Comprehensive Program Review Report

Program Review - Biology

Program Summary

2020-2021

Prepared by: Heather Moore

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

Considering the last three years of data, the success rates for Biology Majors course BIOL 1 went from a 77% (2017-18), to 68% (2018-2019), and then 72% (2019-2020). The success rates for BIOL 2 ranged from a low of 73% (2017-18) to a high of 96% (2019-2020). The data continue to suggest that students who pass BIOL 1 are well prepared for BIOL 2. Dis-aggregated data indicates that success rates are better in nearly all ethnicity categories when compared to the entire department and when compared to the 6-year data for the District. Hispanic success rates in BIOL 1 ranged from 65-75% while White success rates ranged from 70-80%. BIOL 2 dis-aggregated data shows that success rates ranged from 72-100% for Hispanics and from 67-82% for Whites. This suggests an improvement this academic year compared to the last.

BIOL 1 FTES increased from 33.0 FTES in 2017-18, to 35.10 in 2018-19, and then dropped to 34 in 2019-2020. BIOL 2 saw an increase in FTES from 2018-19 (14.1) to 16.5 in 2019-2020. The recent increases have been sustained over a three-year period, compared to 2015-16 when FTES was 8.4. These courses both have 3 hours of lecture and 6 hours of lab per week. These courses represent a significant proportion of the workload of the faculty that teach them (84% of a full-time load). This large load necessitates a reduction in the other courses that these instructors teach. As a result, we continue to see a reduction in some of the general education course sections (BIOL 21 and BIOL 22) and BIOL 40 when those instructors teach the majors.

(2) General Education Courses

BIOL 20 (Frontiers in Biology) success rates have remained steady across the last three years; 79% in 2017-18, 77% in 2018-19, and 81% in 2019-2020 . The dis-aggregated data for BIOL 20 indicate that the success rates were higher in BIOL 20 than for the entire Biology Department that for all ethnicities. There were no differences in success rates between genders in BIOL 20. BIOL 20 has increased FTES from 117.6 (2017-18) to 149.2 (2019-2020).

BIOL 21 (Plant Biology) has increased success rates over the past three years from 61% (2017-18), 62% (2018-19) to 81% (2019-2020). The gap between Whites and Hispanics success has decreased whereby the Hispanic success was 82% and White was 87% in 2019-2020; previously there was a 14% gap. Biology 21 FTES increased from 15.5 in 2017-18 to 17.5 in 2018-2019, and has remained fairly steady at 17.3 in 2019-2020.

BIOL 22 (Animal Biology) success rates increased from 71% (2017-18) to 82% (2018-19), then dropped slightly to 79% (2019-2020). The dis-aggregated success data for BIOL 22 showed that success rates for Hispanics were 5% higher than that for Whites for the 2018-2020 period. The success rates for Hispanics went from 74% (2017-18) to 85% (2018-19), to a 77% (2019-2020). The success rates for both Hispanics and Whites were higher in BIOL 22 than in the entire Biology department for two of the three years. BIOL 22 FTES has increased from 11.7 in 2017-18 to 16.0 in 2018-19 to 20.3 in 2019-2020.

BIOL 25 (Human Ecology) success ranged from 78% in 2017-18, to 81% in 2018-19, to 79% in 2019-2020. In the past two years the dis-aggregated data shows that the Hispanics and Whites had and equal success rate of 84% in BIOL 25; however, a gap of 17% was detected in the 2019-2020 data, whereby Hispanic success fell to 76%, and White success was 93%. There has been an increase in FTES in BIOL 25 from 8.3 in 2017-18 to 8.8 in 2018-19, to 9.1 in 2019-2020.

(3) Allied Health Courses

Over the past three years we have experienced turnover in faculty who teach Biology 30, 31 and 40. We have lost full-time tenured faculty and anticipate the retirement of another after this academic year. We have had to rely on full-time temporary faculty to teach these courses, over two successive academic years. Additionally, we have lost several adjunct instructors. At the same time, the administration has been pushing the department to add more sections to serve the student demand for these courses. The department as a whole, and these courses in particular, have accommodated this demand by adding a significant numbers of sections and accepting additional students into many of the sections. Our FTES in BIOL 30 has decreased from 145.0 in 2017-18 to 135.8 in 2018-19 and 132 in 2019-2020 , but we feel this is still an overall increase, considering the FTES in 2015-16 was 116.2. The FTES for BIOL 31 has remained steady for the past three years, 73.2 in 2017-18, 74 in 2018-19, and 73.2 in 2019-2020, but shows growth considering in 2016-17 FTES was 66.2. Please note, the increase in BIOL 31 comes with no additional faculty teaching these courses, and results from each of the instructors accepting additional students into their classes. Biology 40 FTES has decreased from to 75.2 in 2017-18, to 65.7 (2018-19), to 63.6 in 2019-2020 . This fluctuation is due to faculty turnover and an instructor rotating into BIOL 1.

The success rate for BIOL 030 (Human Anatomy) improved from 54% in 2017-18 and 55% in 2018-2019 to 62% in 2019-2020. Success in this course is below the overall success rate at COS (70%) and is the lowest of the Biology courses. It is also lower than the statewide success rate for anatomy and physiology (64.6%). Dis-aggregating success rate by race/ethnicity shows that success rates are lower in all groups when compared to the same groups in all Biology courses. The previous gap in success rates between Hispanics (51%) and Whites (62%) in 2019-2019 was lessened to 5% in 2019-2020 ((61% and 65%, respectively). There are no differences in success rates by gender.

