

Instructional Units Program Review Year Five Update - Engineering/Physics/Physical Science Latest Version

This cycle is for Instructional Units to complete the Year Five Update of the Program Review Cycle.

Instructional Units Program Review Year Five Update

1. Program Update : Version by **Capes, Melinda** on **02/15/2022 18:37**

1a. Provide any important changes or updates within your program since your Program Review Year Three Update (2019-20). (New degrees, new curriculum, staffing changes, etc.)

The most significant change during this period was the transition to online learning during Spring 2020. In addition to transitioning lectures to an online format, labs were developed for the online environment (both fully online and hybrid formats). We lost one full-time faculty member due to retirement (Jeanne Bonner) and have submitted a box 2a request to replace her.

Also, engineering courses offering was modified. Classes which historically have been offered either Spring or Fall semester, are now offered both semesters. These classes include: Engin10, Engin20, Engin22, Engin25, Engin30 and Engin36.

1b. Please address the following enrollment data provided for your program.

1.b.1. What are the enrollment trends over the past 3 years, beginning with Fall 2018? (Please address census enrollment, census fill rate, and productivity (FTES/FTEF))

Physics: Census Enrollment has remained relatively stable (lowest was 2018FA at 272 and highest was 2019FA at 290). Census fill rate has steadily increased since 2018FA (88.9%-2018FA to 97.9%-2020FA). Productivity rate has remained somewhat steady at around 15 however, in 2020FA it dropped slightly to 14.8.

Engineering: Census Enrollment has increased from 97 in 2018FA and 96 in 2019FA to 140 in 2020FA. Census fill rate has increased as well from 81%-2018FA to 93%-2020FA. Productivity rate has jumped from 13.2-2018FA to 15.5-2020FA, after dropping to 12.9-2019FA.

1b. Please address the following enrollment data provided for your program.

1.b.2. What does the data suggest in terms of future needs/directions?

Physics: The data suggests that course offerings should remain roughly as they are at present (no significant increase or decrease in the number and variety of courses).

Engineering: Enrollment data suggests online course offering should be made available to students in the future, in addition to in person offering.

1c. Provide a brief update on the timeline for your program's goals as listed in your Program Review Year Three Update (2019-2020). If your program's goals are in progress or modified, please include action steps and responsible parties in your explanation.

PHYSICS:

Goal 1: Increase the number of course sections to relieve overcrowding.

We have increased the number of Phys-40 sections per year to 5 (3 in fall, 2 in spring). We are adding an additional section of Phys-35 for spring 2022.

Goal 2: Hire another full-time Physics professor. This was accomplished in 2019. However, with Jeanne Bonner's retirement, we are back to just 2 full-time faculty. There is frequent turnover in part-time Physics instructors as several have been hired full-time by other colleges. We have been overloading the remaining part-time instructors when we can. Therefore, an additional Box 2a application for physics has just been submitted. Action Steps: 1. Apply for Box 2A approval. 2. Advertise new position. 3. Perform paper screening. 4. Interview candidates.

Responsible Party(s): Kurt Crowder

Goal 3: Acquire \$3000 for a one-time purchase of equipment to replace older equipment, augmenting existing equipment to address increased class sizes, and for repairing broken equipment. The department recently acquired a set of new laptop computers to support engineering and physics. An LMC foundation mini-grant allowed us to purchase a set of LCR meters to support physics and engineering circuits labs. We can consider goal 3 complete. The ongoing need for other equipment is now in new goal #5 (below).

Goal 4: Obtain a dedicated budget for buying, repairing and maintaining equipment at the Brentwood Center. (Complete) The accomplishment of this goal allowed for the Physics Lab to purchase and provide sufficient equipment and materials at the Brentwood Center. This will allow equitable opportunities for students to access comparable lab materials and equipment at both Brentwood and Pittsburg sites.

New Goal 5: Obtain \$20,000 total for equipment needs for physics labs in Pittsburg, including replacements for nearly obsolete interface boxes (to run most physics labs using Pasco equipment). A set of 10 boxes costs \$10,000. Other equipment needs have also been identified (e.g., AC signal generators, digital oscilloscopes diode lasers, high-sensitivity microammeters, light meters, sound meters, and high quality electroscopes). This equipment would require another (est.) \$10,000. Action Steps: 1. Apply for RAP and any open Mini-Grants, 2. Work with the Foundation and Community Partners on possible donations, 3. Work with Business Office &/or DO on P.O. 4. Order equipment once funding has been secured.

