

# INSTRUCTIONAL COMPREHENSIVE PROGRAM PLANNING AND REVIEW (CPPR) FOR 2021

Only to be completed by those programs scheduled for the year according to the institutional comprehensive planning cycle for instructional programs (i.e., every four years for CTE programs and five years for all other instructional programs), which is produced by the Office of Instruction. Faculty should meet with their dean prior to beginning this process. Training is available to support faculty completing this work.

**Cluster:** DEWD

**Program:** Engineering

**Current Academic Year:** 2020-21

**Last Academic Year CPPR Completed:** 2015-16

**Current Date:** 2/23/2021

## NARRATIVE: INSTRUCTIONAL CPPR

Please use the following narrative outline:

### I. GENERAL PROGRAM INFORMATION

#### Program Mission (optional)

The mission of the engineering program, which is part of the Engineering and Technology Division, is to support the Mission of Cuesta College by enabling our students to achieve their academic, transfer, workforce preparation, career advancement, and personal goals.

The primary goal of the engineering program is to transfer students to a 4-year school for the completion of their BS in engineering. Cuesta offers just about every engineering class that can be transferred to the 4-year school.

A second minor role of the program is to train students for vocational careers in CAD (Computer Aided Design). These classes are also part of several vocational departments such as architecture, construction, and welding.

#### Brief history of the program

The engineering program was started by Arnold Frank, aka Colonel Frank (1922-2015).



Colonel Frank was the camp commander of Camp San Luis Obispo and he was very influential in getting the land that Cuesta is on donated from the Army. He was hired as

the first engineering instructor at Cuesta, a role he served in until his retirement in 1990. When he first started the program, engineering was part of what was known as “Engineering, Math, and Sciences”. He was the chair of the program. Somewhere along the lines, engineering split from math and sciences to be part of “Engineering and Technology”. There is a plaque outside of room 4115 (the old drafting room) for his dedication to the college. Colonel Frank primarily taught drafting and surveying.

Jeff Jones was hired in 1990 to replace Colonel Frank. Jeff was not content to teach drafting and surveying so he greatly expanded the program to include classes such as: Statics, Dynamics, Strength of Materials, CAD, and programming.



The engineering program at Cuesta is the largest community college engineering program in California with an average annual enrollment of 730 students enrolled in engineering classes. This does not include those students who are enrolled in pre-engineering classes such as math, chemistry, and physics. The designation of largest is based on the criteria of the number of students who are enrolled in ENGR250- Statics, a sophomore course, not just those that claim to be engineering majors.

Include significant changes/improvements since the last Program Review

- Was able to replace the surveying equipment that was purchased used in 1962, so after 70 years it was due to be replaced. The new equipment is state of the art.
- Established about 18 sections of Dual Enrollment.
- Created a Manufacturing program.
- Received a \$1.2 million NSF grant to support engineering students.
- Participate in the I-USE NSF grant.
- Received C-ID approval for almost all of the engineering courses.
- Revised ENGR248 from 1 unit to 2 units to include more hands-on projects.

List current faculty, including part-time faculty

<b>Current Staff and Qualifications: Name</b>	<b>Education</b>	<b>Engineering Teaching Assignment</b>
Eric Beaton	MS-MATE	Part Time
Ray Dienzo	MS- EE	Part Time
Eltahry Elghandour	Ph.D.- ME	Part Time
Matt Fouroy	MS- ME	Part Time
Jeff Jones	MS- CE	Full Time
Pavel Popov	MS-CE	Part Time
Alan Ross	Ph.D.- EE	Part Time

Describe how the Program Review was conducted and who was involved

The program review was written by Jeff Jones with additional information provided by others within the department.

**II. PROGRAM SUPPORT OF DISTRICT'S [MISSION STATEMENT](#), [INSTITUTIONAL GOALS](#), [INSTITUTIONAL OBJECTIVES](#), AND/OR [INSTITUTIONAL LEARNING OUTCOMES](#)**

Identify how your program addresses or helps to achieve the [District's Mission Statement](#).

- To transfer to a 4-year school to get a BS in engineering.

Identify how your program helps students achieve [Institutional Learning Outcomes](#).

Students who complete the AS Engineering Degree will meet the following ILOs:

**ILO 1 Personal, Academic, and Professional Development**

- Utilize theory and basic skill sets for operating, maintaining, and troubleshooting relevant applications and specific technologies needed to support industries.
- Display traits of hard work, self-motivation, personal integrity, and positive attitude that will contribute to the success of the project and the company. Identify how your program addresses or helps to achieve, and/or operational planning initiatives.