There are no prerequisites for BIOL 30 and this course is a prerequisite to enroll in BIOL 31, Human Physiology. Therefore, any student with any of a huge array of backgrounds can enroll. Not all incoming students to BIOL 30 are truly committed to the rigors of becoming a health care professional. This is not necessarily because of poor instruction or quality of students, but may simply be that the students are not prepared for the rigors of a fast-paced science course which assumes that students know how to effectively absorb highly technical and detailed information and incorporate it into a larger framework. Their unsuccessful outcomes are not, fully, an issue that instruction can solve. We must maintain continuous improvement by attempting to understand better the reasons why students drop BIOL 30 and the causes of remaining students receiving non-passing grades, and correct those over which we have control. It should be noted that the students who do succeed in completing the allied health prerequisite courses (BIOL 30, 31, and 40) are finding success in the Nursing Program and the Physical Therapy Assistant Program. Additionally, the relatively high success rates we have in BIOL 31 and BIOL 40 may be facilitated by the grade outcomes of BIOL 30. Students who perform well in BIOL 30 have practiced valuable study techniques and time management skills, and are prone to dedicate more time to studying effectively when enrolled in the more difficult BIOL 31 and BIOL 40 courses.

It may be that there exist variations in the content and rigor of the courses taught by the numerous faculty teaching BIOL 30. Physiology instructors have noted students entering their classes have different levels of preparation after completing the same course. Some of them lack the necessary anatomy vocabulary and basic concepts required for understanding physiology. The lack of cohesiveness across anatomy sections is being addressed. The full-time faculty are in the process of establishing minimum content/rigor guidelines that will be subsequently shared between them and with adjunct instructors in an effort to normalize these variables across the District. During this process, we can explore ways to increase success rates.

Biology 31, Human Physiology, is one of the prerequisites for allied health programs. The success rates for BIOL 31 for the last three academic years have been 78% (2017-18), 77% (2018-19), and 83% (2019-2020). All three exceed the success rates of the department, as a whole. The gap between the Hispanic and White student success has persisted throughout the last three year period. The success rate remains steady for Hispanics over the last three years, 76% (2017-18), 73% (2018-19) to 79% (2019-2020), but the White success rate rose from a low of 83% (2018-2019) to 95% in 2019-2020. Physiology requires a lot of written work that demonstrates critical thinking, both on laboratory reports and lecture exams. Instructors have noticed that students, of all ethnic groups, but especially the Hispanic and Hmong students, have struggled to find the confidence to put what they have learned into well written passages. We have encouraged students to use the writing center and tutors to help with their scientific writings.

Biology 40, Microbiology, is one of the three core prerequisites for allied health majors. The success rates for BIOL 40 increased from 72% (2017-18) to 77% (2019-2020). The dis-aggregated success data for BIOL 40 show a slight gap in success rate between Hispanics and White (74% compared to 78% respectively in 2018-19) but this gap widened in 2019-2020 to 10%, 75% and 85% respectively.

Workload:

The Biology Department's productivity increased from 19.22 in 2017-18 to 19.5 in 2018-19 to 19.88 in 2019-2020; the departmental FTES has increased from 495 to 515 over the past three years. The allied health courses have the highest productivity in the department. BIOL 31 has 23.5, BIOL 30 has 22.6, and BIOL 40 has 18.0. These courses also provide the majority of the FTES for the department, 269 FTES. Success in the division increased over the past three year period from 69.3% (2017-2018), to 70.3% (2018-2019), and to 75.8% in 2019-2020.

There has been a significant increase in the number of sections of Majors biology courses offered. In 2019-2020, BIOL 1 and BIOL 2 accounted for 50.4 FTES. This was an increase from the previous year at 49.1. These courses have a significant number of contact hours per week (3 hours of lecture and 6 hours of lab). In order to maintain our productivity, these courses are taught with a single lecture and a double lab. Therefore, the instructor for these courses teach 3 hours of lecture and 12 hours of lab per week for the major courses. This greatly affects the load of the faculty that teach these courses; it affects the lab room utilization, and it affects the lab preparation requirements. We feel the demand for the major courses is solid because we are turning away students trying to add BIOL1. We are under-serving this population because we are pulling instructors from the majors to cover Bio 40 and the non-major courses.

The FTES of BIOL 20, 21, and 22 has consistently increased over the last three year period. BIOL 20 FTES accounts for the largest portion of Biology FTES at 149.2. The increase in BIOL 20 is primarily due to additional adjunct faculty being hired.

The high demand for the Biology classes is continuing. We have experienced an increase of 20.1FTES over the past three years. Data taken during this time period demonstrates that the department has a Fill-Rate consistently over 100%. This indicates that even while we are increasing the number of courses offered, faculty are continuing to accept additional students into their classes above the cap. Since we are increasing course offerings and filling class sections beyond the cap, this demonstrates a continuing unmet demand for biology courses.

Internal and External Relationships:

The Biology Department interacts with internal support services including the MESA program, and the Student Success Center on the Hanford campus, which provides tutors, models, workshops, microscope slides and study areas for Biology students. The department also benefits from grants which provide the department with resources , including funding for our supplemental instruction leaders (SI). Faculty volunteer their time to mentor and supervise the SI leaders and tutors supporting their discipline. Faculty volunteer their time to advise and support science/biology related clubs such as SETA and the Alliance of Biological and Chemical Sciences (ABCS). In 2019-20, members of the biology and chemistry departments formed a new student-run club called the Alliance of Biological and Chemical Sciences (ABCS). This club, which helps students realize the intimate connection between biology and chemistry, expands on COS' course offerings through a mixture of activities including educational talks by COS faculty, special guest speaker talks, hands-on laboratory experiments, community service activities, and social activities.

