As indicated, laboratory tech preparation in the Biological Sciences is intense and time consuming (e.g., growth of cultures, creation of media, creation of solutions, providing materials for observation, organizing and repairing equipment, etc.). The present 10-month laboratory tech position has created a less than satisfactory situation in which lab tech support is at times strained. The Life Sciences Department is requesting that both Life Sciences Instructional Laboratory Technician II positions be increased from 10-month to 12-month positions as soon as possible.

There has also been a significant reduction in numbers of classified staff in the Math/Sciences Division that support the Life Sciences Department. The reduction in classified staff in the Division has placed a significant burden on existing staff to expedite clerical and other support activities for instructors. These clerical tasks are time consuming and critical to supporting the needs of not only the Biological Sciences, but other sciences in the Division as well. It is highly recommended that clerical staffing in the Math/Science Division be restored to previous levels.



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In addition, the decreased staffing of M&O has had a significant impact on the upkeep of lab spaces and cleanliness.

## **2. Inventory**

In order to ensure that the Biology Discipline has functional/current/adequate equipment to maintain a quality learning environment, the Department is requesting the purchase of a variety of resources/equipment for the '13-'14 Program Review cycle. Included in our request are the following:

The -80° freezer previously used to preserve cell cultures and various organisms, as well as DNA and other samples, has recently failed to maintain appropriate temperatures at the expense of thousands of dollars of lost materials. To replenish and maintain these vital laboratory supplies, the Biology department is requesting a small ultra-low freezer to store microbiological stocks and funds to purchase good quality bacterial stocks from American Type Culture Collection (ATCC). Our current ultra-low freezer only maintains a temperature of -65°C, but bacterial cultures need to be stored at -75°--80° C. and cannot survive in the current freezer that fluctuates up to -61°C at times. Our current ultra-low freezer is also much too large for our needs, and wastes energy. We are requesting the purchase of an ultra-low temperature freezer. We will request funds to stock the freezer with good quality bacterial stocks after we have obtained the freezer and after air conditioning is installed in the lab area, perhaps in the next year of program review.

In addition to the -80° freezer, we need to purchase a two large refrigerators or a large double refrigerator to store media, solutions, cultures, and other materials that need refrigeration without freezing. Our most recent refrigerator was a used donation and has recently failed to function. The donated refrigerator, which is a commercial 45 cubic foot unit, has never maintained temperature, heating and cooling sporadically, then freezing for a time. M&O has tried to fix it several times, but to no avail...it just doesn't work. Most of the supplies stored in it have been ruined and we cannot trust it to store supplies. We routinely run out of space to store media and have to wait until a few days before a lab to prepare media. We need to replace this refrigerator in order that lab techs can prepare cultures and media in advance on a weekly basis and store these for use in the classroom at a later time.

The current microscopes used in Microbiology (where quality microscopes are critical to the curriculum) are decades old and new parts for repair are no longer available. It will be difficult or impossible to repair these microscopes any longer. It will be necessary to replace the Microbiology set of 27 microscopes in the near future to continue offering appropriate laboratory experiences in viewing bacteria, viruses, protozoans, and other microscopic organisms and thus contribute to student learning and success. Regular maintenance is required to maintain these microscopes on an annual basis to maintain complete functionality. Other equipment (e.g., the autoclave) is in need of regular maintenance as well.

We are also requesting the renovation of instructional computers in the four Biology laboratory rooms with improved video cards and the installment of HD projectors that can project high-resolution images on the screen for instructional purposes. This renovation will improve student learning and success as a result of the instructor modeling that will be possible with the improved systems.

## **3. Facilities or other Resource Requests**

One of Biology's highest concerns 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



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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.

There are a variety of facilities requests that are either in the works or that we are requesting. We are presently awaiting implementation of a plan to install an improved ventilation system in the Biology suite. Amongst the rooms in need of ventilation renovation is the cadaver room that is in need of ventilation that meets federal standards for formaldehyde exposure. Additional ventilated areas include a chemical storage room and air conditioning to the entire lab area (the latter is presently in the works). 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.