Responsible Party(s): Robert Moore, D.O., Steve Goldenberg

ENGINEERING:

Goal 1: Invest in new technology, replace old equipment and repair broken one.

Action steps: New multimeters were acquired. Engineering presentations were designed and uploaded on a previously newly acquired LCD display screen for students to view and program advertising purposes. New PLA filament was acquired. Tensile testing equipment currently in need of repair/replacement. This goal is in progress. Responsible Parties: Francesca Briggs, Steve Goldenberg.

Goal 2: Increase the number of school laptops to accommodate class size and invest in new ones, which can support currently implemented engineering software.

Action steps: New laptops and software access were made available to students. This goal was completed. Responsible Parties: Francesca Briggs, Steve Goldenberg.

Goal 3: Recruit engineering students to work on independent study/projects in order to enhance their learning and facilitate their successful transition to local industry/national labs.
Action Steps: Students have been recruited every semester to work on independent study/projects in collaboration with the Chemistry program as well as the Child Development Department . Recruited students were tasked and completed projects including:
- computer aided design (CAD) projects and 3D printing projects in collaboration with the Chemistry program
- designed and built toys in collaboration with the Child Development Center
- designed, built and installed an outdoor shade structure for the Child Development Department outdoor area.
This goal was completed. Responsible Party: Francesca Briggs

New Goal 4: Obtain a dedicated budget for buying, repairing and maintaining equipment at the Brentwood Center.

New Goal 5: Bring engineering course offering to Brentwood site, while increasing the number of course offering per semester.

New Goal 6: Increase the number of instructional offered hours for Engin25, based on Engin25 course assessment outcomes.

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1c. Community and Labor Market Needs (Link Ed Code 78016 (http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=EDC§ionNum=78016), Title 5, 51022 ([https://govt.westlaw.com/calregs/Document/I69DDBCC0B6CB11DFB199EEE3FF08959C?viewType=FullText&listSource=Search&originationContext=Search+Result&transitionType=SearchItem&contextData=\(sc.Search\)&navigationPath=Search%2Fv1%2Fresults%2Fnavigation%2F0ad7140b0000016c911a16d7fb7f969b%3FNav%3dREGULATION_PUBLICVIEW%26fragmentIdentifier%3dI69DDBCC0B6CB11DFB199EEE3FF08959C%26startInde](https://govt.westlaw.com/calregs/Document/I69DDBCC0B6CB11DFB199EEE3FF08959C?viewType=FullText&listSource=Search&originationContext=Search+Result&transitionType=SearchItem&contextData=(sc.Search)&navigationPath=Search%2Fv1%2Fresults%2Fnavigation%2F0ad7140b0000016c911a16d7fb7f969b%3FNav%3dREGULATION_PUBLICVIEW%26fragmentIdentifier%3dI69DDBCC0B6CB11DFB199EEE3FF08959C%26startInde)))

No Value

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1d. Advisory Board Update and Analysis (CTE related only) Include dates of Advisory Board meetings in 2020-2021, and those completed or planned in 2021-2022.

No Value

Goals and Objectives			Modified	In Progress	Abandoned	Completed
Goal 1. Strengthen a culture of equity, diversity, inclusion, and racial justice. (District #2 and #4)						
Goal 2. Increase and maximize equitable opportunities for students to successfully complete courses and programs. (District #1 and #2)						
Recommended Actions	PHYSICS Goal 1: Increase the number of course sections to relieve overcrowding.	0 linked SLOs 0 resource requests				
	PHYSICS Goal 2: Hire another full-time Physics professor.	0 linked SLOs 0 resource requests				
	ENGINEERING New Goal 5: Bring engineering course offering to Brentwood site, while increasing the number of course offering per semester.	0 linked SLOs 0 resource requests				
	ENGINEERING New Goal 6: Increase the number of instructional offered hours for Engin25, based on Engin25 course assessment outcomes.	0 linked SLOs 0 resource requests				
Goal 3. Increase opportunities that will prepare students to enter high-demand and living-wage occupational fields. (District #3)						
Recommended Actions	ENGINEERING Goal 3: Recruit engineering students to work on independent study/projects in order to enhance their learning and facilitate their successful transition to local industry/national labs. Action Steps: Students have been recruited every semester to work on independent study/projects in collaboration with the Chemistry program as well as the Child Development Department . Recruited students were tasked and completed projects including: - computer aided design (CAD) projects and 3D printing projects in collaboration with the Chemistry program - designed and built toys in collaboration with the Child Development Center - designed, built and installed an outdoor shade structure for the Child Development Department outdoor area. Responsible Party: Francesca Briggs This goal was completed.	0 linked SLOs 0 resource requests				
Goal 4. To better support students in accomplishing their academic and career goals – from entry to completion/transition – and to enhance course-level and program-level achievement, expand and deepen educational, workforce, and community partnerships. (District #3)						