The Biology Department has facilitated several external relationships. COS science classes use the Kaweah Oaks Preserve for educational purposes. Additionally, COS students use the greenhouse for botany related activities which are coordinated with Sequoia Riverlands Trust (SRT) related field trips. A COS Biology faculty member volunteered as a speaker and guide for the Water Education Foundation's annual spring tour. Faculty members also volunteered as speakers and workshop demonstrators for Expanding Your Horizons, a program to promote and introduce STEM fields to young female students from area middle schools. The Biology department participates in the REALM Grant. The REALM (Resources for Engagement and Active Learning through Mentorship) Grant, a federally-funded STEM support program helps new STEM students by providing: extended summer orientations; academic coaching, tutoring; specialized counseling, textbook loans, and university visits. In addition, the grant provides funding for faculty for equipment purchases and professional development at conferences such as American Association for the Advancement of Sciences, National Association of Biology teachers, and Online Learning Consortium.

What improvements are needed?: The Biology Department must be able to grow our course offerings while maintaining the consistency and rigor of the curriculum. The coordination of offerings, along with coordination of course materials at the different campuses, needs to be a priority.

Beginning in the Fall of 2018, the science division has had the equivalent of two full-time faculty members on our Hanford campus. We are currently offering all three nursing/allied health prerequisites on this campus, in addition to providing other science offerings for the general education pattern. FTES has increased from 96.2 (2017-18) to 107 (2019-2020). Overall the growth in FTES and total offerings is beneficial, but it has also introduced some unforeseen growing pains. We have inadequate lab space and storage, and are lacking some basic laboratory equipment. In Tulare our FTES has grown significantly over the past three years from 48 (2017-18), to 61.6 (2018-19), to 74.67 (2019-2020). We are currently offering two of the = three nursing/allied health prerequisites on this campus, in addition to providing other science offerings for the general education pattern.

The laboratory space is very limited on the Hanford campus because all laboratory courses for all divisions of the College share the same classroom which prevents these courses from overlapping on the schedule. This includes courses that would draw very different students and not create student course conflicts. On the Visalia and Tulare campuses, Biology 20, the non-major general education science, and the nursing/allied-health science classes can be taught at the same time. In Biology, we assess our students using applied laboratory exams (identification of microscopic/macroscopic samples, gross anatomical structures, etc). Since these exams require microscopes, models, and/or specimens, they require a significant amount of time to set up and clean up between classes. This creates scheduling conflicts and prevents back-to-back course offerings, and ultimately decreases efficiency and greatly limits which courses can be offered and the times we can offer them. In the future, the lack of available laboratory space would prevent science, and other divisions who utilize the laboratory classroom, from offering additional sections during normal business hours. At Hanford faculty orientation in 2018 there was conversation suggesting additional classrooms would be built on the Hanford campus. It is our division's hope that additional laboratory space will be provided and that our division membership can be part of the planning to ensure that the space is properly equipped.

In order for the Biology Department to offer sufficient general biology sections, we hired two full-time positions in the Spring of 2020; a biology majors/microbiology position in Visalia and a microbiology/general biology position in Hanford. This year we will be filling a full-time anatomy and physiology position following the retirement of one of our colleagues. We are currently utilizing a one-year temporary instructor for our Bio 30 and Bio 31 courses.

In order for the Biology Department to offer valuable student learning experiences in laboratory, we are requesting an increase in our supply budget.
Our FTES have steadily increased over the past three academic years which is a positive, but this growth comes at a cost. Last year the division divided the supply budget so that the student needs could be best met on all three of our campuses. The budget allocation for Hanford and Tulare seems to be working much better than the past, but the allocations should be evaluated annually to address specific needs of the campuses. For example, Hanford experienced significant growth in biology FTES from 2015-2018, but has remained fairly constant from 2018-2020. Biology FTES has significantly increased over the past three years, so additional lab budget may need to be dedicated to support the Tulare students' lab costs.
Describe any external opportunities or challenges.: The most significant external challenge to our division has been COVID-19. In March of 2020, the pandemic caused our on-campus activities to immediately cease and we quickly moved all of our courses online. This caused faculty to dramatically alter their pedagogy, especially regarding the delivery of inquiry-based labs. We moved our lectures to video-conferencing platforms, all assessments to Canvas, and adopted simulated laboratory experiences, app-based learning tools, and did our best to provide valuable online learning experiences for our students. Online-only and hybrid options for courses will remain our "new normal" in Biology through the academic year 2020-2021. We are adapting but the honest evaluation of what and how we are doing remains very much an unknown. The 2019-2020 success data may be slightly skewed by moving courses online, but since the Fall 2019 semester was in-person we can't concretely analyze the impact. Program review completed next year may give us a better picture of student success and retention in Biology, when the courses are taught online or in a hybrid format.

