

# Search Standards By User

Source: IPR

Cycle: Instructional Program Review 2016-17

User Name: Lead Faculty, Engineering and CS

Response Types: All Responses Types

1	<b>Executive Summary</b>
0	Executive Summary

Summarize your program's strengths, opportunities, challenges, and action plans. This information will be presented to the Board of Trustees. [1000 word limit]

## Response Detail

No Response Information to Display

## Narrative

The Engineering Program continues to be one of the strongest programs in the college. Among the strengths of the program are: 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; faculty that has been a leader in engineering education both in the regional and national levels; and a strong track record of securing federal grant funding to develop and implement successful initiatives. Currently, there are five grant-funded programs that are directly supporting faculty and students in the engineering department. Three of these programs are ending in the next year, and it is important that the department continues to pursue these opportunities in order to continue to strengthen the program.

Among the challenges that the department faces is increasing competition for students, which may result in decreased enrollment. With Skyline College recently hiring a new full-time engineering instructor, and CSM hiring a new full-time engineering faculty to start in Fall 2017, it is important that the engineering departments in the three colleges in the District coordinate in building the schedule of course offerings in order to best serve students in the District while maintaining healthy enrollments in each course offered at each college. A continuing challenge for the department is addressing equity issues, with underrepresented minorities (particularly Hispanic and female students) continuing to be underrepresented in the program. Although slow progress has been achieved over the years (both locally and nationally), efforts to address this issue need to be continued. Two new grant initiatives have started this academic year in support of these efforts, a three-year Minority Science and Engineering Improvement Program (MSEIP) grant and a five-year HSI STEM and Articulation grant.

## Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display

2	<b>Program Context</b>
1	Mission

Identify how your program aligns with the college's mission by stating which categories of courses you offer: Career Technical, Basic Skills, Transfer, and/or Lifelong Learning. If your program has a mission statement, you may include it here.

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## Narrative

**Career Technical Basic Skills Transfer Lifelong Learning**

### Mission statement:

Cañada College's Engineering and CIS programs are transfer programs that offer the lower-division courses needed by students to transfer to four-year computer science programs or engineering programs in any field of engineering. The mission of the two programs is to educate students from a diverse population to become productive members of the engineering/computer science professions and society at large. Each 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, and Chemistry departments, as well as the College's Student Services Division and four-year engineering and computer science 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 and computer science. Engineering and computer science students receive academic support services and professional development opportunities from the College's STEM Center (including the Mathematics, Engineering, and Science Achievement (MESA) Program).

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No Suggested Follow Ups to Display

2      Articulation

Are there changes in curriculum or degree requirements at high schools or 4-year institutions that may impact your program? If so, describe the changes and your efforts to accommodate them. If no changes have occurred, please write "no known changes".

## Response Detail

No Response Information to Display

## Narrative

Changes in high school curriculum have minimal effect on our curriculum. Changes in the curriculum at four-year institutions are reflected in our curriculum. We are in on-going conversations with university faculty in computer science and engineering regarding the lower-division curriculum and requirements for transfer. We recently received articulation with the C-ID system for the following courses: ENGR 111, ENGR 210, and ENGR 270. Conditional approval was received for ENGR 230, ENGR 240, and ENGR 261. ENGR 260 was not approved. Course modifications have been submitted to the Curriculum for ENGR 260 and ENGR 261; proposed modifications for ENGR 230 and ENGR 240 will be submitted this semester.

## Suggested Follow Ups

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No Suggested Follow Ups to Display

3      Community and Labor Needs

Are there changes in community needs, employment needs, technology, licensing, or accreditation that may affect your program?. If so, describe these changes and your efforts to accommodate them. If no changes have occurred, please write "no known changes". CTE programs: identify the dates of your most recent advisory group meeting and describe your advisory group's recommendations for your program.

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## Narrative

We are addressing community needs by offering day courses for full-time students and evening courses for working students. 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.

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No Suggested Follow Ups to Display

3 Looking Back

4 Curricular Changes

List any significant changes that have occurred over the prior two years in your program's curricular offerings, scheduling, or mode of delivery. Explain the rationale for these changes.

## Response Detail

No Response Information to Display

## Narrative

Changes in the engineering curriculum are in direct response to the recently approved statewide C-IDs. These changes are: increase in the number of units for Engr 270 from 3 to 4, adding Math 251 as a prerequisite for Engr 215, and adding Engr 230 as a prerequisite for Engr 240. Prerequisites for Engr 260 and ENGR 261 have been changed (concurrent or prior completion of Math 275) to satisfy the requirements of the C-ID and make the prerequisites uniform in the three colleges in the district.

Prerequisites for Engr 230 will also be changed to include Math 252 as a response to the C-ID requirements. There have been no changes in the CIS curriculum this academic year, due to the fact that the CIS curriculum is part of the new Computer Science Degree and it is up to date.

## Suggested Follow Ups

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No Suggested Follow Ups to Display

5.A. Progress Report - IPC Feedback

Provide your responses to all recommendations received in your last program review cycle.

