

# 2018-2019 Program Review Cycle



## Instructional Programs

### CAN Program Review (Instructional) - Engineering (Odd Year)

#### Program Review Narratives

2018-2019

##### **Instructional Program Review (IPR)**

**Lead Contact Person:** n/a

**Writing Team:** Adam Windham

##### **Executive Summary**

**0. Executive Summary:** The Engineering Program has a solid foundation upon which to build. The program benefits from well-established articulation agreements with four-year engineering programs; strong collaborative relationships with other community colleges and transfer universities; strong connections with math, chemistry, physics, and computer science departments; and a strong track record of securing federal grant funding to develop and implement successful initiatives. Multiple grants directly support faculty and students in the engineering department, with another district-wide grant proposal currently in development.

The program is currently facing multiple significant challenges. The retirement of Dr. Amelito Enriquez and the recent resignation of Dr. Cheri Markt have left the department without any full-time faculty to lead it. Increased competition from our sister college's programs has also reduced enrollment. The program also continues to experience challenges recruiting women, with only 20% of the program participants identifying as female (compared to 60% of the college overall). However, the program has successfully improved access for Hispanic students (29.7% in 2017/18, above even the college-wide percentage of 28.6%), and has consistently maintained high student success and retention rates.

##### **Program Context**

**1. Mission:** Cañada College's Engineering program is a transfer program that offers the lower-division courses needed by students to transfer to four-year programs in any field of engineering. The mission of the program is to educate students from a diverse population to become productive members of the engineering professions and society at large. The department combines excellence in teaching theoretical principles and concepts with practical hands-on experience and the development of technical proficiency and communications skills. The departments work closely with the College's Mathematics, Physics, Computer Science, and Chemistry departments, as well as the College's Student Services Division and four-year engineering programs to maximize students' opportunity for timely completion of courses and successful transfer. Although primarily transfer programs, courses are also available for students who are seeking to update job skills related to engineering. Engineering students receive academic support services and professional development opportunities from the College's STEM Center (including the Mathematics, Engineering, and Science Achievement (MESA) Program).

**2. Articulation:** no known changes

**3. Community & Labor Needs:** The demand for engineering courses has been affected by the recent expansion of Skyline College's Engineering Program. We are working with both Skyline and CSM on course offerings in order to best serve our students while ensuring healthy enrollments in engineering courses in the three colleges.

##### **Looking Back**

**4. Curricular Changes:** ENGR 215 was updated to better match C-ID requirements. Evening and online course offerings have been scaled back due to low enrollment and restricted instructor availability.

**5A. Progress Report - IPC Feedback:** It was recommended that more data be collected on the state of the local industry. This information was unfortunately not available at the time of this review, but can be collected through collaboration with the new Workforce Director. It was also requested that more local opportunities for collaboration be explored: the division is currently pursuing a preparation grant to expand our internship opportunities for students to new institutions, including engineering.

**5B. Progress Report - Prior Action Plans:** For the last review there were five action plans identified, four ongoing and one new:

\* Continue collaborating with four-year universities regarding curriculum (ongoing)

For engineering this is accomplished through the Engineering Liaison Council. This is an on-going effort through the submission of courses to the state-wide C-ID system and through faculty involvement in ELC. Without full-time faculty to represent the college at ELC, this action plan is on hold.

\* Actively promote academic and student support services among engineering and CIS students; work with STEM Center staff, including the MESA Director (ongoing).

This is also an on-going effort through engineering faculty involvement in STEM Center activities. No meaningful progress on this objective can be made without a full-time faculty member in the department.

\* Develop and implement online curriculum for engineering lab courses Engr 100, Engr 210, Engr 261, and Engr 270 (ongoing). All of the above courses have been approved by the local curriculum committee for fully-online delivery, except for ENGR 261. Implementation of fully-online coursework has been stalled, however, due to inexperience with online delivery on the part of faculty. New faculty with experience and interest in online instruction will be necessary to make progress on this goal.

\* Continue to pursue external funds to develop new programs and expand successful existing programs (ongoing). The retirement of faculty with extensive grant experience (Dr. Enriquez) makes this goal unrealistic for the department at this time. Funding support for expanded programs will fall to the division or college as a whole, and can no longer be supported by this department on its own.

\* Close the equity gap for female students (new for the last review cycle).

Only slight progress has been made in reducing the equity gap for female student access (from 42.5% in the previous cycle to 40.4% in the current cycle). The program will continue to benefit from division-wide initiatives that promote women in STEM, such as the Women in STEM Community of Practice, the Women in STEM Student Community, and the STEM Speaker Series highlighting women in STEM careers. Direct benefit of these initiatives to the engineering program will be limited without a full-time faculty member to incorporate them, and other aspects of the action plan - such as updated pedagogical practices to make courses more accessible to women and under-represented minorities - will have to effectively be put on hold.

