Science and Engineering Department
Annual Unit Plan for Academic Year 2017-2018
October 2016

Describe Department/Unit

Mission/Connection to College Mission

The mission of the Science and Engineering Department is to provide the rigorous science and engineering foundation necessary for students to achieve the skills, knowledge, intellectual curiosity, and scientific literacy essential for a wide range of professional, technical and academic careers. For students pursuing careers outside of science, an understanding of the processes and an appreciation for science is provided. The department mission supports the mission of the district and college by striving to provide excellent educational programs, services, and opportunities for transfer and CTE students.

Report on Improvements Made and Gaps Identified in the Prior Year

Student Equity

Female Students are Underrepresented In Physics

Population:

Gender: Female

Analysis and Plan:

During the 2015-16 academic year, female students were underrepresented in:

Physics:

24% Female versus 62% Male

The lower enrollment number of female students in this subject area is the opposite of the lower enrollment number of male students throughout the college. The Science department does not have an action plan to bring these enrollment numbers into a 50%-50% balance between female and male students. Because students self-select themselves into subject areas, the Science department is currently only equipped to teach the students that voluntarily enroll themselves into their self-selected subject areas.

Female Students are Underrepresented In Engineering

Population:

Gender: Female

Analysis and Plan:

During the 2015-16 academic year, female students were underrepresented in:

Engineering:

33% Female versus 67% Male

The lower enrollment number of female students in this subject area is the opposite of the lower enrollment number of male students

throughout the college. The Science department does not have an action plan to bring these enrollment numbers into a 50%-50% balance between female and male students. Because students self-select themselves into subject areas, the Science department is currently only equipped to teach the students that voluntarily enroll themselves into their self-selected subject areas.

Male Students are Underrepresented In Biology

Population:

Gender: Male

Analysis and Plan:

During the 2015-16 academic year, male students were underrepresented in:

Biology:

69% Female versus 30% Male

The lower enrollment number of male students in this subject area reflects the lower enrollment numbers of male students throughout the college. The Science department does not have an action plan to bring these enrollment numbers into a 50%-50% balance between female and male students. Because students self-select themselves into subject areas, the Science department is currently only equipped to teach the students that voluntarily enroll themselves into their self-selected subject areas.

Male Students are Underrepresented In Physical Science

Population:

Gender: Male

Analysis and Plan:

During the 2015-16 academic year, male students were underrepresented in:

Physical Science:

65% Female versus 35% Male

The lower enrollment number of male students in this subject area reflects the lower enrollment numbers of male students throughout the college. The Science department does not have an action plan to bring these enrollment numbers into a 50%-50% balance between female and male students. Because students self-select themselves into subject areas, the Science department is currently only equipped to teach the students that voluntarily enroll themselves into their self-selected subject areas.

African American Students achieved a Low Success Rate in Biology

Population:

Ethnicity: African American

Analysis and Plan:

As demonstrated by the mathematically averaged success data of the last five academic years, African American students achieved low success rates in:

Biology:

49% Success

The low success rate of African American students in Biology (49% Success) reflects the average success rate of African American students College-wide (44% Success). Because this success gap is a College-wide problem, it is recommended that it should be addressed from a College-wide planning approach.

American Indian Students achieved a Low Success Rate in Biology

Population:

Ethnicity: American Indian

Analysis and Plan:

As demonstrated by the mathematically averaged success data of the last five academic years, American Indian students achieved low success rates in:

Biology:

54% Success

The low success rate of American Indian students in Biology (54% Success) reflects the average success rate of American Indian students College-wide (57% Success). Because this success gap is a College-wide problem, it is recommended that it should be addressed from a College-wide planning approach.

American Indian Students achieved a Low Success Rate in Physical Science

Population:

Ethnicity: American Indian

Analysis and Plan:

As demonstrated by the mathematically averaged success data of the last five academic years, American Indian students achieved low success rates in:

Physical Science:

56% Success

The low success rate of American Indian students in Physical Science (56% Success) reflects the average success rate of American Indian students College-wide (57% Success). Because this success gap is a College-wide problem, it is recommended that it should be addressed from a College-wide planning approach.

Outcomes Assessment: Overall Report

Over the past three years, many of the department's course Student Learning Outcomes (SLOs) were rewritten to either become more measurable or to better mirror the course objectives found in California's new Course Identification Numbering System (C-ID). Because of these changes, the department will conduct another round of SLO evaluations for all courses, regardless of each course's mandatory evaluation date. This department wide assessment will provide a baseline to compare against in future semesters.

Measure of Success: 90% of the courses consistently offered by the department will have their SLOs assessed.

Person Responsible: Each instructor will be responsible for his or her own course SLOs. Organization will be provided by the department chair.