## Response Detail

No Response Information to Display

## Narrative

There were no recommendations from the the reviewers of the last program review for CIS and Engineering.

## Suggested Follow Ups

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5.B. Progress Report - Prior Action Plans

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Provide a summary of the progress you have made on the strategic action plans identified in your last program review.

## Response Detail

No Response Information to Display

## Narrative

There were 6 action plans identified in the last program review. The progress in achieving each plan is summarized below. Hire a new tenure-track Engineering/CIS full-time faculty. This has been achieved; Professor Cheri Markt was hired in Spring 2016

Continue collaborating with four-year university regarding curriculum. For engineering this will be 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. Both Professor Enriquez and Professor Markt attend the ELC meeting.

Actively promote academic and student support services among engineering and CIS students; work with STEM Center staff, including the MESA Director. This is also an on-going effort through CIS and Engineering faculty involvement in STEM Center activities.

Pilot e-Portfolios in engineering courses. This was piloted by Professor Enriquez in Engineering Graphics. The campus effort in using e-Portfolios for direct assessment of Program Learning Outcomes seems to have dissipated. There are no plans to expand this to other courses.

Develop and implement online curriculum for engineering lab courses Engr 100, Engr 210, Engr 261, and Engr 270. This is an ongoing effort through a grant sponsored by the National Science Foundation Improving Undergraduate STEM Education (NSF IUSE) program. Curricula for these online lab classes have been developed and are being piloted at partner institutions Canada College, Skyline College, College of Marin, and Monterey Peninsula College.

Continue to pursue external funds to develop new programs and expand successful existing programs. Since the most recent program review, two new federal grants have been received -- a \$900,000 Minority Science and Engineering Improvement Program grant from the US Department of Education (10/01/2015-9/30/18) and a \$435,000 HSI STEM Grant also from the US Department of Education (10/01/16-9/30/21).

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### 6.A. Impact of Resource Allocations

Describe the impact to-date that new resources (equipment, facilities, research) requested in prior years' program reviews have had on your program. If measurable impacts on student success have been observed, be sure to describe these and include any documentation/evidence. If no resources have been recently requested, please write ?not applicable?.

## Response Detail

No Response Information to Display

## Narrative

Programs developed through grant-funded programs including Math Jam, Physics Jam, tutoring, and Supplemental Instruction have significantly increased enrollment not only in engineering and CIS but in other STEM areas as well. These programs have also led to improved student performance and increased student engagement in academic and professional development activities such as internships, workshops, seminars, conferences, and student clubs.

Since the most recent program review, two new federal grants have been received -- a \$900,000 Minority Science and Engineering Improvement Program grant from the US Department of Education (10/01/2015-9/30/18) and a \$435,000 HSI STEM Grant also from the US Department of Education (10/01/16-9/30/21). These new grant initiatives will expand on services, activities, and support for engineering and CIS students.

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## 6.B. Impact of Staffing Changes

Describe the impact on your program of any changes in staffing levels (for example, the addition, loss or reassignment of faculty/staff). If no changes have occurred, please write "not applicable".

### Response Detail

No Response Information to Display

### Narrative

The recent hiring of a new full-time engineering instructor has drastically reduced the need for adjunct faculty in engineering. For the next few years, adjunct faculty will be needed for only a couple of courses (ENGR 111 and ENGR 215).

### Suggested Follow Ups

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No Suggested Follow Ups to Display

## 4 Current State of the Program

### 7 Enrollment Trends

Use the Productivity data packet to examine your enrollments (headcount, FTES, Load) and pattern of course offerings (Productivity by Courses by Semester). How have your enrollments changed? What changes could be implemented, including changes to course scheduling (times/days/duration/delivery mode/number of sections), marketing, and articulation of pathways that might improve these trends? NOTE: If other sources of data are used, please upload these documents or provide URLs.

### Response Detail

No Response Information to Display

### Narrative

The headcount decreased from 329 to 282 from the 2014-2015 academic year to the 2015-2016 academic year, a 14.3% decrease. Because of this decrease in enrollment, the corresponding FTES, WCSH, and load also decreased. This significant decrease in enrollment may be attributed to a number of factors including decrease in enrollment college-wide, increasing interest in computer science (which can draw students away from engineering), and increasing competition for students in the area, particularly in engineering. The most significant factor affecting engineering enrollment at Canada College is the fact that Skyline College, which is one of the three community colleges in the District, recently started an engineering program and hired a full-time engineering instructor in Spring 2016. Enrollment trends at Canada and Skyline need to be monitored in the next few semesters to determine the extent that Skyline's new engineering program negatively affects enrollments at Canada.

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## 8-A. Access & Completion

One of the goals of the College's Student Equity plan is to close the performance gaps for disproportionately impacted students. The Equity Supplement data packet indicates which groups are experiencing disproportionate impact in your program. Which gaps are most important for improving outcomes in your program? How can the college help you address these gaps? What changes could be made?

### Response Detail

No Response Information to Display

### Narrative

For the past five academic years, both the success and retention rates for engineering courses are above the overall rate goals. For 2015-2016, the department success rate of 81.2% is significantly higher than the success rate goal of 70%; the department retention rate of 86.5% is higher than the retention rate goal of 84%.

