Program: Engineering
Division: STEM
Date: 2 October 2019
Writer(s): Keith Level
SLO/SAO Point-Person: Keith Level

Audience: Deans, Vice Presidents of Student Services and Academic Services, All Planning and Allocation Committees. This document will be available to the public.

Uses: This Program Review will be used to inform the campus and community about your program. It will also be used in the processes of creating Division Summaries, determining College Planning Priorities and allocating resources. A final use is to document fulfillment of accreditation requirements.

Please note: Program Review is NOT in itself a vehicle for making requests. All requests should be made through appropriate processes (e.g. Instructional Equipment Request Process) or directed to your dean or supervisor.

Time Frame: This Program Review should reflect on program status during the 2019-20 academic year. It should describe plans starting now and continuing through 2020-21. This document also provides the opportunity to describe more long-term plans (optional).

Sections: The first section of this Program Review focuses on general program reflection and planning. The second section has specific questions to be filled out by all programs this year. The third section is a review of curriculum. The fourth section is a review of data for CTE programs. Only programs with curriculum need to complete Section 3, and only CTE programs need to complete Section 4.

Topics: The Program Review Glossary defines key terms. Writers should review this glossary before writing: https://bit.ly/2LqPxOW

Help: Contact Karin Spirn: kspirn@laspositascollege.edu

Instructions:
1) Please respond to each question as completely as possible.
2) If the requested information does not apply to your program, write "Not Applicable."
3) Optional: Meet with your dean to review this document before October 21.
4) Send an electronic copy of this form to Karin Spirn and your Dean by October 21.

Links:
Program Review Home Page: https://bit.ly/2Y0j7fW
Fall 2018 Program Review Updates : https://bit.ly/2GIWzsM
Frequently Asked Questions: https://bit.ly/2DHLnfj

Section One: Program Snapshot

No Significant Changes Option

☐

Contact person: _____

By marking an X in the box above, the writers of this Program Review indicate that there have been no significant changes to their program or their program's needs in the past year. In this case, programs may opt not to complete Program Review Section One: Program Snapshot. **Programs must still complete all other sections (as applicable).**

A. **Program Description: Briefly describe your program, including any information or special features of your program that will provide helpful context for readers of this Program Review.**

   Examples of program descriptions can be found here: https://bit.ly/2VwjNvZ

There are actually two fairly distinct programs within Engineering:
(1) Engineering Transfer and (2) Engineering Technology.

Engineering Transfer has been present at LPC since the 1990s, and is the focus of Engineering-titled programs at most California Community Colleges. Engineering Technology (ET) started at LPC in Fall 2014, and started as a collaboration between Lawrence Livermore National Laboratories, Growth Sector, Las Positas College, and other agencies. The ET program just started its 6th cohort of students.

Engineering Transfer seeks to have LPC students complete lower-division coursework in Math/Physics/Engineering and other subjects, and transfer as a Junior to a four-year university as an Engineering major. LPC currently averages around 25-30 Engineering Transfer students each year, in a variety of Engineering majors, to a wide range of universities, mainly within California.

Engineering Technology at LPC seeks to have students complete two years of coursework, leading to an A.S. degree in Engineering Technology, and then to find employment as a technician or technologist in engineering or engineering-related industry. Initially, the ET program was focused solely on veterans students, but has in 5 years' time expanded to include about half veterans students, and half non-veterans students.

There is also a distinction between ENGR courses and the Engineering major, particularly in Engineering Transfer. Engineering majors take close to 50 units of courses in *other* disciplines—including Math, Physics, Chemistry, and Computer Science—in addition to the ENGR courses needed to transfer. None of these other majors have students who are required to take Engineering courses.

B. IR Data Review: Describe any significant trends in your program's data from the office of Institutional Research and Planning. (Note: Not all Programs have IR data packets available; if your program does not have a data packet, you may note that in the response box). You may also discuss any other data generated for your program by the Office of Institutional Research and Planning.

IR Data packets are available here: https://bit.ly/2IYaFu7

Course Success Rates Dashboard can be found at the bottom of this page: https://bit.ly/2Y9vGpl

Fall headcounts for students in ENGR classes, since 2014, have been 138-161-152-122-125;
Spring headcounts for students in ENGR classes, since 2015, have been 105-139-165-167-155;

Spring numbers have in recent years been higher, due to more ENGR courses offered on the schedule. Because the schedule has not been consistent from year-to-year, it is more challenging to draw conclusions just from the headcount numbers.

Female enrollments have increased, from 10% to 15% in the Fall, and from 9% to 17% in the Spring, both encouraging trends. For BS graduates in Engineering, the US National average is currently about 18% women.