We can however reflect on the rate of Excused Withdrawals during Spring 2020 as a consequence of the unforeseen transition to online instruction coupled with complications in students' lives as they were impacted by COVID-19. The District provided 4,573 excused grades, this accounted for 12.4% of the census enrollment of 36,874. When we look at the EW by ethnicity, African-American (16.9%) and Hispanic (13%) students where more likely than the other ethnic groups to withdrawal from their courses. The rate for White students was 10.1%. The withdrawal rates for Biology was 12.2% which is similar to the District, but when we look at individual courses, some of our courses are outliers. The withdrawal rates of Bio 2 (5.5%) and Bio 21 (4%) were the least. The withdrawal rates for Bio 22 (20.3%) and Bio 30 (14.8%) were the highest. For all of our courses the withdrawal rate for our Hispanic students was higher than White students, but was numerically similar to that of the District (approximately 2-

3%). All of the Biology courses lacked enough African-American students to be analyzed by our District's research division. Can the higher withdrawals be attributed to lack of access to technology or reliable internet, learning/teaching styles that struggle online, or extrinsic factors? Unfortunately we may never know but the EW trends will continue for the next academic year and should be addressed.

Overall SLO Achievement: Biology 001 assessed 3 SLO's during the 2019-2020 year. The students met the expected competency level in each.

SLO assessments for Bio 20 and Bio 30 was disrupted by COVID. Our assessment plan was based on practical laboratory exams that could not occur due to campus closures so we were forced to postpone the assessments until Fall of 2020. The faculty teaching Bio 30 convened in early September and decided on SLO that could be assessed online, those assessments are occurring Fall semester 2020.
Changes Based on SLO Achievement: No changes are recommended. Our immediate work will focus on developing assessments that can be completed in online and hybrid formats for the 2020-2021 academic year.
Overall PLO Achievement: This year, we were tasked with assessing the PLO's for the Associate of Science in Biology for Transfer (AS-T) program. To accomplish this a committee has been formed, made up of the Biology Major's instructors, to review outcomes, create assessment plans, and interpret the assessment results for this program. During the latest committee meeting, an assessment plan was created for the 2021-2022 school year. It was determined that an assessment during the current school year (2020-2021) could not be accomplished due to the lack of face to face labs required to accurately assess the program outcomes.
Changes Based on PLO Achievement: Biology is on-track with our SLO assessment cycle and our PLO is progressing. We have no plans to change the cycle at this time
Outcome cycle evaluation: The three-year evaluation cycle for the Biology Department appears to be effective. No changes to the cycle are being contemplated.

Action: 2020-2021 Maintain current enrollment in anatomy and physiology

Hire a tenure-track anatomy and physiology faculty member

Leave Blank:
Implementation Timeline: 2020 - 2021
Leave Blank:
Leave Blank:
Identify related course/program outcomes: SLO Bio 30 and Bio 31
Person(s) Responsible (Name and Position): Heather Moore
Rationale (With supporting data): Last Spring our senior anatomy and physiology instructor retired. She typically taught a double Human Physiology course and a double, or often a triple, anatomy course. When she announced retirement we were granted a one-year temporary position to cover her teaching load. This position will end in May of 2021. We need to replace this position in order to meet the student demand for these courses.

Bio 30 and Bio 31 have some of the highest FTES in Biology, 149.2 and 72.2, respectively for 2019-2020, and they also have the highest FTES/FTEF ratios at 22.6 for Bio 30 and 23.46 for Bio 31 (data from 2019-2020). The high demand exists because both courses are prerequisites for our most prevalent major, nursing. The courses are critical to the success of the nursing program and the Biology division.

Current full-time and adjunct faculty are attempting to meet continued requests by the administration for expanded course offerings by overfilling their courses. Current faculty are teaching the maximum number of students possible and in order to increase course offerings to meet the demands of the administration and students.
Priority: High
Safety Issue: No
External Mandate: No
Safety/Mandate Explanation:

Resources Description

Program Review - Biology

Personnel - Faculty - Biology - Anatomy and Physiology faculty replacement position (Active)
Why is this resource required for this action?: Anatomy and Physiology courses have the highest demand within the Science Division, with enrollment "bottlenecks" that hold students from progressing through their educational pathways.
Notes (optional):
Cost of Request (Nothing will be funded over the amount listed.): 100000

Link Actions to District Objectives

District Objectives: 2018-2021
District Objective 1.1 - The District will increase FTES by 1.75% over the three years
District Objective 2.1 - Increase the percentage of students who earn an associate degree or certificate (CTE and Non-CTE) by 5 percentage points over three years

Action: 2020-21 Provide student access to environmental laboratory experiences which utilize our greenhouse and native garden

Hire a part-time technician to maintain the green house and native garden.

Leave Blank:
Implementation Timeline: 2020 - 2021
Leave Blank:
Leave Blank:
Identify related course/program outcomes: Students should be afforded hands-on experiences with a variety of native and exotic plant species. Numerous courses (Biology 2, 20, 21, 25) utilize this facility.
Person(s) Responsible (Name and Position): Brad Goodbar
Rationale (With supporting data): Specimen from the greenhouse and native garden are required for Bio 02, 20, 21. The maintenance of the greenhouse and garden was provided in past years by volunteers, consisting of faculty and students. Although the philanthropic gesture of these individuals' time is greatly appreciated, the condition of the greenhouse and garden has deteriorated. We have lost specimen because volunteers mistook the plants as unwanted and they were disposed of, only later to be needed in a laboratory.
Over the past three years Bio 20 has grown in FTES at a greater rate than any other biology offering. It grew from 117.6 in 2017-18 to 149.2 in 2019-2020. The demand for this class is persisting on all 3 campuses. Bio 2 and 21 has also increased in FTES over the same time period.
We also feel exposure to nature is critical for our student experience in biology courses. The student experience becomes more meaningful and memorable when learning is hands-on. When students can observe nature first hand, their level of engagement and intrigue increases which improves student success. In recent years there have been several publications citing the lack of access to outdoor opportunities for minorities. This trend has been coined, "access to nature inequality" and even "the nature gap". Many of our students have lived in Tulare County their entire lives yet never visited Sequoia National Park or Yosemite. Through field trips and laboratory experiences that utilize natural resources like our green house and native garden we are providing those opportunities which will help close the access to nature gap.