**6A. Impact of Resource Applications:** Prior resource requests were for software licenses that were necessary to meet the course objectives for courses that require them. No measurable effects on student success were expected or observed.

**6B. Impact of Staffing Changes:** The impact of the loss of all full-time faculty from this department cannot be overstated. The loss of Dr. Amelito Enriquez, though anticipated, has still resulted in a loss of considerable experience and connections involving grant funding to support the department and related programs. The loss of Dr. Cheri Markt through an unexpected resignation in the following month, however, has now left the department without any full-time faculty at all. Progress on any significant program goals will be nearly impossible until this position is re-staffed.

### **Current State of the Program**

**7. Enrollment Trends:** Compared to enrollment at the end of the last review cycle (282 students for the 2015/16 academic year), student enrollment actually rose slightly the following year (300 students for the 2016/17 academic year), then dropped precipitously for the following year (222 students for 2017/18), a net loss of 21% over the two-year period. This has resulted in commensurate decreases in FTES and load for the department.

This is likely due to a number of factors, including declining enrollment at the college as a whole and increased competition for engineering students in the area. (Skyline College is continuing to expand their engineering program, which may be drawing these students away from Canada.) The most significant factor appears to be the loss of distance education students: the program had traditionally offered two sections of online coursework every semester, but this was reduced to one section in Fall 2017, with no courses being offered online in Spring 2018 or later. The loss of these online students (approximately 50-80 per year) can almost completely account for the enrollment decline in the program over the last cycle. If online coursework were to be reincorporated into the program, these trends might be reversed.

**8-A. Access & Completion:** The groups identified as experiencing access gaps are female students (with a 40.4% access gap) and white students (with a 4.4% gap). Access to engineering for women continues to be an important goal for the program, and for the division as whole. Multiple grant-funded initiatives are currently underway to help close this gap. (See Section 5.B for a discussion of this ongoing action plan.) The access gap for white students is far smaller, and is a continued indication of the gender access gap: white male students are still over-represented in the program (17.2% of engineering students, compared to 9.1% of the college), though white female students are greatly under-represented (2.8% of engineering vs. 15.4% college-wide). The only group identified as having a success gap is Filipino students, with a 6.1% equity gap (75.0% completion rate for Filipino students vs. 81.1% completion rate for all of engineering). This is not a cause of concern at this time, as this amounts to the difference of a single student, and shows success rates for Filipino students are still program targets. Future program review will need to watch this figure to look for trends, however.

**8-B. Completion - Success Online:** Success rates in online courses continue to lag behind face-to-face course success rates, but by a reduced margin. Over the last two years, success rates for online courses has risen to 75.2% (up from 71.7% in 2015/16), and retention rates have risen to 87.6% (up from 76.7%). These rates are still below face-to-face success and retention rates (87.1% and 93.1% respectively for the same two-year period), but are above department goals and college averages. Unfortunately, it is unclear if these success rates will continue in the future: online courses have not been scheduled in this department since Spring 2017, and the faculty trained in effective online pedagogy have left the program. New faculty will need to possess or be provided experience in distance education if these successes are to continue in the future.

**9A. SLO Assessment - Compliance:** All active courses have assessment methods and results entered into TracDat. In the absence of a full-time faculty member to oversee assessment for the program, the division dean is coordinating with substitute faculty to ensure that all courses will have up-to-date SLO data by the end of this academic year. The full-time faculty had not developed a

three-year plan for SLO assessment before they left the college, so this will be developed in coordination with the dean in their absence, to be revised by any full-time faculty replacement that joins the department.

**9B. SLO Assessment - Impact:** In the absence of full-time faculty in the department, no meaningful dialogue regarding SLO assessment can take place.

**10. PLO Assessment:** Six Program Learning Outcomes have been identified for the program on the department website. It is not clear how their assessment has been entered into TracDat; according to the previous program review, direct assessments have been performed for all PLOs for the program, but these results are not visible to the current writing team. The division dean will work with the college's technology and assessment team to find a record of these assessments, and ensure that PLO assessment continues and informs the trajectory of the department.

### **Looking Ahead**

**11. Program Planning:** 1) Hire a full-time faculty member in engineering

Few other meaningful action plans can be implemented without a full-time faculty member to lead this department. Prior action plans (collaboration with four-year institutions, promotion of support services for engineering students, and implementation of pedagogical practices to close the access gap for female students) will require faculty involvement to be successful.

2) Reintroduce online course offerings

Identify courses that would satisfy student demand if offered in an online environment, and faculty highly-qualified to teach them, to recapture a student population lost to reduction in online course offerings.