We are requesting the renovation of room Sci-222, a project that is critical both for the purpose of improving instructional experiences of students as well as for student safety as well. The lighting in this room is extremely poor, and students cannot properly see their papers, books, etc., and have difficulty navigating the steps in a safe manner. Improved lighting would remedy these safety and pedagogical issues. We are requesting that the projection screen and system needs to be moved in order that instructors can project images and use the whiteboard simultaneously, important in the presentation of curriculum. In addition, plumbing repairs are needed to maintain the front demonstration table in a suitable condition for lecture. This project is a concern not only of the Biology Discipline, but Chemistry and other departments as well, and should be a Math-Science Division priority.

We are requesting that the projection/ computer system in room Sci-313, as well as the ambient lighting in room Sci-313 and Sci-222, be renovated to improve instruction. This should be a Math/Science Division priority.

Other resources requested include installation of a larger sink in the MICR V01 room (with DI water as well as tap water), reinstall gas outlets in sci-316, marking of exits from classrooms with photoluminescent paint, tape, and/or signs (safety item), better WiFi availability in classrooms, and increased number of Internet connections in some classrooms.

#### **4. Combined Initiatives**

As indicated above, we are requesting infrastructure changes that involve the entire Math-Science Division. Renovation of common lecture halls is important and will contribute to improved instruction within all the departments in the Division.

*Instructions:*

*Does your program have any combined initiatives that address more than one data element? If so, explain and enter the initiative with more detail in Section V.*

#### **E. Other Program/Department Data**

The Biology Department does not wish to consider any other data from other sources at this time.

### **Section IIIb – Other Program Goals and Initiatives**

#### **A. Other Program Goals**



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In addition to goals determined by examination at institutional and program data, the Biology Department is intent to make positive strides in the following areas:

- Improved communication and participation within the department.
- Improved retention and success rates through a concerted effort to identify the causes of lower than desired success rates.
- Implementation of appropriate Title V Velocidad grant initiatives within the department.
- Expanded use of D2L and Tegrity in classrooms.
- Greater focus on student writing skills.
- Greater focus on new pedagogical innovations that contribute to student learning.
- Greater focus on developing student study skills.
- Update of all laboratory safety protocols and literature. The Instructional Laboratory Technicians will ensure that our department is compliant with the Chemical Hygiene Plan, the Hazard Communication Program, and the Medical Waste Management Plan.

**Section IV – Program Vitality (Academic Senate Approved Self-Evaluation)**

The total Program Vitality score for Biological Sciences is: 19. This number suggests that many components of the program are strong and vital, but there are certainly areas that need to be strengthened. Both completion (retention) rates and success rates need improvement, as does the availability of funding to purchase much needed equipment and instructional supplies. Maintenance of present equipment and infrastructure is of critical interest to the Biological Sciences as equipment and facilities are in need of repair and renovation. Perhaps the greatest need is to hire at least one if not two FT instructors so as to improve the FT to PT ratio. The value of having an additional FT staff member has been described above. We are in need of an instructor whose responsibilities include the ability to teach Human Physiology as well as Biotechnology, and who has as a responsibility the outreach to and collaboration with industry in the community to assess community needs (a priority in the new District Master Plan).

**Section V - Initiatives**

Instructions:

Please list your initiatives below, including any you are carrying forward from prior years. Add as many as needed. Deans/division offices will put the information onto the initiatives charts. Every program/department needs initiatives that do not require resources. The hiring

Ranking:

The ranking provided below indicated the program/department's ranking. The initiatives will be ranked again later at the division level before going to the appropriate committees (i.e. technology) for additional ranking.