Outcomes Assessment: Gaps Identified in Prior Year's Assessments

N/A

Type:

SLO

Target Missed/Gap Detected:

N/A

Type of Gap:

Analysis and Plan:

N/A

Progress Made on Program Review

General Sciences

Year of Last Program Review:

2015-16

Progress in the last year on two-year strategies:

(1.) The department is currently in the discussion stage concerning the modification of the program's PLO 1:

Demonstrate proficient preparation for upper division science courses at the appropriate transfer institution in the chosen emphasis: biology, chemistry, or physical science.

In practice, the department has found that this PLO is not easily measurable because it is too broadly worded.

(2.) The department is currently in the discussion stage with the college's Tehachapi Center concerning the expansion of Biology course offerings there. In particular, it has been proposed that an anatomy and physiology course could be offered at the center's newly remodeled classroom located in Tehachapi's old high school building.

(3.) The department's separate Engineering Program is in the process of being deleted. The department is working on replacing this Engineering Program with an Engineering Transfer Preparation emphasis, which would be located within the department's General Sciences Program.

Progress in the last year on five-year strategies:

N/A

Progress Made on Prior Year Initiatives

Develop resources and facilities to support science offerings at all sites.

The department chair has visited and communicated with all sites concerning their science equipment and facilities needs. The science courses *currently offered* at the sites are properly equipped, though some equipment must still be transported and shared between the sites.

Some courses still cannot be offered at the sites though due to their lack of proper lab facilities. For example, the planned 2015 remodels of the science labs at KRV and ESCC never took place, which limited the potential expansion of lab courses at these sites.

The Science department will remain in contact with the sites concerning course expansion and any potential remodeling of the facilities.

Continue to develop and extend industry and educational partnerships.

Biology professor Guck Ooi attended the Annual Aerospace Valley STEMposium and wrote a summary of the event's presentations and discussions. This report was shared and discussed within the department, and it was also forwarded to the College President. A major outgrowth of attending this symposium was making and obtaining contacts within the local Mojave area STEM community.

Develop Associate Degrees for Transfer (ADT) for chemistry, biology, and physics.

General Education unit relief for science degrees in the Associate Degrees for Transfer (ADT) initiative did not become available. Because unit relief did not become available, the department's General Science emphases in Chemistry, Biology, and Physics remain too unit heavy for their conversion into separate ADT degrees. Therefore, the department's General Science emphases were not converted into separate ADT degrees. The department will continue to model its three General Science emphases on the transfer requirements for the University of California (UC) system.

Plan Initiatives for Next Year

Initiatives for Next Academic Year

90% SLO Evaluations

Action Plan:

Over the past three years, many of the department's course SLOs were rewritten to either become more measurable or to better mirror the course objectives found in California's new Course Identification Numbering System (C-ID). Because of these changes, the department will conduct another round of SLO evaluations for all courses, regardless of each course's mandatory evaluation date.

Measure of Success:

90% of the courses consistently offered by the department will have their SLOs assessed.

Person Responsible:

Each instructor will be responsible for his or her own course SLOs. Organization will be provided by the department chair.

It <u>directly</u> addresses a college Strategic Goal or Objective

Strategic Goal #5: Organization Effectiveness

(2.) Meet and Exceed Internal and External Standards and Requirements:

Meet External Standards for SLO Assessment and Internal Standards for Program Review Completion

Contingency Plan for a Science Modular

Action Plan:

Due to the Main Building Modernization project's adverse effects on the scheduling of Biology and Chemistry labs, and the limitations of the current lab swing space (in particular the Chemistry lab's swing space), the department will create a contingency plan for obtaining a separate modular for Biology and Chemistry lab usage.

Measure of Success:

The department will create a document that details the physical requirements and costs of obtaining a separate modular for Biology and Chemistry lab usage. This contingency plan would be submitted as an action item if:

(1.) the College informs the science department that the Main Building will not be usable for the foreseeable future

OR

(2.) the science department runs into a scheduling issue with the Industrial Arts department (e.g. if the Industrial Arts department remodels room 192 West Wing where Chemistry labs currently take place)

OR

(3.) the science department's current swing space in 192 West Wing or 145 West Wing becomes unusable for other unforeseen reasons (e.g. safety issues, electrical, heat, broken pipes, etc)

OR

(4.) the science department runs out of room for scheduling biology and chemistry labs in the current swing space

Person Responsible:

The department's full time faculty members will contribute to the document. The department chair will also help organize the effort.

It directly addresses a college Strategic Goal or Objective

Strategic Goal #5: Organization Effectiveness

(4.) Improve Facilities and Maintenance

Strategic Goal #3: Access

(1.) Optimize Student Enrollment

Maintain Communication with the All Sites

Action Plan:

Maintain effective communication with the site directors, managers, and instructors at Eastern Sierra College Center (ESCC), Kern River Valley (KRV), and East Kern (EK) about their science facility needs and the possibility of expanding science course offerings at their respective sites.

Measure of Success:

Success will be defined as the department chair maintaining effective communication as documented through email.