Priority: High
Safety Issue: No
External Mandate: No
Safety/Mandate Explanation:

Resources Description

Personnel - Classified/Confidential - Part-time technician to assist with the adequate upkeep of the greenhouse and native garden. (Active)
Why is this resource required for this action?: The greenhouse and native garden are used for educational observations in BIOL 021 and BIOL 025
Notes (optional):
Cost of Request (Nothing will be funded over the amount listed.): 15000

Program Review - Biology

Link Actions to District Objectives

District Objectives: 2018-2021
District Objective 1.1 - The District will increase FTES by 1.75% over the three years
District Objective 2.1 - Increase the percentage of students who earn an associate degree or certificate (CTE and Non-CTE) by 5 percentage points over three years
District Objective 2.2 - Increase the number of students who transfer to a four-year institution by 10 percent over three years

Action: 2020-2021; Increase student access to Majors Biology and General Education Biology courses

Hire a tenure-track faculty replacement position and a tenure-track faculty growth position to teach BIOL 1 and/or BIOL 2, and the general education biology courses including BIOL 20 and BIOL 21.

Leave Blank:

Implementation Timeline: 2020 - 2021

Leave Blank:

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Identify related course/program outcomes: Student learning outcomes for BIOL 1 and/or BIOL2, and the general education biology courses (BIOL 20, BIOL 21 and BIOL 25)

Person(s) Responsible (Name and Position): Brad Goodbar, Heather Moore

Rationale (With supporting data): In order to adequately cover both major and general education classes, we are requesting two tenure-track position for the Visalia campus. One position would be a replacement position due to a retirement that will take place at the end of this academic year, the other is a growth position. These positions would allow us to cover the Majors biology courses and better serve the students in general education and the Microbiology courses.

The FTES in the Majors biology courses and general education biology courses has increased over the past three years, but we are having difficulty meeting student enrollment demands due to a faculty shortage. The BIOL 1 FTES increased was brought about by offering double sections of BIOL 1 in both Fall and Spring semesters. BIOL 2 saw an increase in FTES from 13.8 in 2016-17 to 16.5 in 2019-2020. The recent increases have been sustained over a five-year period, compared to 2015-16 when FTES was 8.4. These courses both have 3 hours of lecture and 6 hours of lab per week. These courses represent a significant proportion of the workload of the faculty that teach them (84% of a full-time load). This large load necessitates a reduction in the other courses that these instructors teach. As a result, we are seeing a reduction in some of the general education course sections (BIOL 21 and BIOL 22) and BIOL 40 when those instructors teach the majors. Since the same instructors teach BIOL 1 or BIOL 2 and general education biology courses, we are rotating their schedules every other semester which creates shortages in course availability.

Priority: High

Safety Issue: No

External Mandate: No

Safety/Mandate Explanation:

Resources Description

Personnel - Faculty - One replacement position and one growth position for two Biology, Anatomy & Physiology and General Biology & Ecology (Active)

Why is this resource required for this action?: The one replacement and one growth positions are needed in order to sustain course offerings in high-demand courses.

Notes (optional):

Cost of Request (Nothing will be funded over the amount listed.): 200000

Link Actions to District Objectives

District Objectives: 2018-2021

District Objective 1.1 - The District will increase FTES by 1.75% over the three years
District Objective 2.1 - Increase the percentage of students who earn an associate degree or certificate (CTE and Non-CTE) by 5 percentage points over three years
District Objective 2.2 - Increase the number of students who transfer to a four-year institution by 10 percent over three years

Action: 2020-2021; Expand course offering on the Tulare campus

Acquisition of equipment necessary to offer Bio 31 for the Tulare campus.

Leave Blank:
Implementation Timeline: 2020 - 2021
Leave Blank:
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Identify related course/program outcomes: SLO for Bio 31
Person(s) Responsible (Name and Position): Heather Moore
Rationale (With supporting data): The most commonly declared major in the District is Nursing. Human Physiology and Microbiology are prerequisites for the nursing program, but neither are offered on the Tulare campus. In order to meet demand and service the needs of the nursing students in Tulare it has been recommended by Tulare administration and faculty that we expand course offerings to include Human Physiology, BIOL 31.
Since we intend for the student experience in Bio 31 to be equitable across all three campuses, the equipment costs to set up BIOL 31 are initially significant. This would include the purchase of eight iWorx units and laptops to interface with the units. Additionally we would need to purchase the reagents and consumables used for labs that don't utilize the iWorx units. The iWorx units are currently priced around $5,000 per unit. Once purchased though the costs associated with iWorx maintenance are manageable and similar to the costs associated with other biology courses already taught in Tulare.
Last year we were awarded two iWorx units through Foundation for our Hanford campus. We will actively seek above-base budget, Tulare Center, and Foundation funding to help fund this growth.
Priority: Medium
Safety Issue: No
External Mandate: No
Safety/Mandate Explanation:

Resources Description

Equipment - Instructional - Instructional equipment needed to expand course offering of BIOL 031 at the Tulare Campus (Active)
Why is this resource required for this action?: BIOL 031 fill rates are amongst the fastest within the Division. The scarcity of the facilities at the Visalia Campus limits the number of sections that can be scheduled, therefore Tulare is a viable alternative and will serve the Tulare student population.
Notes (optional):
Cost of Request (Nothing will be funded over the amount listed.): 60000

Link Actions to District Objectives

District Objectives: 2018-2021
District Objective 1.1 - The District will increase FTES by 1.75% over the three years

Action: 2019-2020 Increase Access to Majors Biology and General Education Biology Courses

Hire a tenure-track growth position faculty member to teach BIOL 1 and/or BIOL 2, and the general education biology courses including BIOL 20 and BIOL 21 on the Visalia campus.