**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

**M** = Medium – Approximately 1/3 of the total program/department/division's initiative by resource category

**L** = Low – Approximately 1/3 of the total program/department/division's initiatives by resource category

*Example:*

***Initiative:*** Provide a brief title

***Initiative ID:*** (i.e. CD1301 = Child Development, 2013, first initiative. Maintain initiative numbers from prior program review if any are being carried forward into this new year.)



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**Link to data (Required):** From which area of data is this request associated? Within the category, be specific. (i.e. Success data for a specific course, PSLO #1, . . . , etc.)

**Expected Benefits:** What benefits to student learning or completion, etc. do you anticipate?

**Goal:** What do you believe needs to occur? (i.e. raise student success in \_\_\_\_ course)

**Performance Indicator:** What do you see as a realistic goal? (i.e. a 5% increase in student success)

**Timeline:** When do you expect to achieve this success within in the next three years? (i.e. by May 2015). These timelines will create a multi-year plan for your program/department. (a drop down menu is provided.)

**Funding Source Category:** (a drop down menu is provided)

- No new resources
- Additional general funds for hourly instruction, supplies and services (includes maintenance contracts)
- College equipment funds (non computer)
- Technology funds
- Facilities funds
- Staffing resources
- Grant funds

**Ranking:** (i.e. H) (a drop down menu is provided) Note: Your program/department will need to rank its initiatives (1/3 High, 1/3 Medium, 1/3 Low). These initiatives will be further ranked by the division.

Begin listing your initiatives here, including any you are carrying forward from prior years. Please note that every program/department needs to include initiatives that do not require resources. You may copy and paste this section

**A. Initiative:** Restore two Instructional Laboratory Technician II positions to 12 months.

**Initiative ID:** BIOL1400

**Link to Data:** Retention and success data for Biology, ANAT V01, ANPH V01, PHSO V01, MICR V01; PSLO #1; Safety

**Expected Benefits:** Improve support services to instructional staff and students by providing appropriate laboratory media and cultures; return laboratories to an appropriate standard of safety by updating laboratory safety protocols and providing a Chemical Hygiene Plan, Hazard Communication Program, and Medical Waste Management Plan.

**Goal:** Raise retention and/or success rates in above courses in the context of appropriate safety protocols.

**Performance Indicator:** On an average basis for all included courses and resulting from the collective implementation of all Program Review initiatives, raise retention and/or success rates in above classes by at least 5% over three years.

**Timeline:** 2013-2014

**Funding Resource Category:** Staffing Funds



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**Ranking:** R

**B. Initiative:** Two Microbiology Media Refrigerators and Ultra-low Freezer

**Initiative ID:** BIOL1401

**Link to Data:** Retention and success data for MICR V01, BIOL V03, BIOL V04, PHSO V01; PSLO #1.

**Expected Benefits:** Improve support services to students and faculty by providing cultures and media as well as solutions on a timely basis and with greater efficiency and lower cost.

**Goal:** Raise success rates in above courses and reduce supply expenditures.

**Performance Indicator:** On an average basis for all included courses and resulting from the collective implementation of all Program Review initiatives, raise retention and/or success rates in above classes by at least 5% over three years and reduce the cost of bacterial/ cell culture preparation by hundreds of dollars.

**Timeline:** 2013-2014

**Funding Resource Category:** Equipment-non computer

**Ranking:** H

**C. Initiative:** Remodel and Ventilation of a Biology Toxic Materials Facility

**Initiative ID:** BIOL1402

**Link to Data:** Maintenance of a safe and healthy work environment is certainly implied in the Ventura College's Vision Statement and Mission Statement.

**Expected Benefits:** Installation of toxic materials cabinets, eyewash, fume hood, and an adequate ventilation system to a room dedicated to storing and preparing toxic materials will provide for a safe and healthy working environment. In addition, this installation will move the toxic materials cabinets out of a hallway that is used for egress from the Biology stockroom and will provide for safer emergency evacuation.