Goals and Objectives			Modified	In Progress	Abandoned	Completed
Recommended Actions	PHYSICS Goal 3: Acquire \$3000 for a one-time purchase of equipment to replace older equipment, augmenting existing equipment to address increased class sizes, and for repairing broken equipment. This goal was completed.	0 linked SLOs 0 resource requests				
	PHYSICS New Goal 5: Obtain \$20,000 total for equipment needs for physics labs in Pittsburg, including replacements for nearly obsolete interface boxes (to run most physics labs using Pasco equipment). A set of 10 boxes costs \$10,000. Other equipment needs have also been identified (e.g., AC signal generators, digital oscilloscopes diode lasers, high-sensitivity microammeters, light meters, sound meters, and high quality electroscopes). This equipment would require another (est.) \$10,000.	0 linked SLOs 0 resource requests				
	ENGINEERING Goal 2: Increase the number of school laptops to accommodate class size and invest in new ones, which can support currently implemented engineering software. This goal was completed.	0 linked SLOs 0 resource requests				
	ENGINEERING Goal 1: Invest in new technology, replace old equipment and repair broken one. Action steps: New multimeters were acquired. Engineering presentations were designed and uploaded on a previously newly acquired LCD display screen for students to view and program advertising purposes. New PLA filament was acquired. Tensile testing equipment currently in need of repair/replacement. This goal is in progress. Responsible Parties: Francesca Briggs, Steve Goldenberg	0 linked SLOs 0 resource requests				
Goal 5: Effectively utilize institutional resources to meet the needs critical to the College mission. (District #4 and #5)						
Recommended Actions	PHYSICS Goal 4: Obtain a dedicated budget for buying, repairing and maintaining equipment at the Brentwood Center.	0 linked SLOs 0 resource requests				
	ENGINEERING New Goal 4: Obtain a dedicated budget for buying, repairing and maintaining equipment at the Brentwood Center.	0 linked SLOs 0 resource requests				

2. Vision for Success Goals Update : Version by Capes, Melinda on 02/15/2022 18:37

2a. The following table lists the *Vision for Success* indicators that we must align to as a College and as a District. Please look at your program data (Tableau) for each of the following *Vision for Success* indicators. Please address all indicators that are relevant to your program and provide a status update on your program goals from your Program Review Year Three Update. Please include action steps if your goal(s) has been modified and an explanation if your goal(s) has been abandoned. *

**NOTE - Please copy and paste the table below in your response and complete accordingly.*

Vision for Success Indicators and ACCJC Indicator	Program Set Goals (from PR Year 3 Update)	Status (Indicate Modified, Completed, or Abandoned)	Timeline	Responsible Parties	Action Steps/ Explanation
Course Success					
Degrees (AA, AS, ADT)					
Certificates of Achievement					
Unit Reduction					
CTE Jobs					

Vision for Success Indicators and ACCJC Indicator	Program Set Goals (from PR Year 3 Update)	Status (Indicate Modified, Completed, or Abandoned)	Timeline	Responsible Parties	Action Steps/ Explanation
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Course Success	Course success rates: PHYS 77.4% PHYS 74.5%	PHYS: Goal completed by attaining 77.6% Course Success Rate PHYS: Based on data goal was modified to 70%.	PHYS: 2022-23	D. Gravert	PHYS: provide opportunities for students to share study skills and solutions for better time management
Degrees (AA, AS, ADT)					
Certificates of Achievement					
Unit Reduction					
CTE Jobs					

2b. The *Vision for Success Goal 5 - Equity* is designed to reduce the equity achievement gap on course success for disproportionately impacted (DI) student populations. The College has identified the following three disproportionately impacted (DI) populations: African-American, economically disadvantaged students (low income), and foster youth students.