Leave Blank:
Implementation Timeline: 2019 - 2020
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Program Review - Biology

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Identify related course/program outcomes: Student learning outcomes for BIOL 1 and/or BIOL2, and the general education biology courses (BIOL 20 and/or BIOL 21)
Person(s) Responsible (Name and Position): Thea Trimble, Division chair
Rationale (With supporting data): In order to adequately cover both major and general education classes, we are requesting an additional tenure-track position for the Visalia campus. This position would allow us to cover the Majors biology courses and better serve the students in general education and the Microbiology courses.

The FTES in the Majors biology courses and general education biology courses has increased over the past three years, but we are having difficulty meeting student enrollment demands due to a faculty shortage. The BIOL 1 FTES increased from 33.0 FTES in 2017-18 to 35.10 in 2018-19. This represents a 6.4% increase. This increase was brought about by offering double sections of BIOL 1 in both Fall and Spring semesters. BIOL 2 saw an increase in FTES from 13.8 in 2016-17 to 15.6 in 2017-18; in 2018-19 FTES was 14.1. The recent increases have been sustained over a three-year period, compared to 2015-16 when FTES was 8.4. These courses both have 3 hours of lecture and 6 hours of lab per week. These courses represent a significant proportion of the workload of the faculty that teach them (84% of a fulltime load). This large load necessitates a reduction in the other courses that these instructors teach. As a result, we are seeing a reduction in some of the general education course sections (BIOL 21 and BIOL 22) and BIOL 40 when those instructors teach the majors. Since the same instructors teach BIOL 1 or BIOL 2 and general education biology courses, we are rotating their schedules every other semester which creates shortages in course availability.
Priority: High
Safety Issue: No
External Mandate: No
Safety/Mandate Explanation:

Update on Action

Updates

Update Year: 2020 - 2021 08/22/2020
Status: Action Completed
Vineet Patel was hiring in the Spring of 2019.
Impact on District Objectives/Unit Outcomes (Not Required):

Resources Description

Personnel - Faculty - Tenure-track faculty salary to cover instructor teaching Major Biology courses and General Education courses (Active)
Why is this resource required for this action?: We are offering more sections of the Major Biology courses and do not have the faculty to cover these classes and the General Educational courses to support the student enrollment demand.
Notes (optional):
Cost of Request (Nothing will be funded over the amount listed.): 160000
Related Documents:
BIOL 1 FTES 2019.pdf
BIOL 2 FTES 2019.pdf
BIOL 20 FTES Campus - 2019.pdf

Link Actions to District Objectives

District Objectives: 2018-2021
District Objective 1.1 - The District will increase FTES by 1.75% over the three years
District Objective 2.1 - Increase the percentage of students who earn an associate degree or certificate (CTE and Non-CTE) by 5 percentage points over three years
District Objective 2.2 - Increase the number of students who transfer to a four-year institution by 10 percent over three years

Program Review - Biology

Action: 2019-2020; Increase supply budget to achieve equity for students enrolled in laboratory courses taught on the Tulare, Hanford, and Visalia campuses.

Augment the base budget for laboratory supplies to support the increased course offerings and larger enrollment of students in our laboratory courses on the Tulare, Hanford, and Visalia campuses.

Leave Blank:

Implementation Timeline: 2019 - 2020

Leave Blank:

Leave Blank:

Identify related course/program outcomes: This item would link to the Course Outcomes of all Biology courses taught on our three campuses. This would include: BIOL 1, BIOL 2, BIOL 20, BIOL 21, BIOL 25, BIOL 30, BIOL 31, and BIOL 40.

Person(s) Responsible (Name and Position): Heather Moore

Rationale (With supporting data): The demands for our supply resources have significantly grown as we have become a multi-center district. The course offerings have been expanded and instructors are accepting more students in each section. Our FTES has increased over the past three academic years, particularly on our Tulare and Hanford campuses. The FTES for the Visalia campus grew from 325.67 (2016-17) to 336.39 (2018-2019), Tulare grew from 48.80 (2016-17) to 61.60 (2018-19), and Hanford grew from 77.97 (2016-2017) to 105.40 (2018-19). Our combined FTES rose from 452.43 (2016-17) to 503.39 (2018-19). This growth is obviously a positive but is expensive considering each student participates in laboratory activities that either require consumables or technical equipment.

As we add new course offerings on the Tulare and Hanford campus, we are required to spend money to get those campuses outfitted like the Visalia campus. We need to take these actions to ensure equitable student experiences across our campuses. In the past, the offerings in Tulare and Hanford were fewer and we could borrow and transport equipment from Visalia to Tulare/Hanford; but, this is no longer feasible as we have grown. There are too many conflicts for equipment between all locations that teach the same course at similar times. Last year we were provided with a one-time augmentation of $8000, but this amount was inadequate, and we overspent that amount by approximately $3000 in order to expand our Chemistry offerings on the Tulare campus. Currently in Hanford, our BIOL 20 and BIOL 40 instructors are modifying lab curriculum because we are lacking equipment and lab supplies. This inequity in laboratory equipment and supplies on the Tulare/Hanford campus when compared to the Visalia campus ultimately puts the Tulare/Hanford students at a disadvantage.