**Goal:** Development of a dedicated, well ventilated, and safe room adjacent to the Biology stockroom and installation of toxic materials cabinets into the room.

**Performance Indicator:** Completion of the toxic materials facility and storage of toxic materials in the room.

**Timeline:** 2013-2014

**Funding Resource Category:** Facilities Funds

**Ranking:** R

**D. Initiative:** Re-stocking of Bacterial and Cell Cultures for Microbiology and Majors Biology

**Initiative ID:** BIOL1403

**Link to Data:** Retention and success data for MICR V01, BIOL V03, BIOL V04; PSLO #1.

**Expected Benefits:** Reduce the cost of bacterial and cell cultures for MICR V01.

**Goal:** Provide students with quality microbial organisms at a reduced cost.

**Performance Indicator:** Maintenance of bacterial and cell cultures for above classes.

**Timeline:** 2013-2014



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**Funding Resource Category:** Supply Funds

**Ranking:** M

**E. Initiative:** New Microscopes for Microbiology

**Initiative ID:** BIOL1404

**Link to Data:** Student retention and success in MICR V01; PSLO #1.

**Expected Benefits:** Improved opportunity for student observation of bacterial and other microbial specimens will enhance learning (and therefore retention and/or success rates) in the Microbiology lab setting.

**Goal:** Provide quality microscopes to Microbiology students to replace the antiquated (and un-repairable) microscopes presently used so as to improve student laboratory experience in the Microbiology lab.

**Performance Indicator:** Placement of a new set of 27 microscopes into the Microbiology lab.

**Timeline:** 2014-2015

**Funding Resource Category:** Equipment-non computer

**Ranking:** H

**F. Initiative:** Full Time Biology Faculty Hire

**Initiative ID:** BIOL1208

**Link to Data:** Retention, Success, Completion in Biotechnology, BIOL, PHSO V01; PSLO # 1-4.

**Expected Benefits:** A new FT hire in Biology will have many benefits, including improved outreach to and collaboration with industry (in support of the District Master Plan) in the context of improved completion and success rates in the Biotechnology program, increased support of student activities, increased collaboration and interaction with existing FT faculty, improved campus wide involvement of the Biology Discipline, increased ownership of Biology Discipline activities, and ultimately increased student learning.

**Goal:** Hire a new FT instructor whose responsibilities include coordinating the Biotechnology program and outreach/collaboration with industry, as well as teaching various biology courses.

**Performance Indicator:** New hire in Biological Sciences.

**Timeline:** 2014-2015

**Funding Resource Category:** Staffing Funds

**Ranking:** M

**G. Initiative:** Instructional Materials for Tutoring Center

**Initiative ID:** BIOL1312

**Link to Data:** Student retention and success in ANAT V01, ANPH V01, BIOL.

**Expected Benefits:** New materials in the tutoring center will allow students to study during non-class hours, thereby enhancing student learning and success in the above classes.



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**Goal:** Purchase of anatomical and biological models for student use in the tutoring center.  
**Performance Indicator:** On an average basis for all included courses and resulting from the collective implementation of all Program Review initiatives, raise retention and/or success rates in above classes by at least 5% over three years.

**Timeline:** 2014-2015

**Funding Resource Category:** Equipment-non computer

**Ranking:** L

**H. Initiative:** Expanded use of D2L in the Biology Classroom

**Initiative ID:** BIOL1405

**Link to Data:** Student retention and success in all Biological Sciences courses.

**Expected Benefits:** Increased access to online resources (supplemental study materials, lectures, and assessments) will increase retention and success rates, particularly for courses recognized as below average.

**Goal:** Improve retention and success rates in courses recognized as below average by adopting and fully utilizing Desire to Learn enhancement of courses.

**Performance Indicator:** On an average basis for all included courses and resulting from the collective implementation of all Program Review initiatives, raise retention and/or success rates in Biological Sciences classes that implement D2L by at least 5% over three years.