**ILO 2 Critical Thinking and Communication**

Students in all engineering courses improve their critical thinking skills by analyzing complex problems in both lecture and laboratory settings. In the laboratory in particular, students are required to develop experimental plans. Students improve their communication skills by answering questions in both sentence and mathematical formats.

Apply fundamental principles of mathematics, physics and chemistry to electrical and mechanical theory and problem solving.

#### ILO 3 Scientific and Environmental Understanding

All courses in the engineering program help students improve scientific understanding. The lab component of engineering courses is essential for the outcome of drawing conclusions based on the scientific method, computations or experimental and observational evidence.

#### ILO 6 Technical and Information Fluency

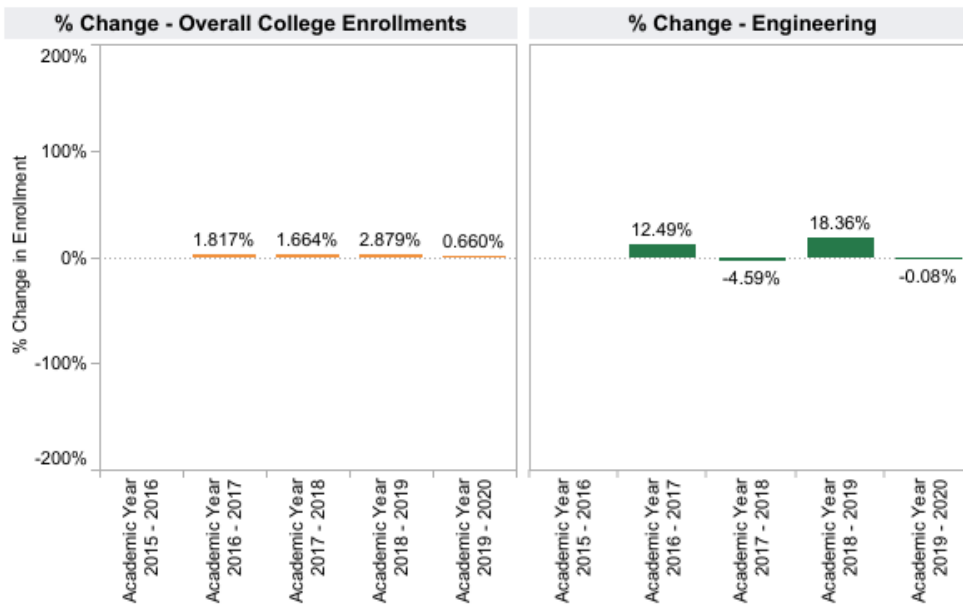
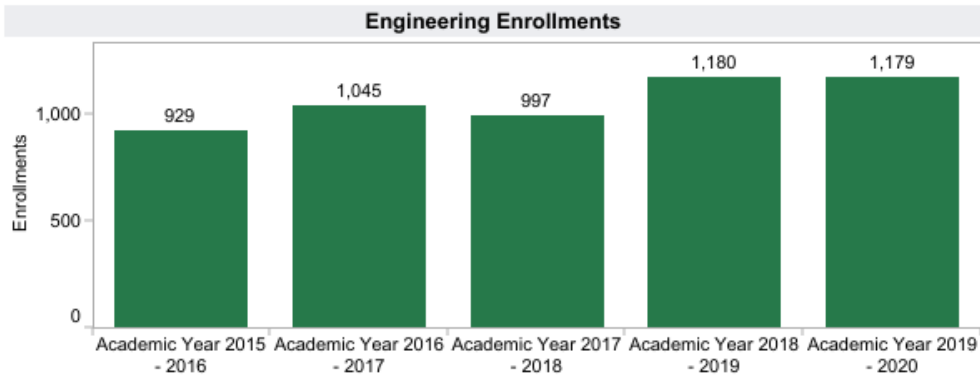
Many of the laboratory experiments require students to measure data using computer controlled instrumentation. Other classes such as ENGR210 requires students to write computer programs, whereas ENGR226 and 228 require students to draw objects according to engineering standards.

### III. PROGRAM DATA ANALYSIS AND PROGRAM-SPECIFIC MEASUREMENTS

(Where applicable the success metrics are aligned with the Student Success Metrics/SCFF).

#### SLOCCCD Program Review Data - Enrollment

Department: Engineering      Course: All      Dual Enrollment: All      Prison: All



Enrollment: Duplicated count of students who completed greater than 0 units in positive attendance courses or were present on census for all other accounting methods.