Please review your program data (Tableau) for each of the aforementioned DI populations, and provide a status update on your program goal(s) for your previously selected DI population(s) in your Program Review Year Three Update. If your goal(s) has been modified please include action steps and if your goal(s) has been abandoned please provide an explanation.*

**NOTE - Please copy and paste the table below in your response and complete accordingly.*

Course Success by DI Population	Program Set Goals (PR Year 3 Update)	Status (Indicate Modified, Completed or Abandoned)	Timeline	Responsible Parties	Action Steps/ Explanation
African American					
Low Income					
Foster Youth					

Course Success by DI Population	Program Set Goals (PR Year 3 Update)	Status (Indicate Modified, Completed or Abandoned)	Timeline	Responsible Parties	Action Steps/ Explanation
African American	Success rate goal 77% (Modified 70%)	Modified to 70% based on recent data and transition out of pandemic	2022-23	B. Moore/K. Crowder	Probable impact of remote learning environment; we are now offering more in-person sections
Low Income	82% success rate goal	In progress	2022-23	B. Moore/K. Crowder	(same as above)
Foster Youth	Success rate goal 78% (Modified 70%)	Modified to 70% based on recent data and transition out of pandemic	2022-23	B. Moore/K. Crowder	(same as above)

3. Assessment Status Update and CSLO Assessment Effectiveness : Version by Capes, Melinda on 02/15/2022 18:37

a. Please review the data provided on the assessment status of courses in your discipline for Cycle Two (2017/18-2020/21). For any courses that were not assessed in Cycle Two please list them in the table below in your response including why they were not assessed, when you are going to assess them, and who is going to assess them.*

**NOTE - Please copy and paste the table below in your response and complete accordingly (add extra rows if needed).*

Course Name/ Number	Reason course was not assessed	When course will be assessed	Faculty Responsible for Course Assessment
Course Name/ Number	Reason course was not assessed	When course will be assessed	Faculty Responsible for Course Assessment
Phys-37		Fall 2021	Trevor Gonzalinajec
Phys-42		Fall 2021	Bob Moore
Physc-5		Fall 2021	Dennis Gravert

All Engineering courses have been assessed in Cycle Two. *ENGIN-045* was assessed in *eLumen* on 09/15/2021.

b. Discuss the results of any CSLO assessments performed this year. What changes, if any, are planned to improve student success (ex. pedagogy, assessment instruments are not appropriate to measure, CSLO rewritten etc.)?

Phys-15 CSLO4: Our assessment notes the need for new and better lab equipment. All of our courses will benefit from having more equipment (students will learn better in smaller lab groups). The number of lab groups is limited at present by the amount of working lab equipment.

Phys-40 CSLO4: Our assessment recommended consideration of adding a 1-unit support course for Phys-40.

Engin-025 CSLO2: Course assessment suggests the need for SolidWorks availability to all students during the first two weeks of the semester already, when it is crucial for all students to work on practice labs and master fundamental graphic skills. Assessment shows most students impacted by the lack of available equipment early on in the semester were below proficiency.

Engin-030 CSLO4: Assessment underlines the importance of conducting Materials Science experiments for all students, either individually or in smaller groups, in order to increase proficiency. Existing lab equipment is limited and does not allow for running materials science labs in smaller student groups.

Engin-045 CSLO2: Assessment underlines the importance of conducting electrical circuit experiments for all students, either individually or in smaller groups, in order to increase proficiency. Existing lab equipment, specifically breadboards, are limited and do not allow for running labs in smaller student groups or individually.

4. Course Outline of Record Updates : Version by Capes, Melinda on 02/15/2022 18:37

Please review the data provided in eLumen for the status of the Course Outline of Records (COORs) in your discipline. Please indicate in the table below any COOR(s) for your discipline that has not been updated and identify the faculty member responsible for submitting the updated COORs) to the Curriculum Committee by November 1, 2021.*

**NOTE - Copy and paste the table below in your response and complete accordingly (add extra rows if necessary).*

Course (Enter Course Name ex. ENGL-100)	Faculty Responsible for COOR Update

All Physics COORs have been updated in Cycle Two.
All Engineering COORs have been updated in Cycle Two.

Impact of Resource Allocation