In terms of Race & Ethnicity, the biggest change in the last 5 years has been in the percentage of Latino students, increasing from 26% to 35% of student headcounts. During this same time period, the percentage of white students decreased from 45% of the total student headcounts, down to 32%.

Engineering would benefit from more accurate data on how many students are transferring in Engineering majors to universities in California. I believe this is the most important metric in the department, yet currently is not included in the data set. The graphic below is from the New funding model, which allocates 1.5 points, for every "Successful transfer to a four-year university". My question regarding this: Is there data currently used for this item, and, if so, does it reflect students who transfer to private universities / out of state universities? Also related, how would this measure reflect a student who may have completed his/her lower division courses at two or more community colleges? Would those community colleges share a fraction of the 1.5 points?

Student Success Allocation

Student Success Allocation—Measures	All Students	Promise Grant Premium	Pell Grant Premium
Associate degrees for transfer granted	4	4	6
Associate degrees granted (excluding ADTs)	3	3	4.5
Baccalaureate degree granted	3	3	4.5
Credit certificates (16 units or more) granted	2	2	3
Completion of transfer-level mathematics and English courses within first academic year of enrollment	2	2	3
Successful transfer to four-year university	1.5	1.5	2.25
Completion of nine or more CTE units	1	1	1.5
Attainment of regional living wage	1	1	1.5

California Community Colleges

August 27, 2018

Engineering (ENGR)					
	Term				
	Fall 2014	**Fall 2015**	**Fall 2016**	**Fall 2017**	**Fall 2018**
WSCH	463	415	512	468	502
FTES	15.3	13.5	16.5	15.0	15.5
FTEF	1.2	1.5	1.2	1.5	1.5
Productivity (WSCH/FTEF)	371.0	271.1	410.3	319.5	342.7

Engineering (ENGR)					
	Term				
	Spring 2015	**Spring 2016**	**Spring 2017**	**Spring 2018**	**Spring 2019**
WSCH	461	540	637	760	717
FTES	15.1	17.5	20.7	24.7	23.0
FTEF	1.3	1.6	1.9	2.0	2.1
Productivity (WSCH/FTEF)	346.1	334.4	335.6	374.2	341.8

The numbers above show (a) gradual growth in WSCH in both semesters between 2014-2019, (b) mostly constant FTES during Fall 2014-2019, (c) an increase in FTES during Spring 2014-2019, and (d) productivity numbers that have stayed mostly constant, between about 335-345, for WSCH/FTEF.

ENGR is well below the arbitrarily defined targets of 400 or 450 or 525 WSCH/FTEF, but the following factors do limit enrollments in ENGR classes:

1.   Engineering is one of the most challenging of all majors, and several of the courses have some of the highest-level prerequisite courses of any courses offered at LPC. In addition, the courses which do the "filtering" of Engineering majors, are typically not ENGR classes, but more frequently in Math and Physics.

2. Lab space usually limits the number of students in any lab setting to 24. This is true of classes taught in Room 1822 and Room 1859.

Mark an X before each area that is addressed in your response.		Definitions of terms: https://bit.ly/2LqPxOW					
	Community Partnerships/Outreach		Facilities, Supplies and Equipment, Software		LPC Planning Priorities		Services to Students
	Course Offerings		Financial/Budgetary		LPC Collaborations		SLO/SAO Process
	Curriculum Committee Items		Human Resources		Pedagogy		Student Equity
	External Factors		Learning Support		Professional Development		Technology Use

C. Other Data Review (Optional): Describe any significant findings based on other data regarding your program. Possible sources of relevant information might include, but are not limited to, the following:

- o **Data generated by your program**
- o **CEMC Data**
- o **Labor Market Data**

I have compile partial data of students who have transferred for the last 8-10 years, and currently about 25 students each year transfer to a four-year university. Below is the data for Fall 2018.

Engineering Transfer Students for Fall 2018
FROM LAS POSITAS COLLEGE
Prepared by Keith Level, Engineering Transfer Program Coordinator

Name	Transfer Institution	Major
	UC Davis	Aerospace Engrg
	Univ of the Pacific	Computer Science
	UC San Diego	Mechanical Engrg
	Univ of Florida / FSU	Chemical Engrg
	San Francisco State Univ	Electrical Engrg
	UC Davis	Mechanical Engrg
	Calif Maritime Academy	Mechanical Engrg
	UC Davis	Mechanical Engrg
1	CSU Sacramento	Mechanical Engrg
1	San Jose State / UC Davis	Mechanical Engrg
1	San Francisco State Univ	Materials Engrg
1	UC Irvine	Chemical Engrg
1	San Francisco State Univ	Electrical Engrg
1	UC Davis	Electrical Engrg
1	UC Merced	Mechanical Engrg
1	CSU Sacramento	Civil Engineering
1	UCLA	Astrophysics
1	UC Davis	Electrical Engrg
2	UC Berkeley	Elect Engrg / Computer Sci
2	UC Davis	Materials Engrg
2	San Jose State	Electrical Engrg
2	San Francisco State Univ	Computer Science
2	San Jose State	Aerospace Engrg
2	CSU Sacramento	Mechanical Engrg
2	USC	Computer Engrg / Comp Sci