The engineering program has seen an average increase of 6.6% compared to the college had an increase of only 1.8%. Much of this increase can be attributed to dual enrollment. In the previous program review (2010 to 2015), the average engineering enrollment was 730 compared to this cycle of 1066, a gain of 336!

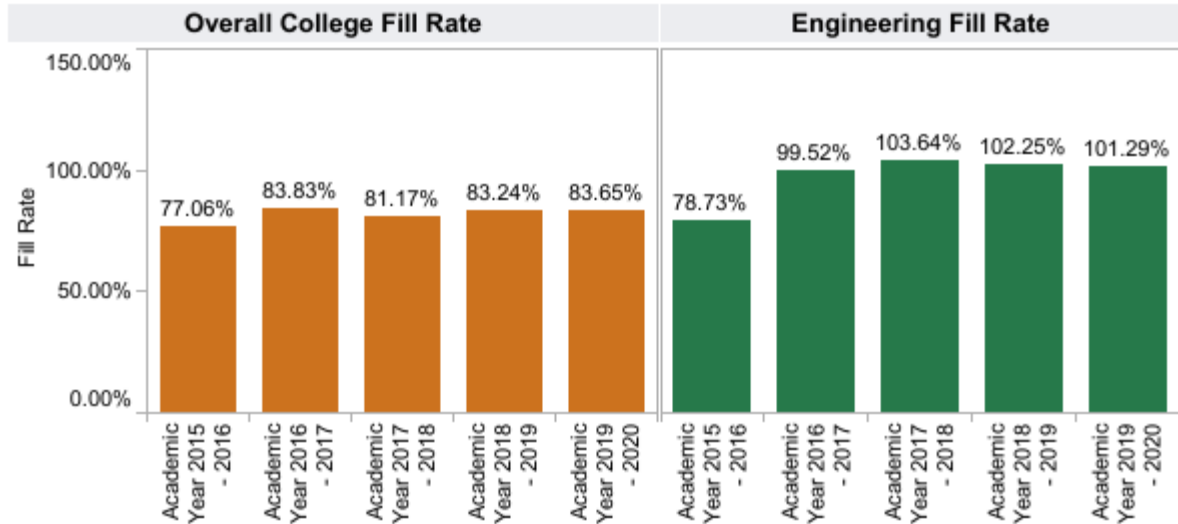
## SLOCCCD Program Review Data - Student Demand (Fill Rate)

**Department:**  
Engineering

**Course:**  
All

**Dual Enrollment:**  
All

**Prison:**  
All



Fill Rate: The ratio of enrollments to class limits. Cross listed class limits are adjusted appropriately. Also, courses with zero class limits are excluded from this measure.

The engineering program has seen an average fill rate of 97.1% compared to the college had an average file rate of only 81.8%. Much of the engineering high fill rates can be attributed to dual enrollment.

[General](#)

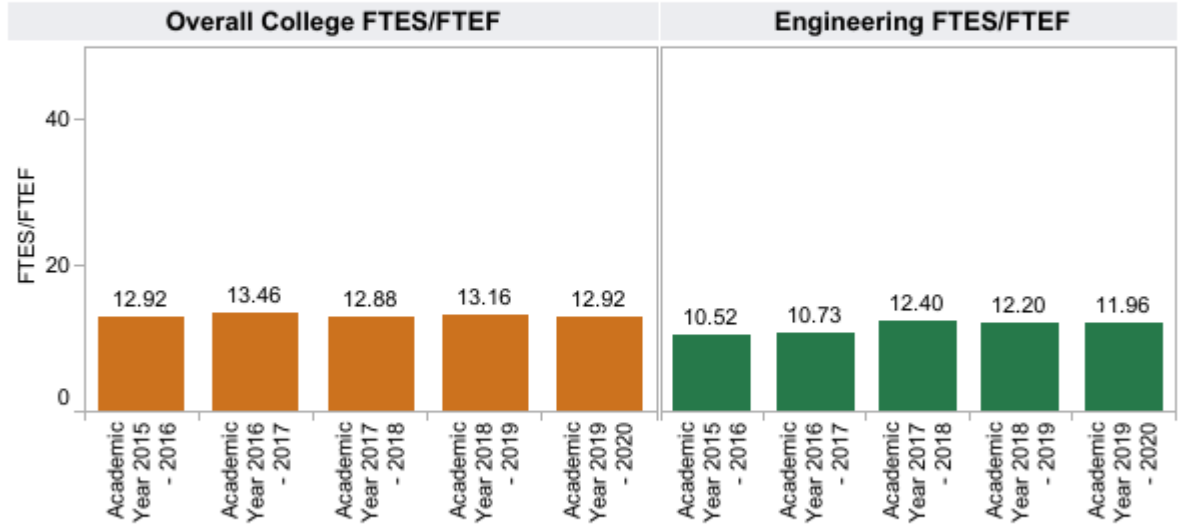
**SLOCCCD Program Review Data - Efficiency (FTES/FTEF)**