Person Responsible:

The department chair

It directly addresses a college Strategic Goal or Objective

Strategic Goal #5: Organization Effectiveness

(3.) Increase Trust and Create a Collaborative Culture

Improve communication internally

Evaluate Resource Needs

Facilities

The information that is cut-and-pasted below is a department initiative found elsewhere in this Annual Unit Plan document.

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Information Technology

Problematic Equipment:

The Science department has approximately 25 laptops that are about 7-8 years old. These laptops are stored in a laptop cart, which is currently located in 198 West Wing.

Issue:

The department laptops are used several times during an academic year for laboratory activities and laboratory data analysis. While serviceable, the start-up times or the laptops typically take anywhere from 5 to 10 minutes.

Request:

If possible, reducing the laptop start-up times would be a desired improvement.

Marketing

None

Professional Development

None

Staffing Requests

1000 Category - Certificated Positions

Full-Time Faculty Replacement in Biology

Location:

ESCC Bishop, ESCC Mammoth Lakes

Justification:

At the ESCC Bishop and Mammoth sites, there is currently 1 faculty member teaching Biology, but he is retiring after the Spring 2017 semester. The purpose of this request for a full-time faculty hire is to replace this currently retiring faculty member.

(1.) Are there too few or too many students enrolling for particular classes or majors?

At the ESCC Bishop and Mammoth sites, a full-time Biology (BIOL) instructor would support the following courses: BIOL C105, BIOL C125, BIOL C145, BIOL C251, BIOL C255, BIOL C262; and the following majors (pathways): LVN and RN prerequisites, AA General Education/CSU General Education/IGETC, Kinesiology AA-T, Liberal Arts: Math & Science, and Psychology AA-T.

(2.) Are there too many courses or programs that are under capacity?

At the ESCC Bishop and Mammoth sites, BIOL courses are typically full and wait-listed.

(3.) Are courses “core mission”?

All BIOL courses at ESCC are “core mission.”

(4.) Are courses overscheduled?

ESCC offers all BIOL courses on a rotation, offering the courses as infrequently as possible, but as often as needed so that students can complete degrees and pathways within a two-year cycle. BIOL C105 is offered once every year, alternating between the Bishop and Mammoth sites. BIOL C125 is offered once every two years just prior to the start of the Licensed Vocational Nursing (LVN) program. BIOL C251 is offered once every year, alternating between the Bishop and Mammoth sites. BIOL C255 is offered once every year, alternating between the Bishop and Mammoth sites. BIOL C262 is offered once every year, alternating between the Bishop and Mammoth sites.

(5.) Is there capacity to offer courses or programs at different times and/or locations?

ESCC reviews the enrollment of all courses to determine if there is a need to reduce or increase the frequency of course offerings in any of the BIOL courses. At this time, no change is recommended.

(6.) Is there a workforce shortage in the service area or region?

There is a local shortage of Registered Nurses (RNs).

(7.) What are the costs and/or lost revenue from gaps between student demand and course or program capacity?

At ESCC, a BIOL course tends to have small wait-list of around 3-7 seats. After the first week, all the BIOL courses are typically 80-90% of capacity. There may be an opportunity to manage enrollment and/or provide support to decrease attrition and reduce the cost/lost revenue from gaps between student demand and course/program capacity.

(8.) In support of your proposal, provide the following data:

a. Size of wait-lists in the discipline

The Science department had a total of 38 wait-listed Biology students last academic year.

b. Department productivity, previous year

The Science department's Biology subject area had a productivity of 11.6 last academic year.

c. Number of faculty currently in the department

At the ESCC Bishop and Mammoth sites, there is currently 1 faculty member teaching Biology, but he is retiring after the Spring 2017 semester. The purpose of this request for a full-time faculty hire is to replace this currently retiring faculty member.

At the IWV campus, there are 2 faculty members who teach Biology, 1 faculty member who teaches Chemistry, and 1 faculty member who teaches Physical Science/Physics.

d. Number of adjunct faculty

At the ESCC Bishop and Mammoth sites there is 1 Biology adjunct, 1 Chemistry adjunct, 1 Geography adjunct, and 1 Geology adjunct.

e. Number of certificates awarded, previous year

At the ESCC Bishop and Mammoth sites, there were 11 LVN graduates. The current 2016 cohort of LVN students is 12, and they graduate in 2017.

f. Number of degrees awarded, previous year

At the ESCC Bishop and Mammoth sites, there were 9 LAS-Math & Sciences (2016), 4 AA-LVN (2015), 13 LAS-Math & Sciences (2015), and 1 Kinesiology AA-T (2015).

g. Core curriculum classes

At the ESCC Bishop and Mammoth sites, the core courses are BIOL C105/145

h. CTE classes with workforce data (wage/high demand):

At the ESCC Bishop and Mammoth sites, the CTE/workforce related courses are BIOL C125, 251, 255, 262.

i. Number of students at first day and census, previous year

Throughout the entire College, the Science department had 692 Biology students during first day enrollment and 552 Biology students during census day enrollment.

2000 Category - Classified Staff