3) Develop a three-year SLO assessment plan

Develop a three-year SLO assessment plan, in coordination with division dean and adjunct faculty in the department.

**Program Review Narrative Status:** Complete

## **Objective: Hire a full-time faculty member in engineering**

Few other meaningful action plans can be implemented without a full-time faculty member to lead this department. Prior action plans (collaboration with four-year institutions, promotion of support services for engineering students, and implementation of pedagogical practices to close the access gap for female students) will require faculty involvement to be successful.

**Objective Status:** 1 - New (PR)

**Objective Year:** 2019-2020

**Estimated Start Date:** 01/01/2019

**Estimated Completion Date:** 05/31/2019

**Please select the college goals with which this objective aligns.:** Student Completion/Success - Provide educational and student services programs that highlight inclusivity, diversity, and equity in their mission to help students meet their unique educational goals and minimize logistical and financial barriers to success., Community Connections - Build and strengthen collaborative relationships and partnerships that support the needs of, reflect, and enrich our diverse and vibrant local community., Organizational Development - Focus institutional resources on the structures, processes, and practices that invest in a diverse student population and prioritize and promote equitable, inclusive, and transformative learning.

**Please select the district goals with which this objective aligns.:** District Goal #1 - Develop and Strengthen Educational Offerings, Interventions, and Support Programs that Increase Student Access & Success, District Goal #2 - Establish And Expand Relationships With School Districts, 4-year College Partners, And Community-based Organizations To Increase Higher Education Attainment In San Mateo County, District Goal #3 - Increase Program Delivery Options, Including the Expanded Use of Instructional Technology, to Support Student Learning and Success, District Goal #4 - Ensure Necessary Resources Are Available To Implement This Strategic Plan Through Sound Fiscal Planning And Management Of Allocations. Protect Community-supported Status And Undertake The Development Of Innovative Sources Of Revenue That Support Educational Programs Beyond That Which Is Available From Community And State Allocations.

### **Action Plans**

**2018-2019** - Complete process for obtaining approval for a new full-time faculty hire in engineering, to begin in the Fall 2019 semester. (Active)

**Who's Responsible for Completing this Action Plan?:** Adam Windham

**Estimated Completion Date:** 05/31/2019

## **Objective: Reintroduce online course offerings**

# CAN Program Review (Instructional) - Engineering (Odd Year)

Identify courses that would satisfy student demand if offered in an online environment, and faculty highly-qualified to teach them, to recapture a student population lost to reduction in online course offerings.

**Objective Status:** 2 - Continuing (PR)

**Objective Year:** 2019-2020

**Estimated Start Date:** 01/01/2019

**Estimated Completion Date:** 12/31/2019

**Please select the college goals with which this objective aligns.:** Student Completion/Success - Provide educational and student services programs that highlight inclusivity, diversity, and equity in their mission to help students meet their unique educational goals and minimize logistical and financial barriers to success., Organizational Development - Focus institutional resources on the structures, processes, and practices that invest in a diverse student population and prioritize and promote equitable, inclusive, and transformative learning.

**Please select the district goals with which this objective aligns.:** District Goal #1 - Develop and Strengthen Educational Offerings, Interventions, and Support Programs that Increase Student Access & Success, District Goal #3 - Increase Program Delivery Options, Including the Expanded Use of Instructional Technology, to Support Student Learning and Success

## Action Plans

**2018-2019** - Review prior online course offerings and enrollment patterns, to determine which courses are most eligible for online delivery. Consult with sister colleges to ensure complementary course offerings that will reduce competing overlap. Consult with faculty to identify qualified instructors for those courses, and then begin scheduling them no later than the Fall 2019 semester. (Active)

**Who's Responsible for Completing this Action Plan?:** Adam Windham

**Estimated Completion Date:** 03/31/2019

## Objective: Develop a three-year SLO assessment plan

Develop a three-year SLO assessment plan, in coordination with division dean and adjunct faculty in the department.

**Objective Status:** 1 - New (PR)

**Objective Year:** 2019-2020

**Estimated Start Date:** 11/16/2018

**Estimated Completion Date:** 12/14/2018

**Please select the college goals with which this objective aligns.:** Organizational Development - Focus institutional resources on the structures, processes, and practices that invest in a diverse student population and prioritize and promote equitable, inclusive, and transformative learning.

**Please select the district goals with which this objective aligns.:** District Goal #1 - Develop and Strengthen Educational Offerings, Interventions, and Support Programs that Increase Student Access & Success

## Action Plans

**2018-2019** - Develop a three-year SLO assessment plan, based on course offering patterns. (Active)

**Who's Responsible for Completing this Action Plan?:** Adam Windham

**Estimated Completion Date:** 12/14/2018