**Timeline:** 2013-2014

**Funding Resource Category:** No new resources needed

**Ranking:** H

**I. Initiative:** Writing in the Biology Classroom

**Initiative ID:** BIOL1308

**Link to Data:** Retention and success in all Biological Sciences courses; PSLOs #2 and #3; ISLO #1.

**Expected Benefits:** Increased use of writing as a tool for learning is expected to improve student analytical ability, communication skills, and learning of Biological concepts.

**Goal:** Improve understanding of biological concepts as well as student writing skills.

**Performance Indicator:** On an average basis for all included courses and resulting from the collective implementation of all Program Review initiatives, raise retention and/or success rates in above classes by at least 5% over three years; improvement of student technical writing skills and ability to communicate Biological ideas on essays.

**Timeline:** 2013-2014

**Funding Resource Category:** No new resources needed

**Ranking:** H





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- J. **Initiative:** Expanded use of Tegrity in the Biology Classroom.  
**Initiative ID:** BIOL 1406  
**Link to Data:** Student retention and success in all Biological Sciences courses.  
**Expected Benefits:** Increased access to online lectures and review snippets of classroom lectures are expected to increase student retention and success rates, recognized from the data as below average.  
**Goal:** Improve retention and success rates in courses recognized as below average by adopting and fully utilizing Desire to Learn enhancement of courses.  
**Performance Indicator:** On an average basis for all included courses and resulting from the collective implementation of all Program Review initiatives, raise retention and/or success rates in Biological Sciences classes that implement Tegrity by at least 5% over three years.  
**Timeline:** 2014-2015  
**Funding Resource Category:** No new resources needed  
**Ranking:** M
- K. **Initiative:** Investigating the Reorganization of Biology Laboratory Scheduling.  
**Initiative ID:** BIOL1407  
**Link to Data:** Student retention and success in all Biology laboratory sections.  
**Expected Benefits:** Reorganization of the laboratory class schedule will allow for better time utilization of the labs so as to increase the number of sections that can be taught in each room, thereby providing opportunity for schedule expansion and accommodation of students.  
**Goal:** Ascertain if it is possible to reorganize the Biology laboratory classroom schedule to accommodate more lab sections from the present 4 labs per room per day to 5 labs per room per day (by beginning morning labs at 7:00am).  
**Performance Indicator:** Change in laboratory classroom schedule.  
**Timeline:** 2014-2015  
**Funding Resource Category:** No new resources needed  
**Ranking:** M
- L. **Initiative:** Enhancement of Biological Awareness through Campus Wide Biological Sciences Activities  
**Initiative ID:** BIOL1408  
**Link to Data:** Student retention and success; PSLO #2.  
**Expected Benefits:** We anticipate that campus wide Biology-related activities will stimulate interest in Biology, encourage discussion and analysis of important biological topics, and stimulate student learning (and therefore student success in Biology). Darwin Day activities (speakers, discussion forums, etc.), Earth Day activities in conjunction with other departments, a Biological Sciences Colloquium series on important biological topics, Biology



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Club organized campus wide or off campus activities (e.g., bird watching, recycling, beach clean-up, etc.), Pre-Health Club campus wide activities (perhaps including cadaver demonstrations to interested students and staff), and other activities will bring Biological Sciences to the attention of students and provide opportunities to become involved in campus activities.

**Goal:** Brainstorm ideas and implement campus wide activities that fall within the domain of Biological Sciences.

**Performance Indicator:** Increased outreach to students through campus wide activities.

**Timeline:** 2013-2014

**Funding Resource Category:** No new resources needed

**Ranking:** M

**M. Initiative:** Increased Classified Staffing.

**Initiative ID:** BIOL1409

**Link to Data:** Student retention and success analysis in all Division courses.

**Expected Benefits:** The classified staff in the Math/Science Division is responsible for a multitude of activities involving the scheduling of classes, coordination of teacher evaluation and tenure meetings and clerical work, coordination of student petitions, ordering of supplies and monitoring budgets, and many other duties. There is great need to increase classified staffing to appropriately and expeditiously perform these duties, as the present limited staffing in this area has resulted in an overwhelming and daunting challenge to these critical employees.

