What are the strengths of your area? The Biology Department has three categories of course offerings: (1) Majors Courses (2) General Education Courses and (3) Allied Health Courses. This program review will address the academic quality, success and assessment of these categories independently and summarize workload and internal and external relationships for the entire department.

Academic Quality and Success:

(1) Majors Courses

The success rate ranged from a low of 61% to a high of 97%; in consideration of the rigor of these two classes, this compares favorably to the overall district success rate of 68% recorded in the Fall of 2013. Enrollment for these classes has increased in the past few years. While faculty have chosen to add additional students above lab capacity this is not an ideal situation because of equipment limitations, mobility and safety.

(2) General Education Courses

With the exception of one course, the overall success rates for Biology General Education courses are at or above the district rates of 67%, 69%, and 68% for 2010, 2011 and 2012. BIOL 20 and 25 had 15-20% higher success rates than district averages. The predominant trend for the success rates of each general education biology course improved each year for the past three years. Demand for these courses is consistent but limited by faculty loads which was particularly illustrated by elimination of virtually all adjunct faculty by 2011/12. This negatively impacted FTES particularly in courses which relied heavily on adjunct instructors (BIOL 20 and 21).

(3) Allied Health Courses

The academic quality is supported by three full time faculty who have PhDs in their fields. All curriculum is (or is being) aligned with C-ID. Course rigor is substantial as validated by comparison with courses on other campuses, student surveys and informal student feedback. Success is indicated by a consistent demand for classes. In spite of a drop in FTEF (BIOL 30 & 31) due to a retiree which was not immediately replaced, other faculty picked up overloads to try and compensate. BIOL 30 has the lowest success rate for any department course and is the only course below the overall District success rate in the department; however, in the past 3 years of data, the BIOL 30 success rate has increased by 8%. Success rates in all classes have improved consistently over the last three years and BIOL 31 and 40 now have success rates above those for the whole District. Success rates also show a longitudinal improvement indicated by students passing anatomy then physiology and microbiology. Improving success rates between anatomy and physiology indicate that students are developing the study skills necessary to be successful in these science courses.

Workload:

The Biology Department has consistently exceeded the State Goal for Efficiency (525) with a five year average of 585. Recently, the Biology Department Efficiency has ranged from a high of 655 (Fall 2012) to a low of 481 (Fall 2010). The lowest average Efficiency was in 2010-11 (561). In 2011-12 the Efficiency rebounded to 637. This was a result of more faculty members teaching larger lectures in an attempt to meet the demand for these courses. During this time there was a significant decrease in adjunct instructors teaching for the department. In 2010-11, 63% of the courses were taught by full-time faculty and in 2011-12 this increased to 88%. The Fill Rates also increased over that time reflecting the faculty willingness to overfill their classes (128% Fill Rate in 2011-12). Interestingly, the success rates of our students increased during this time also. Of Science Division units that also teach courses which include laboratory sections (Chem, Geol, NSci, PSci, Phys), the Biolgy Department has the highest Efficiency in the 5 year averages.

Internal and External Relationships:

The Biology Department interacts with internal support services including the MESA program which provides tutors, models and study areas for Biology students. The department also benefits from grants which provide the department with resources (PASEO, SURGE). Faculty volunteer their time to advise and support science/biology related clubs such as BioForge and SETA. The Biology Department has facilitated several external relationships. There is a MOU (memorandum of Understanding) with Sequoia Riverlands Trust (SRT) which outlines a mutually beneficial arrangement: COS science classes use the Kaweah Oaks Preserve for educational purposes and SRT propagates native plants in the COS greenhouse. Additionally, COS students use the greenhouse for botany related activities which are coordinated with a SRT restoration specialist. A COS Biology faculty member volunteered as a speaker and guide for the Water Education Foundation's annual
What improvements are needed?: The Biology Department has consistently exceeded the State Goal for Efficiency (525) with a five year average of 585. In 2011-12 the Efficiency was 637. This was a result of more faculty members teaching larger classes in an attempt to meet the demand for these courses (128% Fill Rate in 2011-12). Biology instructors voluntarily have accepted the maximum number of students which can logistically and safely be taught with current laboratory space and equipment capacities. In order to meet district objectives of increased science course offerings the teaching and logistics capacity of the Biology Program must be increased. The number of students enrolled at Tulare and Hanford has increased steadily over the past three years but there is no specific laboratory technician budget at these campuses. In 2009-10 the Biology course distribution at Hanford Center was 4% and at the Tulare Center it was 0%; by 2013-14 the Biology course distribution was 14% at Hanford and 9% at Tulare. A dedicated laboratory technician is needed to meet the needs of these centers.

Additionally, the laboratory budget has yet to expand to meet the needs of increased course offerings over all three campuses. Thus the current laboratory technician and budget are both being stretched to cover Visalia biology labs as well as those at the Tulare and Hanford centers. This spreading of resources is at a maximum and the condition is less than ideal for the well being and success of the lab technician, the instructors and the students. In order to increase Biology course offerings both of these deficiencies will need to be addressed.

Describe any external opportunities or challenges.: Challenges facing the biology department include coordination and availability of necessary materials (models etc.) as well as consistency with level of difficulty as more of them are offered at off campus sites and by adjunct faculty. Along this same line, lab support for off campus sites is a challenge.