In addition to the expenses required to outfit our Hanford/Tulare centers, the cost of consumables for the laboratory activities on all campuses have increased due to price increases or inflation, combined with our division requiring more supplies to support the additional students enrolled.

Priority: High

Safety Issue: No

External Mandate: No

Safety/Mandate Explanation:

Update on Action

Updates

Update Year: 2020 - 2021 08/22/2020

Status: Action Completed

Budget was allocated for Hanford and Tulare based on course offerings, student enrollment, and associated costs for different offerings. Separate budgets are being managed and maintained by the lab technicians at the centers.

Impact on District Objectives/Unit Outcomes (Not Required):

Resources Description

Adjustment to Base Budget - Increase the laboratory supply budget for Biology. (Active)

Why is this resource required for this action?: The goal of the division is to provide equitable laboratory experiences for all of our students. We are currently serving more students on all three campuses, and laboratory supplies have become

more expensive; thus, we require an increase in supply monies to cover these increasing costs.
Notes (optional):
Cost of Request (Nothing will be funded over the amount listed.): 3000
Related Documents:
2019 FTES by Campus.pdf

Link Actions to District Objectives

District Objectives: 2018-2021
District Objective 1.1 - The District will increase FTES by 1.75% over the three years
District Objective 2.1 - Increase the percentage of students who earn an associate degree or certificate (CTE and Non-CTE) by 5 percentage points over three years

Action: 2019-2020; Properly equip the prep room on the Hanford campus to better support the BIOL 20 and BIOL 40 courses.

Properly outfit the prep room on the Hanford campus to supply the needed resources for the BIOL 20 and BIOL 40 courses so that students at this campus receive equitable laboratory experiences (compared to students enrolled at our other Centers).

Leave Blank:
Implementation Timeline: 2019 - 2020
Leave Blank:
Leave Blank:
Identify related course/program outcomes: BIOL 20 and BIOL 40 Student Learning Outcomes
Person(s) Responsible (Name and Position): Heather Moore
Rationale (With supporting data):
Priority: High
Safety Issue: No
External Mandate: No
Safety/Mandate Explanation:

Update on Action

Updates

Update Year: 2020 - 2021 08/22/2020
Status: Action Completed
Above base budget funding was provided for this project. The current Bio 20/Bio 40 instructor worked with the lab technician to order needed supplies for these labs.
Impact on District Objectives/Unit Outcomes (Not Required):

Resources Description

Equipment - Instructional - Obtain necessary start-up equipment to properly outfit the Hanford prep room to provide adequate supplies for our BIOL 20 and BIOL 40 courses. (Active)
Why is this resource required for this action?: The inventory of equipment and consumables required for BIOL 40 and BIOL 20 is very limited on our Hanford campus. We are currently borrowing and returning inexpensive equipment from Visalia for the BIOL 20 laboratories. The logistics of borrowing and returning has become complicated since this task doesn't fall into any person's job description, and has resulted in time conflicts for the same materials between courses on the Visalia campus and Hanford campus. We are lacking basic staining materials, and have been unable to prepare some of the needed reagents for the BIOL 40 course because we are lacking proper glassware.
Ideally we should offer the same opportunities for our students and be able to maintain the rigor associated with all of courses regardless of the location where the laboratory courses are offered. In order to offer equatable student experiences in the laboratory sections, we require some start-up funding in Hanford to better equip our prep room so that

it can better mirror the resources available at our other Centers.
Notes (optional):
Cost of Request (Nothing will be funded over the amount listed.): 1500

Link Actions to District Objectives

District Objectives: 2018-2021

District Objective 1.1 - The District will increase FTES by 1.75% over the three years

Action: 2019-2020; Provide equitable access to iWorx data acquisition and analysis units for Bio 31 students across our campuses

Obtain additional iWorx data acquisition and analysis units in Hanford to ensure all Bio 31 students have equitable access to technology while in the laboratory classroom.

Leave Blank:
Implementation Timeline: 2019 - 2020
Leave Blank:
Leave Blank:
Identify related course/program outcomes: BIOL 31 student learning outcomes
Person(s) Responsible (Name and Position): Heather Moore
Rationale (With supporting data): In 2017-18 our physiology faculty adopted the iWorx data acquisition and analysis units for our labs in Visalia and Hanford. All physiology instructors are currently employing this technology in several of their lab periods. In Visalia there are 24 student seats in the laboratory classroom and in Hanford there are 30 student seats. All physiology instructors are accepting additional students into their lab sections to serve the demand of students trying to add the course. In Hanford, we are serving on average 36 students in each laboratory section, but are operating our labs with the same number of iWorx units as Visalia (which was based on 24 students per lab). This limits student access because the Hanford students are required to wait longer for their turn, and it forces us to include more students in an experimental group. This practice in Hanford isn't time efficient and reduces each student's interaction with the technology when compared to the student experience in Visalia.
Over the last three academic years, BIOL 31 has had the highest FTES (29.2 in 2018-19) of our Hanford science offerings (despite it not be offered in the summer). The demand for the course is not waning and this enrollment level can be maintained by our current instructor. The productivity measurement for BIOL 31 taught in Hanford across the past three academic years is 27.88 (2016-17), 26.54 (2017-18), and 28.08 (2018-19) compared to BIOL 31 taught in Visalia which was 19.38, 21.92, and 21.54, respectively. This data demonstrates the consistent larger class size on our Hanford campus.
Priority: High
Safety Issue: No
External Mandate: No
Safety/Mandate Explanation:

Update on Action

Updates

Update Year: 2020 - 2021 08/22/2020
Status: Action Completed
Funding for this was awarded through Foundation. Heather Moore wrote the proposal.
Impact on District Objectives/Unit Outcomes (Not Required):

Resources Description

Equipment - Instructional - Purchase two additional iWorx data acquisition and analysis units for our Hanford campus. (Active)
Why is this resource required for this action?: A goal of the biology division is to provide equitable laboratory experiences for our students across all of our Centers. The BIOL 31 instructors on the Visalia and Hanford campuses utilize the iWorx

data acquistion and anaylsis units as our primary teaching technology for lab. We have the same number of units on both campuses but we serve more BIOL 31 students per laboratory section in Hanford compared to our Visalia location. The Hanford science lab used for BIOL 31 seats more students than our Visalia location; our average student enrollment in a BIOL 31 laboratory in Hanford is approximately 36 students. When this equipment was purchased a few years ago it was based on Visalia class size which serves 24 students per laboratory section. We are requesting two additional units so that the lab group sizes in Hanford can be smaller, like those on our Visalia campus. Currently the students in Hanford are required to wait longer for their turn on the iWorx units and the laboratory student learning groups are too large.

Notes (optional):

Cost of Request (Nothing will be funded over the amount listed.): 7076

Related Documents:

College of the Sequoias Quotation.pdf
BIOL 31 Productivity Campus 2019.pdf
BIOL 31 FTES Campus - 2019.pdf

Link Actions to District Objectives

District Objectives: 2018-2021
District Objective 1.1 - The District will increase FTES by 1.75% over the three years
District Objective 2.1 - Increase the percentage of students who earn an associate degree or certificate (CTE and Non-CTE) by 5 percentage points over three years

Action: 2018-19 Provide Adequate Offerings in Major's Biology and General Education

The department needs to hire 2 full-time faculty to cover the growth in the biology major's courses without reducing the general education courses offered by the department.

Leave Blank: Essential for Operation
Implementation Timeline: 2019 - 2020
Leave Blank:
Leave Blank:
Identify related course/program outcomes: BIOL 1, 2, 21, 40
Person(s) Responsible (Name and Position): Biology full-time faculty; Dr. Robert Urtecho, Dean
Rationale (With supporting data): In order for the Biology Department to offer sufficient general biology sections, we need to replace one full-time tenure track faculty member. That position this year is being filled by a one-year temporary position. This position needs a permanent replacement.

BIOL 1 FTES increased from 26.1 in 2016 to 33.0 FTES in 2018. This represents a 26.4% increase. This increase was brought about by offering double sections of BIOL 1 in both Fall and Spring semesters. BIOL 2 saw an increase in FTES from 8.4 in 2016, to 15.6 in 2018; representing an increase of 85.7%. These courses both have 3 hours of lecture and 6 hours of lab per week. These courses represent a significant proportion of the workload of the faculty that teach them (84% of a full-time load). This large load necessitates a reduction in the other courses that these instructors teach. As a result, we are seeing a reduction in some of the general education course sections (BIOL 21 and BIOL 22) and BIOL 40 when those instructors teach the majors.

As noted above, we have also strained our ability to offer general education courses because we are offering more major's course sections (BIOL 1 and BIOL 2). Because of the large workload of these courses, the faculty rotate teaching them. We currently have only one faculty that teaches BIOL 2. We have two faculty that currently teach BIOL 1 but one faculty member would like to relinquish that course in favor of teaching more general education courses.

In order to adequately cover both major and general education classes, we are requesting to hire 2 full-time tenure-track positions for the Visalia campus. One position would be a replacement position and the other would be a new position. One newly hired faculty would teach BIOL 1 and Microbiology (BIOL 40) and the instructor hired to fill the other position would teach BIOL 2 and BIOL 21 and 20. This would provide the department with two faculty each that could teach BIOL 1 and BIOL 2. It would provide us with the coverage of general education we need and the Microbiology coverage.

Program Review - Biology

Priority: High
Safety Issue: No
External Mandate: No
Safety/Mandate Explanation:

Resources Description

Personnel - Faculty - Tenure-track Faculty to teach BIOL 1 and Microbiology. (Active)

Why is this resource required for this action?: This position replaces a faculty member who passed away last year. It is currently be covered by a one-year temporary position.

Notes (optional):

Cost of Request (Nothing will be funded over the amount listed.): 160000

Related Documents:

Biol 1 FTES.pdf

BIOL 40 FTES by Campus.pdf

Personnel - Faculty - New Tenure Track Faculty to teach BIOL 2 (2nd semester Biology Major's course) and BIOL 21 (Plant Biology) (Active)

Why is this resource required for this action?: The increase in the Majors course FTES has grown substantially; an increase of 85.7% from 2016 to 2018. The course requires the instructor to cover 3 hours of lecture and 12 hours of lab per week. This represents a significant percentage of a full-time load. When instructors teach this course the offerings of general education they teach must be reduced. Currently, there is on one instructor that teaches BIOL 2 and BIOL 21. Faculty need to rotate into and out of the major courses because of the significant demand these course place on them.

Notes (optional):

Cost of Request (Nothing will be funded over the amount listed.): 160000

Related Documents:

BIOL 2 FTES.pdf

BIOL - 2018 Program Review Data.pdf

Link Actions to District Objectives

District Objectives: 2018-2021

District Objective 2.1 - Increase the percentage of students who earn an associate degree or certificate (CTE and Non-CTE) by 5 percentage points over three years