27 |

Mark an X before each area that is addressed in your response. | Definitions of terms: https://bit.ly/2LgPxOW

	Community Partnerships/Outreach		Facilities, Supplies and Equipment, Software		LPC Planning Priorities		Services to Students
	Course Offerings		Financial/Budgetary		LPC Collaborations		SLO/SAO Process
	Curriculum Committee Items		Human Resources		Pedagogy		Student Equity
	External Factors		Learning Support		Professional Development		Technology Use

D. Accomplishments: What plans from the 2018 Program Review or any previous Program Reviews/Updates have been achieved and how? You may also describe achievements that were not planned in earlier Program Reviews. Please highlight any positive impacts to students.

A new STEM coordinator, Jean O'Neal-Opipari, was hired in Summer 2019, and now serves in similar functions to the Student Support specialist position. This position is critical to managing the Engineering Technology program.

A new course, ENGR 50 (*Intro to Electronics Systems*), has been developed by adjunct instructor Mark Newton, and is scheduled to be offered for the first time during Spring 2019 semester. This course is designed for the Engineering Technology program, and will provide ET students an Electronics course option in completing their A.S. degree.

There have been some preliminary discussions with local high-tech employers, including Gillig Inc (Livermore) and HNTB (Oakland), regarding possible collaborations with LPC.

At the most recent Engineering Advisory meeting, a motion was approved to modify the AS degree in Engineering Technology, replacing 2 welding courses with the new ENGR 50 class. This change will be discussed further at the next Engineering Advisory meeting.

Mark an X before each area that is addressed in your response.				Definitions of terms: https://bit.ly/2LqPxOW			
	Community Partnerships/Outreach		Facilities, Supplies and Equipment, Software		LPC Planning Priorities		Services to Students
	Course Offerings		Financial/Budgetary		LPC Collaborations		SLO/SAO Process
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	External Factors		Learning Support		Professional Development		Technology Use

E. Uncompleted Plans: What plans from your 2018 Program Review have not been achieved and why?

<div style="color:red">

Short Term:
- Developing Guided Pathways for Engineering Transfer and Engineering Technology students supports D1, *Streamline existing processes*
- Getting SLO information more up-to-date supports D1, *Streamline existing processes*
- Communication between the various parties in ET supports A2, A3, B2, B3, C3 and D1 above.
- Growing the Engineering Transfer program in a manageable way supports A2, A3, A6, C3, D1, and D2 above
- New buildings supports A2, A3, B2, C3, C4, and D1 above.

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Mark an X before each area that is addressed in your response.		Definitions of terms: https://bit.ly/2LqPxOW	
Community Partnerships/Outreach	Facilities, Supplies and Equipment, Software	LPC Planning Priorities	Services to Students
Course Offerings	Financial/Budgetary	LPC Collaborations	SLO/SAO Process
Curriculum Committee Items	Human Resources	Pedagogy	Student Equity
External Factors	Learning Support	Professional Development	Technology Use

F. Challenges, Obstacles and Needs: Describe any significant challenges, obstacles or needs for your program. Please highlight any negative impacts for students.

<div style="color:red">

Challenges and Obstacles are no different than mentioned in the last 3-4 Program Reviews.

On-Going: ENGR courses have not experienced the unit inflation which other similar disciplines have experienced. For example, of the 8 courses currently offered in ENGR, there are zero 5-unit classes, two 4-unit classes, 5 3-unit classes, and 1 2-unit class. Why does this matter? The Full time Engineering instructor must teach 4-5 courses every semester to achieve a minimum full load, which is too large a teaching load.

Scheduling has become a particular challenge. Monday-Wednesday afternoon class scheduling is particularly difficult by not allowing any full-time faculty to teach during these times. Spring Semester 2020 already has some conflicts for Engineering majors, which may have an impact on their ability to get admitted to their university of choice.