**Goal:** Hire additional classified staff to work with present staff to adequately perform all the duties of this position.

**Performance Indicator:** Hiring of new classified staff.

**Timeline:** 2013-2014

**Funding Resource Category:** Staffing Funds

**Ranking:** H

**N. Initiative:** Increased hours of Operation of the Testing Center.

**Initiative ID:** BIOL1410

**Link to Data:** Student retention and success in all Biology courses.

**Expected Benefits:** Increasing the hours of the Testing Center from 16 hours (40%) to 40 hours (100%) will allow instructors who teach at night and other times when the Testing Center is presently closed to provide for student assessment, critical to the student learning process.

**Goal:** Increase Testing center hours to a 40 hour/week (100%) service.

**Performance Indicator:** Increased hours of operation of the Testing Center.

**Timeline:** 2013-2014



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**Ranking:** H

- O. **Initiative:** Upgrade of Instructional Computers/Projectors in Biology Rooms  
**Initiative ID:** BIOL1411  
**Link to Data:** Student retention and success in all Biology courses.  
**Expected Benefits:** Upgrading computers with new graphics cards and installation of HD projectors will allow for better projection of specimens from instructional microscope cameras in Biology labs, which in turn will improve student learning.  
**Goal:** Installation of new instructional computers w/ improved graphics cards and HD projectors in Biology rooms.  
**Performance Indicator:** Installation of equipment.  
**Timeline:** 2013-2014  
**Funding Resource Category:** Technology Funds  
**Ranking:** M
- P. **Initiative:** Discussion of Instructional Technology Reconfiguration in Sci-313  
**Initiative ID:** BIOL1412  
**Link to Data:** Student retention and success in all Biology courses.  
**Expected Benefits:** Development of a plan to improve configuration of instructional technology in Sci-313.  
**Goal:** Reconfiguration of instructional technology in room Sci-313 for improved instruction.  
**Performance Indicator:** Completion of technology renovation plan for Sci-313  
**Timeline:** 2013-2014  
**Funding Resource Category:** No new resources needed  
**Ranking:** M

**Section VI – Process Assessment**

*Instructions: Please answer the following questions:*

- A. How have the changes in the program review process this year worked for your area?**  
The reduced need to enter raw data into the document, and the population of fields prior to providing the shell to Department Chairs, has improved the process. Other than the timeline, the process has worked fairly well. Switching to a full PR on a three-year cycle will be a major positive improvement.
- B. How would you improve the program review process based on this experience?**



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Make certain all data provided to Department Chairs is accurate before dissemination. Provide the PR shell much earlier (preferably by May of the previous year) so that Department Chairs can begin the process of collecting information, communicating with their departments, and completing fields. If possible (??) make sure drop down menus work Apple computers as well as PCs.

**C. Appeals**

After the program review process is complete, your program has the right to appeal the ranking of initiatives (i.e. initiatives that should have been ranked high but were not, initiatives that were ranked high but should not have been), the division's decision to support/not support program discontinuance, or the process (either within the department/program or the division) itself.

If you choose to appeal, please complete the Appeals form (Appendix E) 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.

**VII – Submission Verification**

*Instructions: Please complete the following section:*

**Program/Department:** Biological Sciences

**Preparer:** Terry Pardee

**Dates met (include email discussions):** Department meetings on Aug 16, Sept 5, Sept 19, and Sept 26. Emails on multiple dates.

**List of Faculty who participated in the program Review Process:**

Primary participants: Terry Pardee, Marta de Jesus, Ty Gardner, Kammy Algiers, Socorro Aguirre, Carol Smith, Sheena Billock. Steve Gadbois, Patty Saito, Kim Jesu.