**Department:**  
Engineering

**Course:**  
All

**Dual Enrollment:**  
Not Dual Enrollment

**Prison:**  
All



FTES/FTEF: The ratio of total FTES to Full-Time Equivalent Faculty  
(SXD4 Total-Hours/17.5)/XE03 FACULTY-ASSIGNMENT-FTE)

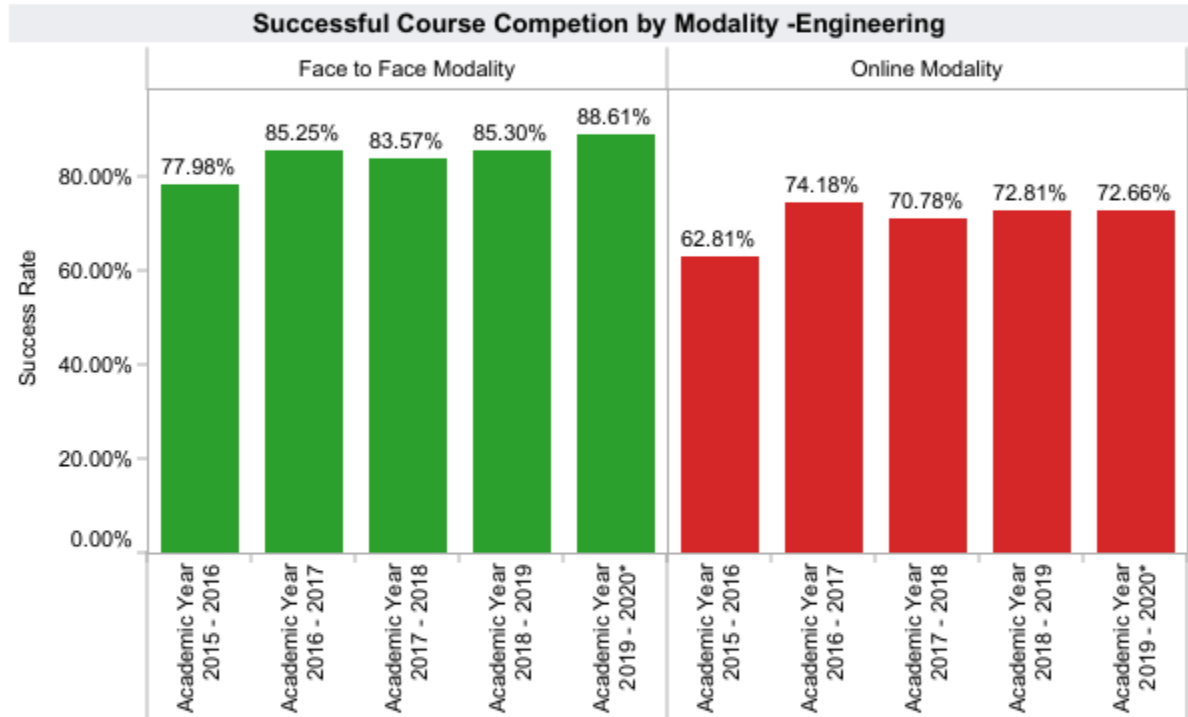
Although improvements have been made but there may be some improvements. Since engineering has many labs that are limited to 24 to 28 students it will be hard to make drastic changes.

## SLOCCCD Program Review Data: Successful Course Completion

Select Department:  
Engineering

Course:  
All

Legend:  
■ Face to Face Modality  
■ Online Modality



**Successful Course Completion by Modality Table - Engineering**

		Academic Year 2015 - 2016	Academic Year 2016 - 2017	Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*
Face to Face Modality	Department Success Rate	77.98%	85.25%	83.57%	85.30%	88.61%
	Total Department Enrollments	447.0	556.0	487.0	551.0	588.0
Online Modality	Department Success Rate	62.81%	74.18%	70.78%	72.81%	72.66%
	Total Department Enrollments	484.0	488.0	510.0	629.0	592.0