The New Funding model may pose as great a challenge to ENGR classes as anything else mentioned in this Program Review. Engineering, by the metrics employed, does not appear to be strong in terms of enrollment, or in maintaining other aspects of its program. It does, however, continue to transfer 25-30 students every year. If the entire college takes a dramatic hit in revenue from the state, which is not unreasonable, Engineering would be extremely vulnerable to cuts and reduction of courses. If this were to happen, Engineering students would likely take Engineering courses at nearby community colleges, which would have a negative affect on ENGR enrollments, but also a negative effect on higher-level Math (MATH 3-5-7) and Physics (PHYS 1B-1C-1D) course enrollments.

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Mark an X before each area that is addressed in your response.		Definitions of terms: https://bit.ly/2LqPxOW	
Community Partnerships/Outreach	Facilities, Supplies and Equipment, Software	LPC Planning Priorities	Services to Students
Course Offerings	Financial/Budgetary	LPC Collaborations	SLO/SAO Process
Curriculum Committee Items	Human Resources	Pedagogy	Student Equity
External Factors	Learning Support	Professional Development	Technology Use

G. Short Term Planning: What are your most important plans (either new or continuing) for next year? Describe plans starting now and continuing through AY 20-21.

1. Modifying the current AS requirements for the AS degree in Engineering Technology.
2. Maintain or increase enrollment in ENGR classes.
3. Maintain currency of ENGR curriculum.
4. Creating AS degrees for Engineering majors.
5. Creating certificates for students taking courses in Engineering areas.
6. Studying the ramifications of making some ENGR courses C-ID compliant. ENGR 44 (Intro to Circuit Analysis) will be affected the most, and will likely experience a drastic decrease in enrollments, should the prerequisites/corequisites change to match the C-ID descriptors.
7. Update CSLOs and create meaningful PSLOs.

Mark an X before each area that is addressed in your response.				Definitions of terms: https://bit.ly/2LqPxOW			
	Community Partnerships/Outreach		Facilities, Supplies and Equipment, Software		LPC Planning Priorities		Services to Students
	Course Offerings		Financial/Budgetary		LPC Collaborations		SLO/SAO Process
	Curriculum Committee Items		Human Resources		Pedagogy		Student Equity
	External Factors		Learning Support		Professional Development		Technology Use

H. Long Term Planning (Optional): Please detail any long-term plans for the next 3-5 years. (Only if you have significant plans, such as implementation of a grant project, creation of long-term initiatives including those using restricted funds such as Equity or SSSP, construction and outfitting of a new building).

Not applicable

Mark an X before to each area that is addressed in your response.				Definitions of terms: https://bit.ly/2LqPxOW			
	Community Partnerships/Outreach		Facilities, Supplies and Equipment, Software		LPC Planning Priorities		Services to Students
	Course Offerings		Financial/Budgetary		LPC Collaborations		SLO/SAO Process
	Curriculum Committee Items		Human Resources		Pedagogy		Student Equity
	External Factors		Learning Support		Professional Development		Technology Use

Section Two: Current Topics (Required for All Programs)

A. **Program-Set Standard (Instructional Programs Only):** The program-set standard is a baseline that alerts programs if their student success rates have dipped suddenly. There may be many valid reasons a program does not meet the Program Set Standard; when a program does not meet this standard, they are simply asked to examine possible reasons and note any actions that should be taken, if appropriate.

Program-set standard data can be found on this page:
http://www.laspositascollege.edu/research/outcomes.php

(Data for AY 18-19 will be available by the beginning of Fall 2019).

Did your program meet its program-set standard for successful course completion?
_X_yes _____no

If your program did not meet your program-set standard, discuss possible reasons and how this may affect program planning or resource requests.

Not applicable. Program Review needs to identify which majors are populating courses in other departments. For example, ENGR majors provide a significant boost to the MATH enrollment numbers, this is not reflected in any of the data.

B. **SLOs/SAOs: Describe an example of how your program used course SLO data (SLOs) or SAO data from last year (2018-19) to impact student learning, access, achievement, or other services to students. (Copy the box below if you would like to discuss multiple examples).**

Course (SLOs only): Not Completed. (Keith Level was on sabbatical for Spring 2017)
SLO or SAO:
Describe the quantitative or qualitative results:
Discuss any actions taken so far (and results, if known):
Discuss your action plan for the future:

C. **Program SLOs (Degree/Certificate granting programs only**): Describe an example of how your program used program-level SLO data (PSLOs) from last year (2018-19) to impact student learning or achievement. (Copy the box below if you would like to discuss multiple examples).

Degree/Certificate: Program Level SLOs do not currently exist in ENGR.