In terms of equity on access to engineering, female students are significantly underrepresented in the department, with only 19.3% access rate, compared to the overall college access rate of 61.8% for female students. Although this represents a very significant inequity for female students, this is a national trend as evidenced by the fact that the only 18-20% of engineering students are women. To address this issue, the two new MSEIP (Minority Science and Engineering Improvement Program) grant from the US Department of Education have been designed to increase the number and improve the academic performance of female students in STEM fields. The ASPIRES (Accelerated STEM Pathways through Internships, Research, Engagement, and Support) collaborates with LISTAS (Latinas in STEM To Achieve Success) to host the annual conference at Canada to increase awareness of STEM fields among K12 female students and their parents. The INSPIRES (Implementing New Strategies and Programs for Improving Retention and Enhancing Success) grant is developing a STEM faculty development program that includes strategies and activities that aim to increase the interest and success of female students in STEM.

In terms of equity on success, Hispanic and White students have success rates that are below the department average. The success rate for Hispanic students is 74.1% and the success rate for White students is 76.2%. Although these rates are above the success rate goal of 70%, they are slightly lower than the overall department of 81.2%. To improve the success of all engineering students, especially those from underrepresented backgrounds, a number of grant-funded initiatives are being developed implemented through the two MSEIP grants mentioned above and the new HSI STEM grant funded by the US Department of Education. Among these initiatives are: Difference Education Intervention, EPIC (Embedded Peer Instruction Cohort, which is a modified Supplemental Instruction program), STEM faculty professional development program, STEM Community of Practice, and a three-tier research internship program for engineering students.

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No Suggested Follow Ups to Display

## 8-B. Completion - Success Online

The college has a goal of improving success in online courses. Examine the "Course Success and Retention by DE vs Non DE" data table in the "Effectiveness: Success and Retention" data packet. What significant gaps do you see in success between online/hybrid and non-online courses? What changes could be made to reduce these gaps? If your program does not offer online/hybrid courses, please write "not applicable".

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## Response Detail

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## Narrative

Online delivery is increasingly becoming a significant portion of the department's offering. For the 2015-2016 academic year, 24.1% of the total student headcount comes from online/hybrid sections. The success and retention rates for online courses in engineering are lower than the face-to-faces courses (71.7% vs. 83.5% for success rates, and 76.7% vs. 89.0% for retention rates). However, the success rate for online engineering courses (71.7%) is significantly higher than the overall success rate for all online courses in the college (61.9%). The need to improve student outcomes for online courses is being addressed to a grant-funded project titled Creating Alternative Learning Strategies for Transfer Engineering Programs (CALSTEP), which is funded by the National Science Foundation. CALSTEP is developing teaching and learning strategies and resources for online engineering courses and trains engineering faculty on the effective use of these strategies and resources through the Summer Engineering Teaching Institute (SETI) held at Cañada College.

## Suggested Follow Ups

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No Suggested Follow Ups to Display

9.A. SLO Assessment - Compliance

Are all active courses being systematically assessed over a 3-year cycle? Describe the coordination of SLO assessment across sections and over time.

## Response Detail

No Response Information to Display

## Narrative

Course-level student learning outcomes and department-level learning outcomes for engineering courses have been assessed regularly. Most of the course-level SLO assessment results have been satisfactory. A total of 243 individual course SLO assessment results have been reported in Tracdat, and less than 5% of these results did not meet the criterion. Course level SLO assessments that have yielded unsatisfactory results have been used to make changes in specific courses (length, depth and order of coverage of topics; methods of delivering content and assessing student learning, etc.). One course lacking SLO assessment results is ENGR 111. This course is only offered every fall semester of odd years, and has been taught by an adjunct instructor who only teaches this class every two years, and only comes to campus every Friday when he is teaching the course. As a result, it has been difficult to get this instructor engaged in the SLO efforts of the department.

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9.B. SLO Assessment - Impact

Summarize the dialogue that has resulted from these course SLO assessments. What specific strategies have you implemented, or plan to implement, based upon the results of your SLO assessment? Cite specific examples.

## Response Detail

No Response Information to Display

## Narrative

For engineering courses, results of SLO assessments in minor changes in the courses including changes in the order in which topics are covered, amount of time spent on specific topics, and additional formative assessments (e.g., quizzes) on topics that proved difficult for students.

## Suggested Follow Ups

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No Suggested Follow Ups to Display

10 PLO Assessment

Describe your program's Program Learning Outcomes assessment plan. Summarize the major findings of your PLO assessments. What are some improvements that have been, or can be, implemented as a result of PLO assessment?

## Response Detail

No Response Information to Display

## Narrative

For Engineering, all five active PLOs have been assessed at least once. A total of 12 direct assessments of the PLOs have been reported and uploaded in Tracdact. All assessments showed satisfactory achievement of success criteria.

## Suggested Follow Ups

Date	Suggested Follow Up
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No Suggested Follow Ups to Display