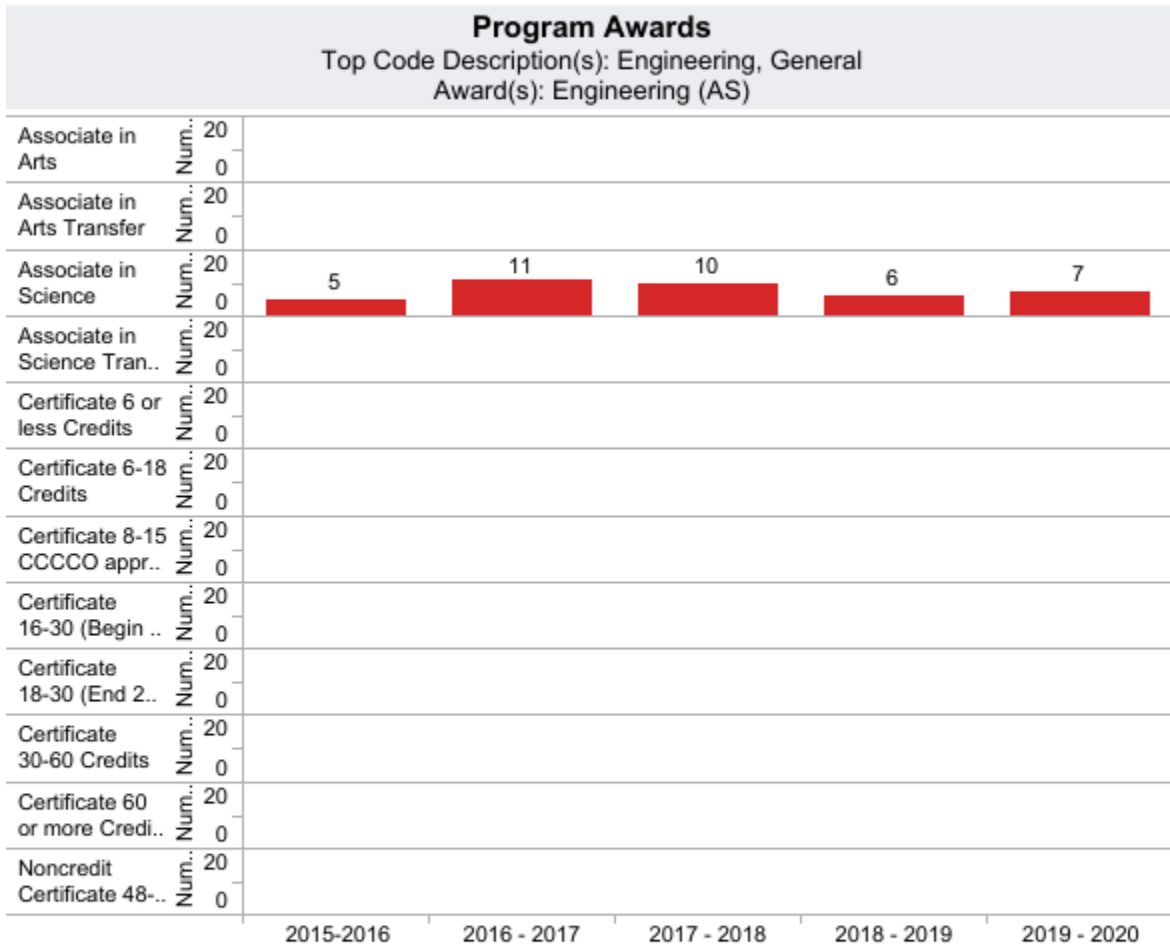
It is hard to believe that there is this much difference between the two modalities since most of the courses are only taught online. One major difference is with ENGR226 in which there is always one section of each. The f2f section has an average completion rate of 81.5% compared to the online version of only 54.4%. Most of the engineering classes have very dedicated students by having completed many calculus and physics classes. ENGR226- Engineering Drawing is the exception, there are no prerequisites. Many of the online students in ENGR226 are first time students or in a major that doesn't have much rigor and they are taking it online thinking it will be easier. This is a disaster to think that and there is no way to prevent this from happening.



## SLOCCCD Program Review Data: Degrees and Certificates Awarded

**Program:**  
Engineering, General

**Award Type:**  
All



**Program Awards Table**

Award Type	Award	2015-2016	2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020
Associate in Science	Engineering (AS)	5	11	10	6	7
	<b>Total</b>	5	11	10	6	7
<b>Grand Total</b>		5	11	10	6	7

Program Awards: The number of degrees and certificates awarded by program type

The numbers are low because the program is a transfer program and students are encouraged NOT to complete their GE but to focus on the transfer courses.