X **Preparer Verification:** I verify that this program document was completed in accordance with the program review process.



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**Dean Verification:** I verify that I have reviewed this program review document and find it complete.  
Dean may also provide comments (optional):



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Appendix-C

**Rubric for Instructional Program Vitality-Academic (non-CTE)**

The purpose of this rubric is to aid a program in thoughtful, meaningful and reflective self-evaluation. This rubric is also a defensible and objective way at looking at program viability and efficacy. This rubric should not be used as the mechanism to justify funding requests or for resource allocation. Lastly, a low score on this rubric does not preclude a program from requesting documented and necessary resource requests in other parts of this program review document.

**Academic programs:**

| Point Value   | Element  | Score |
|---|--|-------|
| <b>Up to 6</b>  | <b>Enrollment demand</b> <sup>1</sup>  |       |
|   | A "6" would be the ability to fill 100% of sections prior to the start of the semester.  |       |
|   | A "5" would be the ability to fill 95% or greater of class sections prior to the start of the semester for the past two terms.                     | 5     |
|   | A "4" would be the ability to fill 90% or greater of class sections prior to the start of a semester for the past two terms.                       |       |
|   | A "3" would be the ability to fill 85% or greater of class sections prior to the start of a semester for the past two terms.                       |       |
|   | A "2" would be the ability to fill 80% or greater of class sections prior to the start of a semester for the past two terms.                       |       |
|   | A "1" would be the ability to fill 75% or greater of class sections prior to the start of a semester for the past two terms.                       |       |
|   | A "0" would be the ability to fill less than 75% of class sections prior to the start of a semester for the past two terms.                        |       |
| <b>Sufficient capital / human resources to maintain the program, as defined by:</b> |  |       |
| <b>Up to 3</b>  | <b>Ability to find qualified instructors</b>   |       |
|   | A "3" would indicate that no classes have been canceled due to the inability to find qualified instructors.  |       |
|   | A "2" would indicate that rarely but occasionally have classes been canceled due to the inability to find qualified instructors.                   | 2     |
|   | A "1" would indicate that a significant number of sections in the past year have been canceled due to the inability to find qualified instructors. |       |
|   | A "0" would indicate that classes are not even scheduled due to the inability to find qualified instructors.                                       |       |
| <b>Up to 3</b>  | <b>Financial resources, equipment, space</b>   |       |
|   | A "3" would indicate that the program is fully supported with regards to dedicated class / lab space, supplies and equipment.                      |       |
|   | A "2" would indicate that the program is partially supported with regards to dedicated class / lab space, supplies and equipment                   | 2     |
|   | A "1" would indicate that the program is minimally supported with regards to dedicate class / lab space, supplies and equipment.                   |       |
|   | A "0" would indicate that there is no college support with regards to class / lab space, supplies and equipment.                                   |       |

<sup>1</sup> Enrollment demand is determined by the ability to fill classes.



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|                |  |   |
|----------------|--|---|
| <b>Up to 4</b> | <b>Agreed-upon productivity rate <sup>2</sup></b>                                  |   |
|                | A "4" would indicate that a program has met or exceeded its productivity rate.     | 4 |
|                | A "3" would indicate that a program is at 90% or greater of its productivity rate. |   |
|                | A "2" would indicate that a program is at 80% or greater of its productivity rate. |   |
|                | A "1" would indicate that a program is at 70% or greater of its productivity rate. |   |
|                | A "0" would indicate that a program is at less than 70% of its productivity rate.  |   |