Program SLO:
Describe the quantitative or qualitative results:
Discuss any actions taken so far (and results, if known):
Discuss your action plan for the future:

D1. SLO/SAO Progress Review: To see if your program is up to date with the creation of SLO/SAOs, please consult the list available here: https://bit.ly/2LqgoKv. List any courses or services areas that do not have SLOs or SAOs approved. These SLOs/SAOs need to be submitted to eLumen by November 18 to become active for Spring 2020; please work with your SLO/SAO coordinator.

ENGR is up to date in creation of SLOs. ENGR does, however, need to modify and update several SLOs, and this is planned to be submitted to eLumen this fall.

D2. This question has been removed.

D3. This question has been removed.

E. This question has been removed.

F. Student-Centered Funding Formula (SCFF): The state funding allocation model has shifted to include socio-economic status and student achievement metrics. LPC will begin to be funded by this model by AY 21-22. The district and college are using this opportunity to develop projects that support these funding considerations and the needs of our students. The projects should help LPC achieve the goals listed below.

Goals for SCFF Projects
- Ensuring eligible students receive financial aid, if desired   - Removing barriers that hinder students from moving toward their goals   - Offering additional information and support about educational pathways   - Offering academic support that increases English/math completion in the first year   - Enhancing career readiness through coursework   - Increasing completion of degrees and certificates   - Increasing transfers and transfer readiness

F1. SCFF Actions Taken: Describe one initiative or action your program or area has taken in support of one of the goals in the list above.
- **What was the action?**

- **What was the result, if known?**
- **If your action or initiative was successful, please explain why and whether it could be used in other areas or scaled for use across the campus.**
- **If your action or initiative was not successful, please indicate why (lack of resources, unforeseen variables, etc.)**
- **If you did not take any actions in support of the goals above, you may write "N/A."**

Enhancing Career Readiness: The Engineering Technology program has graduated 37 students with an AS degree since its inception in 2014, and has 18 of those students have earned full-time employment at Lawrence Livermore National Laboratories as technicians or technologists.

Increasing transfers and transfer readiness: As mentioned earlier, reliable data on where community college transfer students, in a given major, transfer to is currently inadequate. Accurately accounting for the number of transfer students would help in LPC's score in SCFF.

F2.

Future Strategies (optional): Please describe any possible strategies or actions that your program or the college could use to support the goals listed above. What resources would be needed?

More or expanded laboratory space. This would most likely occur from other disciplines vacating space to move into new construction.

Both Engineering Transfer and Engineering Technology students would benefit from more internship opportunities. Some of this is starting to happen; making this a higher priority would likely lead to more opportunities.

G.

Student Equity and Achievement Program: To ensure equitable outcomes for vulnerable student populations, Las Positas College plans to close equity gaps in the areas listed below. For each area/metric, the listed impacted groups have had proportionately lower rates than other groups.*

Area/Metric	Impacted Groups
Access: Enrollment at LPC	Black or African American (Female), Black or African American (Male), Filipino (Female), White (Female)
Readiness: Completion of both transfer-level Math & English	American Indian or Alaska Native (Female), Black or African American (Female), Black or African American (Male), Hispanic or Latino (Male/All), First Generation (Male/All), Foster Youth (Female), Foster Youth (Male), LGBT (All)
Retention: Retention from Fall to Spring	Black or African American (Female/All), First Generation (Female/All), Foster Youth (Male)
Completion: Completion of an Associate Degree, Certificate	American Indian or Alaska Native (Male/All), Asian (Male), Black or African American (Male/All), Native Hawaiian or other Pacific Islander (Female), Native Hawaiian or other Pacific Islander (Male), Foster Youth (Male), LGBT (Female), LGBT (Male)
Completion: Transfer to a Four-Year Institution	Disabled (Male/All), Black or African American (Female), Hispanic or Latino (Male), Native Hawaiian or other Pacific Islander (Female), Native Hawaiian or other Pacific Islander (Male), First Generation (Female), Foster Youth (Male), LGBT (Female)

*The full list of impacted groups with supporting data can be found here: https://bit.ly/2XZVGDb

G1. Equity Actions: Describe any actions your program has taken in the past two years (2017-2019) or actions currently in progress to improve the metrics above for the impacted groups listed (for example, to increase the ability for African American students to enroll in classes at LPC, or to increase the ability of LGBT students to complete Associate's Degrees or Certificates). What has been the effect of these actions, if known?

> No specific actions taken. The program aims to provide as much support to students as possible, and to maintain the integrity of the course content.

G2. Equity Challenges: Describe any challenges your program has faced in promoting equity and equity-based decision making in the metrics listed above (or any other areas).