Additionally, faculty involved in these courses feel that they are challenged by the need to develop meaningful outcome assessments which lead to improvements.

Overall Outcome Achievement: The course outcomes for BIOL 1, BIOL 20 and BIOL 30 were assessed during this cycle (Fall 2013).

Three learning outcomes were assessed for BIOL 1. The outcomes included understanding of transcription, gene processing, and translation, mitosis and meiosis, as well as correlation between structure and function in classification of organisms. These outcomes were assessed via lab practicals, exams and homework assignments. The students satisfactorily met these learning outcomes. Two of the outcomes will be re-assessed in the subsequent cycle and one will be replaced with a new outcome.

Three learning outcomes were assessed for BIOL 20, Frontiers in Biology. The assessment consisted of exam questions, homework problems and laboratories which measured student understanding of Genetics via genotype and phenotype predictions, protein synthesis and the genetic code, as well as natural selection. The students satisfactorily met these learning outcomes. All three outcomes will be re-assessed during the subsequent cycle to incorporate results from new instructors as the course offerings are being expanded.

Two learning outcomes were assessed for BIOL 30, Human Anatomy. The students’ grasp of anatomical structures and functions as well as use of proper terminology were assessed via lecture quizzes and exams as well as laboratory practical exams. The students satisfactorily met these learning outcomes. These two outcomes will be assessed again in the subsequent cycle.

Changes based on outcome achievement: Biol 1 is changing the assessment strategy for one outcome and completely changing the second outcome. Biol 30 is changing the assessment strategy for both outcomes to improve consistency between instructors.

Outcome cycle evaluation: The Biology Program has established an outcome assessment cycle which divides the assessment for all courses over three years. The cycle is currently in the second year of implementation. The program is on schedule for the cycle as developed.

Action: Student access at Tulare and Hanford

Improve student access to Biology courses at Tulare and Hanford campuses.

Implementation Timeline: 2015 - 2016
Start Date: 08/03/2015
Completion Date: 05/27/2016
Status: New Action

Identify related course/program outcomes: General Ed Courses: Biol20, Biol21, Biol22

Person(s) Responsible (Name) Dean Robert Urtecho, Division Chair Jesse Wilcoxson
Rationale (With supporting data):
The Biology Department has consistently exceeded the State Goal for Efficiency (525) with a five year average of 585. The Fill Rates also increased over that time reflecting the faculty willingness to overfill their classes (128% Fill Rate in 2011-12). Additionally, offerings of Biology courses with laboratories have increased at the Tulare and Hanford centers. In 2009-10 the Biology course distribution at Hanford Center was 4% and at the Tulare Center it was 0%; by 2013-14 the Biology course distribution was 14% at Hanford and 9% at Tulare. To meet this demand the biology department needs to improve student access to Biology courses at Tulare and Hanford campuses.

Priority: High
Safety Issue: Yes
External Mandate: No

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<th>Resource Description</th>
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Add Resource Request for Action
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<td>Full time 10 month laboratory technician (To be shared with the Chemistry department)</td>
<td>Biology courses taught at Hanford and Tulare campuses require laboratories. These laboratories entail significant logistics including preparation of materials (solutions), setting up and take down of laboratory equipment and specimens, cleaning and maintenance of non-expendables (glassware), safe disposal of hazardous materials as per state mandated guidelines. Significant numbers of courses taught at these campuses are taught by adjunct faculty. These faculty members are not compensated for the time necessary to prepare, set up and take down labs. Existing laboratory technicians are primarily located on the Visalia campus and rarely are occasionally dispatched to Hanford or Tulare campuses. During those times they are unavailable to assist with the numerous labs offered at the Visalia campus. This arrangement is inadequate for current courses and minimizes the department’s ability to expand course offerings at Tulare and Hanford campuses. All Biology courses (with the exception of BIOL 25) include a laboratory component. Laboratory activities require set-up of materials, clean-up of materials, maintenance of equipment, proper storage of equipment and chemicals and proper disposal of hazardous materials. Currently, the majority of courses taught at Tulare and Hanford are taught by adjunct instructors. These instructors are not compensated for additional time requirements imposed by laboratory needs. These instructors are not trained to carry out the necessary maintenance.</td>
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**Resource Type:**
Classified- New/Replacement
Action: Expand Course Offerings

Hire full-time General Biology/Anatomy Instructor

**Implementation Timeline:** 2015 - 2016

**Status:** New Action

**Identify related course/program outcomes:**
- Allied Health Courses: Biol30, Biol31
- General Ed Courses: Biol20, Biol21, Biol22

**Person(s) Responsible (Name and Position):**
Dean Robert Urtecho, Division Chair Jesse Wilcoxson

**Rationale (With supporting data):**
Current full time faculty are attempting to meet continued requests by the administration for expanded course offerings by overfilling their courses. This is shown by the fact that teaching load is at 128%. Current faculty are teaching the maximum number of students possible and in order to increase course offerings to meet the demands of the administration as well as the needs of the students the Biology Department needs a new full-time faculty member.

**Priority:** High

**Safety Issue:** Yes

**External Mandate:** No