## SLOCCCD Program Review Data: Successful Course Completion

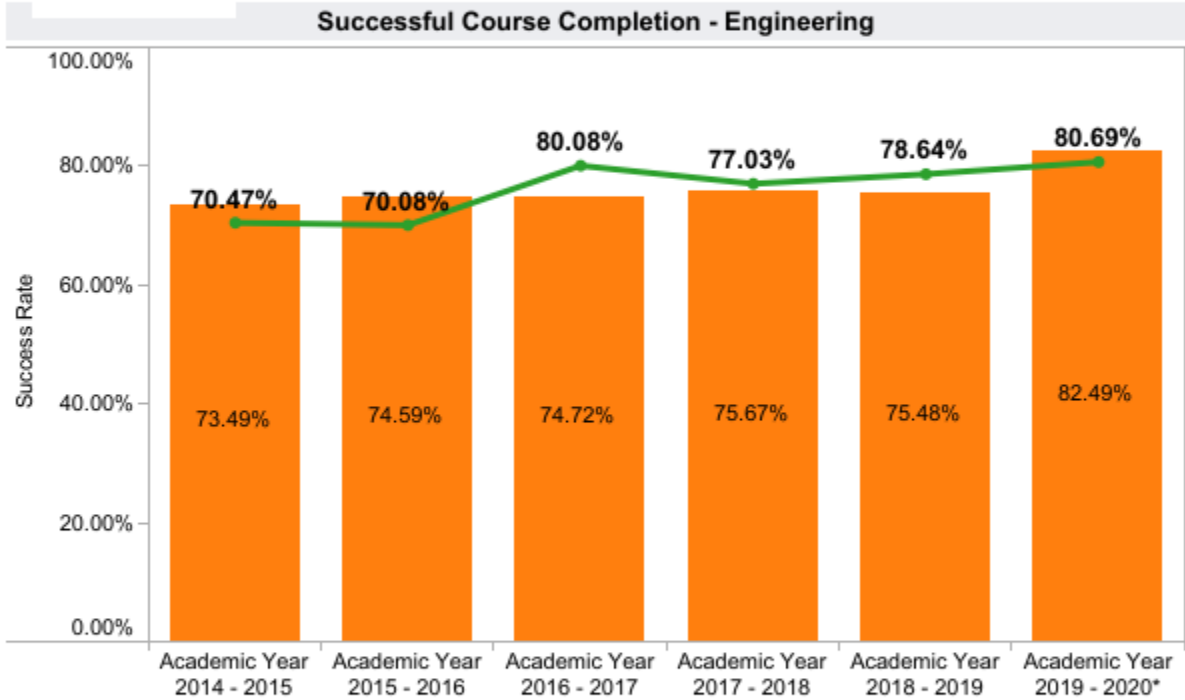
Select Department:  
Engineering

TERM\_ID  
All

### Measure Names

- Department Success Rate
- Overall College Success Rate

COURSE  
All

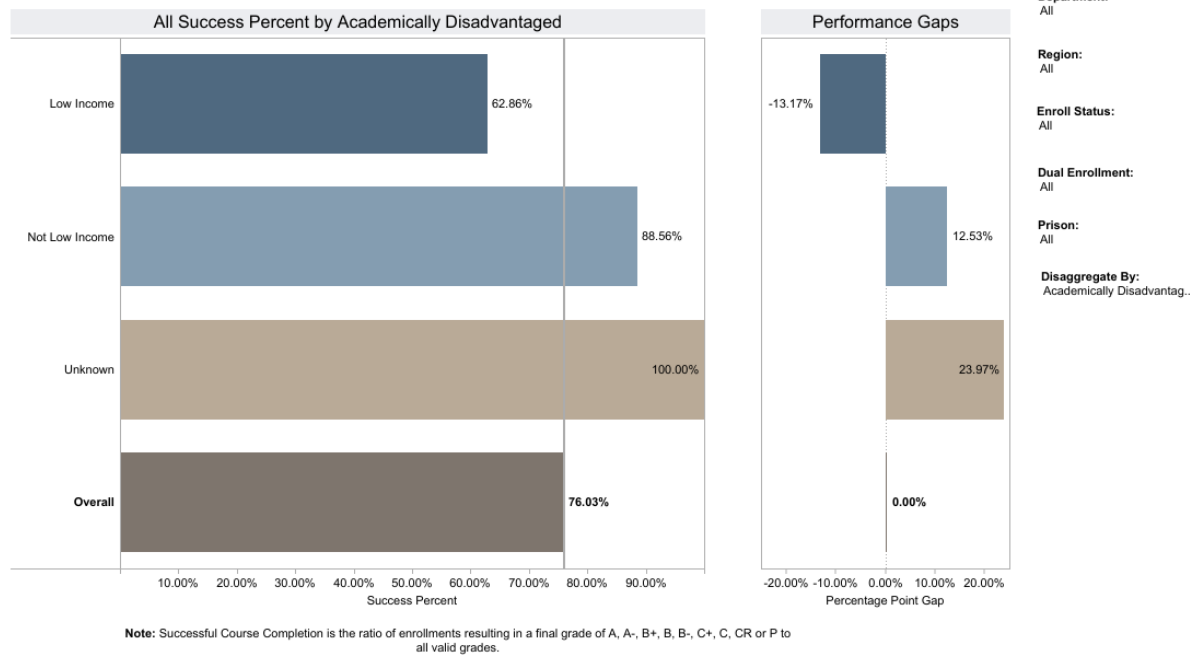


### Engineering Success Rate Table

	Academic Year 2015 - 2016	Academic Year 2016 - 2017	Academic Year 2017 - 2018	Academic Year 2018 - 2019	Academic Year 2019 - 2020*
Department Success..	70.08%	80.08%	77.03%	78.64%	80.69%
Total Enrollments	931	1,044	997	1,180	1,180

Over the past 6 years the department average is 76.2% compared to the average college goal of 76.1%, thereby meeting the goal.

### Successful Course Completion by Student Subpopulation



The engineering department was awarded \$1.2 million dollars by the NSF to help overcome this gap. This grant is part of a \$5 million grant in cooperation with Cal Poly and Hancock College. We are currently in year 2 of this grant called ENGAGE. Students receive up to \$7700/year for up to 5 years if they then transfer to Cal Poly. Students also receive intense strength training and mentoring. There are approximately 50 students at Cuesta who have been admitted into this program. Students are based on need, GPA, enrolled in CALC I or higher.

#### Other Relevant Program Data (optional)

Provide and comment on any other data that is relevant to your program such as state or national certification/licensure exam results, employment data, etc. If necessary, describe origin and/or data collection methods used.

#### IV. CURRICULUM REVIEW

List all courses and degrees/certificates that have been created, modified, or deactivated (and approved by the Curriculum Committee) since the last CPPR.

Complete the [Curriculum Review Template](#) and submit the form within your CPPR.

Attached.

Completing the template will provide evidence that the curriculum (including course delivery modalities) has been carefully reviewed during the past five years for currency in teaching practices, compliance with current policies, standards, regulations, and with advisory committee input. The form requires you to include evidence that the following entries on the course outline of record (CurricUNET format) are appropriate and complete:

- Course description
- Student learning outcomes
- Caps
- New DE addendum is complete
- MQDD is complete
- Pre-requisites/co-requisites
- Topics and scope
- Course objectives
- Alignment of topics and scopes, methods of evaluation, and assignments with objectives
- Alignment of SLOs and objectives with approved requirement rubrics (General Education, Diversity, Health, Liberal Arts)
- Textbooks
- CSU/IGETC transfer and AA GE information
- Degree and Certificate information

The template also includes a calendar of a five-year cycle during which all aspects of the course outline of record and program curriculum, including the list above, will be reviewed for currency, quality, and appropriate CurricUNET format.

Attached.

**V. PROGRAM OUTCOMES, ASSESSMENT AND IMPROVEMENTS**

Attach or insert the assessment calendar for your program for the next program review cycle.

CYCLE STAGE	Sp 2021	Fall 2021	Sp 2022	Fall 2022	Sp 2023
SLO Assessment	All Courses				
Analyze Results & Plan Improvements		All Courses			
Plan Implementation		All Courses			
Post-Implementation SLO Assessment		All Courses			

Have you completed all course assessments in eLumen? If no, explain why you were unable to do so during this program review cycle and what plan(s) exist for completing this in the next program review cycle.

Yes, up to date and we will start the cycle over this semester.

Include the most recent “PLO Summary Map by Course” from eLumen which shows the Course-level SLOs mapped to the Program-level SLOs.

See attached

Include the most recent “ILO Summary Map by Course” from eLumen that shows the Course-level SLOs mapped to the Institutional Learning Outcomes.

See attached

Highlight changes made at the course or program level that have resulted from SLO assessment. Please include the evidence of dialog that prompted these changes.

None were identified.

Identify and describe any budget or funding requests that are related to student learning outcome assessment results. If applicable, be sure to include requests in the [Resource Plan](#) Worksheet.