> Increasing the numbers of women enrolling in Engineering majors has been a major challenge, with the attached graphic showing the percentages of BS Engineering degrees earned by women, between 2007 and 2015, with current percentages at about 20% females earning BS degrees in Engineering
>
> **BACHELOR'S DEGREES BY GENDER, 2016**
>
> | | Male 79.2% | | | | | | | Female 20.8% |
> |---|---|---|---|---|---|---|---|---|
>
> | | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
> |---|---|---|---|---|---|---|---|---|---|
> | Female | 18.1% | 18.0% | 17.8% | 18.1% | 18.4% | 18.9% | 19.1% | 19.9% | 19.9% |
> | Male | 81.9% | 82.0% | 82.2% | 81.9% | 81.6% | 81.1% | 80.9% | 80.1% | 80.1% |
>
> .
>
> The percentage of women enrolled in LPC ENGR courses has increased slightly in recent years.

H.

Program Review Suggestions (optional): What questions or suggestions do you have regarding the Program Review forms or process?

> Is there ever any verbal discussion about the issues discussed in Program Review? I'm assuming all Program Reviews are thoroughly read, I don't understand why there is never any follow-up discussion about the Program Review issues.
>
> Assuming that allocations adjust according to Program Review, there needs to be more transparency about this process, e.g., which programs received a boost in resources, possibly those programs which experienced a decline in resources.

Section Three: Curriculum Review
(Programs with Courses Only)

The following questions ask you to review your program's curriculum. To see the last outline revision date and revision due date:

> **1. Log in to CurricUNET**
> **2. Select "Course Outline Report" under "Reports/Interfaces"**
> **3. Select the report as an Excel file or as HTML**

Curriculum Updates

A. Title V Updates: Are any of your courses requiring an update to stay within the 5 year cycle? List courses needing updates below.

Course Outline Report

Course	Last Outline Revision	Revision Due Date
ENGR 22 Engineering Design Graphics (Active)	11/9/2005	11/9/2010
ENGR 23 Engineering Design Graphics (Pending)	11/9/2005	11/9/2010
ENGR 25 Computational Methods for Engineers and Scientists (Active)	4/30/2018	4/30/2023
ENGR 26 Computational Methods for Engineers and Scientists (Pending)	4/30/2018	4/30/2023
ENGR 35 Statics (Active)	12/8/2006	12/8/2011
ENGR 37 Applied Statics and Materials (Active)	3/19/2018	3/19/2023
ENGR 44 Introduction to Circuit Analysis (Active)	12/4/2017	12/4/2022
ENGR 44 Introduction to Circuit Analysis (Pending)	12/4/2017	12/4/2022
ENGR 46 Materials of Engineering (Active)	5/7/2018	5/7/2023

Yes:
ENGR 23 (ENGR 22 with a proposed number change), and ENGR 35.

B. Degree/Certificate Updates: Are any degrees/certificates requiring an update to do changes to courses (title, units) or addition/deactivation of courses? List needed changes below.

The AS degree in Engineering Technology needs to be modified to include ENGR 50 as one of the course options leading to the degree. A proposed change is shown in Appendix 2 attached.

Certificates in Engineering-related courses need to be created, in response to SCFF changes.

AS degrees in Engineering will be added in the next several months.

C. DE Courses/Degrees/Certificates: Detail your department's plans, if any, for adding DE courses, degrees, and/or certificates. For new DE degrees and/or certificates (those offered completely online), please include a brief rationale as to why the degree/certificate will be offered online.

No immediate plans

Section Four: CTE Updates
(CTE Programs Only)

A. Labor Market Conditions: Examine your most recent labor market data. Does your program continue to meet a documented labor market demand? Does this program represent a training need that is not duplicated in the college's service area? (Please note: your labor market data should be current within two years. Contact Vicki Shipman or the current CTE Project Manager for access to data).

The LPC Engineering Technology department has a limited number of graduates.