|                |  |   |
|----------------|--|---|
| <b>Up to 4</b> | <b>Course completion rate <sup>3</sup></b>   |   |
|                | A "4" would indicate that the program's course completion rate is greater than 5 percentage points or greater than most recent college-wide course completion rate metric found in the annual "VC Institutional Effectiveness Report." |   |
|                | A "3" would indicate the program's course completion rate is equal to or greater than the most recent college-wide course completion rate metric found in the annual "VC Institutional Effectiveness Report."                          |   |
|                | A "2" would indicate that a program's course completion rate is up to 2 percentage points less than most recent college-wide course completion rate metric found in the annual "VC Institutional Effectiveness Report."                | 2 |
|                | A "1" would indicate that a program's course completion rate is up to 5 percentage points less than most recent college-wide course completion rate metric found in the annual "VC Institutional Effectiveness Report."                |   |
|                | A "0" would indicate that a program's course completion rate is greater than 5 percentage points less than most recent college-wide course completion rate metric found in the annual "VC Institutional Effectiveness Report."         |   |

|                |  |   |
|----------------|--|---|
| <b>Up to 3</b> | <b>Success rate <sup>4</sup></b>   |   |
|                | A "3" would indicate that the sum of the program's course success rates for the past academic year is greater than the most recent college-wide course success rate metric found in the annual "VC Institutional Effectiveness Report."                |   |
|                | A "2" would indicate that the sum of the program's success rates for the past academic year is within 4 percentage points of the most recent college-wide course success rate metric found in the annual "VC Institutional Effectiveness Report."      | 2 |
|                | A "1" would indicate that the sum of the program's success rates for the past academic year is within 8 percentage points of the most recent college-wide course success rate metric found in the annual "VC Institutional Effectiveness Report."      |   |
|                | A "0" would indicate that the sum of the program's success rates for the past academic year is lesser than 8 percentage points of the most recent college-wide course success rate metric found in the annual "VC Institutional Effectiveness Report." |   |

|                |   |   |
|----------------|---|---|
| <b>Up to 3</b> | <b>Ongoing and active participation in SLO assessment process</b>   |   |
|                | A "3" would indicate that all required courses, programs and institutional level SLOs as indicated by the programs SLO mapping document found in TracDat have been assessed on a regular and robust manner within the past academic year. |   |
|                | A "2" would indicate that 95% of all required courses, programs and institutional level SLOs as indicated by the program's SLO mapping document have been assessed on a regular and robust manner within the                              | 2 |

<sup>2</sup> Productivity rate is defined as **WSCH/FTEF** as determined by the program faculty at the college.

<sup>3</sup> As defined by the RP Group, the course completion rate is the "percentage of students who do not withdraw from class and who receive a valid grade."

<sup>4</sup> As defined by the RP Group, the success rate is "the percentage of students who receive a passing/satisfactory grade" notation of A, B, C, P, IB, or IC.



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|  |            |
|--|------------|
| past academic year.  |            |
| A "1" would indicate that 90% of all required courses, programs and institutional level SLOs as indicated by the program's SLO mapping document have been assessed on a regular and robust manner within the past academic year.           | Appendix-C |
| A "0" would indicate than less than 90% of all required courses, programs and institutional level SLOs as indicated by the program's SLO mapping document have been assessed on a regular and robust manner within the past academic year. |            |

Note rationale on next page.

In no more than two to three sentences, supply a narrative explanation, rationale or justification for the score you provided, especially for programs with a score of less than 22:

The Biology Discipline experiences high student enrollment demand and fills nearly all sections, and consequently productivity is very high. Our program's course completion and course success rates, where lower than the college's, are in part due to the nature of science classes (perceived as greater difficulty by students). We are making improvements in student success but are constrained by limited equipment and supply budgets, deteriorating equipment, equipment obsolescence, the need for a FT faculty hire dedicated in part to biotechnology, and limited laboratory tech staff (on 10 month schedules) and other classified staff. Focus on SLOs is strong in the department, although last year's timelines made it difficult to participate fully.

Score interpretation, academic programs:

- 22-26**            Program is current and vibrant with no further action recommended
- 18-21**            Recommendation to attempt to strengthen program
- Below 18**        Recommendation to consider discontinuation of the program





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