**VI. PROGRAM DEVELOPMENT**

Continue to work directly with the Dean and department chairs at Cal Poly so that Cuesta makes program changes as dictated by them and other 4-year schools. This proactive communication has allowed Cuesta to make changes in concert with them, rather than being reactive.

As with a trend across the school, FTES/FTEF rates have been decreasing due to the school’s need to chase FTE. This has allowed under filled courses not to be cancelled. In order to increase efficiency fewer sections were offered starting in Fall 2015. Rather than 3 sections of ENGR250, only 2 will be offered. We also have decrease the number of ENGR226 sections from 3 to 2 each semester so that each starts off above 100%.

Beginning Fall 2021 we will reduce the number of sections per semester from 2 to 1 for ENGR252A and ENGR252B.

Dual enrollment has continued to increase each year. Hopefully this will translate into additional students attending Cuesta in the future. Here is a list of number of SECTIONS of dual enrollment for 2020-2021, 15 sections total:

CLASS	NUMBER OF DUAL ENROLLED SECTIONS						
	AGHS	CUHS	MB	NTHS	PRHS	SLOHS	THS
ENGR200- Robotics		2					
ENGR205- Manufacturing							1
ENGR226- Engineering Drawing	2					1	
ENGR228- Solidworks						1	
ENGR248- Intro to Engineering		2		3	1		2

## VII. END NOTES

If applicable, you may attach additional documents or information, such as awards, grants, letters, samples, lists of students working in the field, etc.

NSF ENGAGE Grant \$1.2 Million, Jeff Jones, P.I.

I-USE NSF grant- Team members: Jeff Jones and Eltahry Elghandour

Foundation Grant 2019, 2020 for outreach. \$2000/ year

Partner with SLOCOE on a Manufacturing Apprenticeship Program, placing 32 students in local manufacturing jobs as follows:

### **2019 Cohort:**

How many started the program? 29 Students

How many completed the program? 22 Students

How many were placed? 17

What was the average starting pay? \$17.16

### **2020 Cohort:**

How many started the program? 30 Students

How many completed the program? 22 Students

How many were placed? 15

What was the average starting pay? \$18.93

### **Combined Precision Manufacturing Cohorts 2019-2020:**

How many started the program? 59 Students

How many completed the program? 44 Students

How many were placed? 32

What was the average starting pay? \$17.99

Other info:

2019 PM Cohort: 193 Leads that showed interest in the program (not counting the 29 individuals who became participants of the program)

2020 PM Cohort: 185 Leads (not counting the 30 individuals who became participants of the program)

**Top Employers:**

Trust Automation

Entegris

Mantis Composites

Rantec RPS Holdings

**VIII. After completing and submitting this document, please complete the [Overall Program Strength and Ongoing Viability Assessment](#) with your Dean before May 14, 2021.**



## SIGNATURE PAGE

Faculty, Director(s), Manager(s), and/or Staff Associated with the Program

**Instructional Programs: All full-time faculty in the program must sign this form. If needed, provide an extra signature line for each additional full-time faculty member in the program. If there is no full-time faculty associated with the program, then the part-time faculty in the program should sign. If applicable, please indicate lead faculty member for program after printing his/her name.**

**Instructional Programs: All full-time director(s), managers, faculty and/or classified staff in the program must sign this form. (More signature lines may be added as needed.)**

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Division Chair/Director Name	Signature	Date
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Name	Signature	Date
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Name	Signature	Date
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Name	Signature	Date
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## SUPPLEMENTAL DOCUMENTS

### FACULTY HIRING PRIORITIZATION INFORMATION (IF APPLICABLE)

If your program requested a faculty position for consideration, please attach or embed the following worksheets that were presented to the College Council. The guidelines for faculty prioritization can be found here:

[https://cuestacollege.sharepoint.com/Committees/College%20Council/Committee%20Documents/AY\\_2018\\_2019/meeting\\_09\\_11\\_2018/Prioritization\\_Process\\_Handbook\\_2018\\_Final\\_Sep04.pdf](https://cuestacollege.sharepoint.com/Committees/College%20Council/Committee%20Documents/AY_2018_2019/meeting_09_11_2018/Prioritization_Process_Handbook_2018_Final_Sep04.pdf)

#### APPLICABLE SIGNATURES:

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**Vice President/Dean**

**Date**

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**Division Chair/Director/Designee**

**Date**

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**Other (when applicable)**

**Date**

The above-signed individuals have read and discussed this review. The Director/Coordinator, Faculty, and staff in the program involved in the preparation of the CPPR acknowledge the receipt of a copy of the Vice President/Dean's narrative analysis. The signatures do not necessarily signify agreement.