B. Advisory Boards: Has your program complied with advisory board recommendations? If not, please explain.

The Engineering Technology Advisory Board currently meets twice a year. The creation of a Machining Course at LPC, Welding 10, led by Welding instructor Scott Miner, resulted from recommendations from the Advisory Board, and was offered at LPC for the first time during Spring semester 2019. An additional course, ENGR 50, Fundamentals of Electronics, also discussed at an Advisory Board meeting, will be offered for the first time during Spring semester 2020.
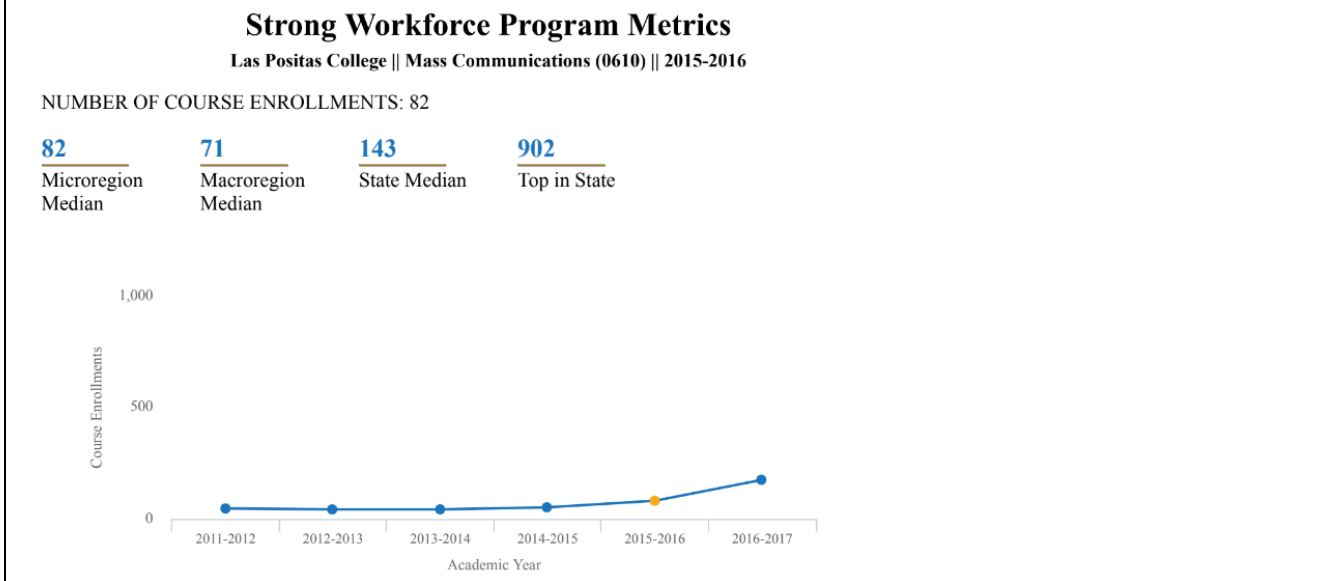
C.

Strong Workforce Program Metrics: Utilizing LaunchBoard, review the Strong Workforce Program Metrics. Review the data and then answer the following questions.

(Contact Vicki Shipman or the current CTE Project Manager for help accessing the data).

C1. Does your program meet or exceed the regional and state medians **for increased enrollments, completions, and/or transfer since your last program review**? If not, what program improvements may be made to increase this metric?

<div style="color:red">

Related solely to the Engineering Technology program (see Appendix data at end of this report):

The 82 enrollments is less than the statewide 143 median value (see graphic below)

</div>

Strong Workforce Program Metrics
Las Positas College || Mass Communications (0610) || 2015-2016

NUMBER OF COURSE ENROLLMENTS: 82

82	71	143	902
Microregion Median	Macroregion Median	State Median	Top in State

C2. Does your program meet or exceed the regional and state medians **for students gaining employment in their field of study**? If not, what program improvements may be made to increase this metric?

<div style="color:red">

No data provided due to the insufficient number of data points (<10)

</div>

C3. Does your program meet or exceed the regional and state medians **for student employment rates after leaving the college**? If not, what program improvements may be made to increase this metric?
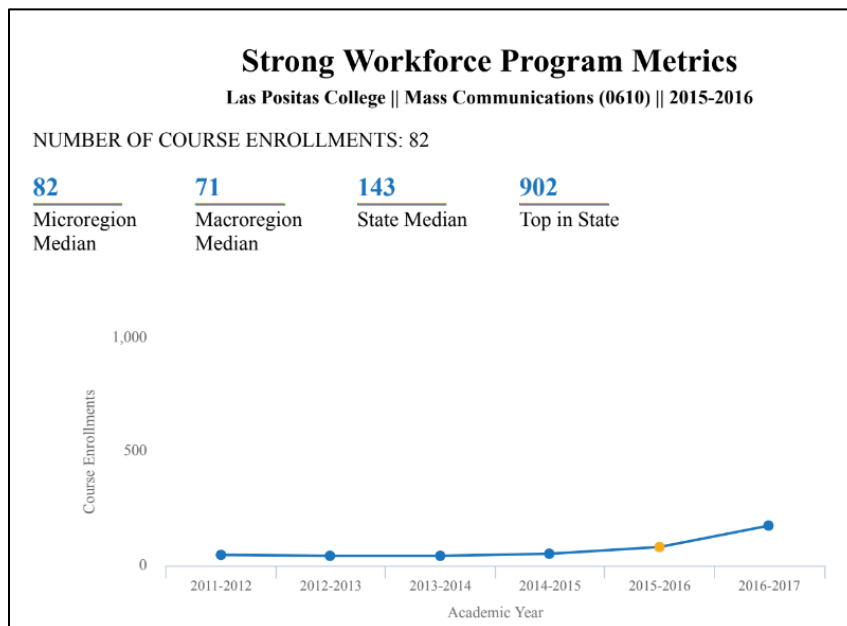
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See C2 above

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C4. Does your program meet or exceed the regional and state medians **for increased student earnings and median change in earnings?** If not, what program improvements may be made to increase this metric?

See C2 above

Strong Workforce Program Metrics
Las Positas College || Mass Communications (0610) || 2015-2016

NUMBER OF COURSE ENROLLMENTS: 82

82	71	143	902
Microregion Median	Macroregion Median	State Median	Top in State

Engineering Technicians, Except Drafters, All Other in 4 California Counties

Engineering Technicians, Except Drafters, All Other (SOC 17-3029):

All engineering technicians, except drafters, not listed separately.

Related O*NET Occupations:
Non-Destructive Testing Specialists (17-3029.01)
Electrical Engineering Technologists (17-3029.02)
Electromechanical Engineering Technologists (17-3029.03)
Electronics Engineering Technologists (17-3029.04)
Industrial Engineering Technologists (17-3029.05)
Manufacturing Engineering Technologists (17-3029.06)
Mechanical Engineering Technologists (17-3029.07)
Photonics Technicians (17-3029.08)
Manufacturing Production Technicians (17-3029.09)
Nanotechnology Engineering Technologists (17-3029.11)
Nanotechnology Engineering Technicians (17-3029.12)

Occupation Summary for Engineering Technicians, Except Drafters, All Other

2,298	+3.6%	$33.67/hr
Jobs (2019)	% Change (2019-2028)	Median Hourly Earnings
23% above National average	Nation: +5.1%	Nation: $30.35/hr

Occupational Programs

4 Programs (2017)	**20** Completions (2017)	**302** Openings (2017)

CIP Code	Program	Completions (2017)
15.0000	Engineering Technology, General	11
15.0304	Laser and Optical Technology/Technician	8
15.9999	Engineering Technologies and Engineering-Related Fields, Other	1
15.0101	Architectural Engineering Technology/Technician	0

Appendix 2:
PROGRAM OF STUDY
Fall 2019

Engineering Technology - A.S. - Associate of Science Degree

The Associate of Science in Engineering Technology program at Las Positas College is designed for those who want a hands-on engineering career with a focus on mechanical technology in an applied setting. The emphasis is on Mechanical Engineering applications and developing an understanding of how engineering, technology and manufacturing principles are applied in practice. The program provides students with foundational knowledge in mathematics, critical thinking, problem solving, and engineering design, as well as skills in manufacturing, fabrication, and welding so that students are able to adapt to the ever-changing modern industrial workplace. Students may also choose to continue their education towards a degree in a related engineering discipline.

Career Opportunities in Engineering

Graduates of the program may find employment as mechanical technicians, mechanical technologists, stationary engineers, or in other applied engineering fields and may collaborate with scientists, engineers, designers, and manufacturing professionals.

Required Core: (27 units)	Units
ENGR 10 Introduction to Engineering	2
ENGR 22 Engineering Design Graphics	3
MATH 39 Trigonometry	4
MATH 30 College Algebra for STEM	4
PHYS 10 Descriptive Physics	3
PHYS 10L Descriptive Physics Lab	1
WLDT 62A Beginning GTAW and GMAW Theory	1
WLDT 62AL Beginning GTAW and GMAW Skills Lab	2
WLDT 63 Welding Layout and Fitting	2
WLDT 79 Manufacturing Processes	2
WLDT 10 Machining for the Metal Trades	3

LIST A: Select one (3 units)	Units
WRKX 94 Occupational Work Experience/Internship	3
WRKX 95 General Work Experience	3

LIST B: Select one (3-4 units)	Units
ENGR 37 Applied Statics and Materials	3
ENGR 50 Intro to Electronic Systems	4

TOTAL UNITS IN THE MAJOR	**33-34**

PROGRAM BASED GENERAL EDUCATION REQUIREMENT: (3 units)	Units
CMST 1 Fundamentals of Public Speaking	3

GENERAL EDUCATION AND ELECTIVES	Units
	24

See the Las Positas College General Education Pattern for Associate of Science Degree for listing of areas and courses. Double counting courses in GE and the major is permissible. The number of units that may be double counted will depend on the entry point to the degree program and the optional course(s) taken. Consult with an adviser or a counselor to plan the courses necessary to achieve your academic goal.

Total Units	**60-61**