

Engr_PR_F2022

Cover

Overview

Title Engr_PR_F2022

Year of Last Comprehensive Review Fall 2016

Year of Last Mini Update, if applicable

Originator Tabrizi, Abdollah

Area Dean Antoinette Herrera

Division

Math, Sci. & Engineering

Department

Engineering

Subject

- ENGR - Engineering

Is this a review for a degree/certificate or all the courses in the subject?

All Courses

Courses with no Degree or Certification

- ENGR 001 - Technology and Society - Historical
- ENGR 001 - Technology and Society - Historical
- ENGR 001 - Technology and Society - Historical
- ENGR 060 - Surveying - Active
- ENGR 060 - Surveying - Historical
- ENGR 060 - Surveying - Historical
- ENGR 060 - Surveying - Historical
- ENGR 061 - Plane Surveying - Historical
- ENGR 061 - Plane Surveying - Active
- ENGR 062 - Route Surveying, Curves and Earthwork - Historical
- ENGR 063 - GIS for Civil Engineering and Surveying - Historical
- ENGR 063 - GIS for Civil Engineering and Surveying - Historical
- ENGR 063 - GIS for Civil Engineering and Surveying - Active
- ENGR 098 - Directed Study in Engineering - Historical
- ENGR 136 - Engineering Occupational Work Experience-Parallel Plan - Historical
- ENGR 137 - Special Topics in Engineering - Historical
- ENGR 138 - Occupational Work Experience - Historical
- ENGR 200 - Engineering Supervised Lab - Historical
- ENGR 210 - Engineering Supervised Tutoring - Historical
- ENGR 500 - Introduction to Engineering - Historical

- ENGR 500 - Introduction to Engineering - Historical
- ENGR 500 - Introduction to Engineering - Historical
- ENGR 500 - Introduction to Engineering - Active
- ENGR 502 - Basic Math Applications in Engineering - Historical
- ENGR 502 - Basic Math Applications in Engineering - Historical
- ENGR 502 - Basic Math Applications in Engineering - Historical
- ENGR 502 - Basic Math Applications in Engineering - Historical
- ENGR 502 - Basic Math Applications in Engineering - Historical
- ENGR 502 - Basic Math Applications in Engineering - Historical
- ENGR 504 - Technical and Contextualized Communication in Engineering - Historical
- ENGR 504 - Technical and Contextualized Communication - Historical
- ENGR 504 - Technical and Contextualized Communication in Engineering - Historical
- ENGR 504 - Technical and Contextualized Communication in Engineering - Historical
- ENGR 504 - Technical and Contextualized Communication in Engineering - Historical
- ENGR 506 - Basic Principles of Engineering - Historical
- ENGR 506 - Basic Principles of Engineering - Historical
- ENGR 506 - Basic Principles of Engineering - Historical

Co-Contributors

*Co-Contributor must be chosen before proposal is launched

- Herrera, Antoinette

Overview

Evergreen Valley College guides all students to pathways that reach their educational and career goals through equity-centered, innovative academic programs and support services. By creating a learning environment where everyone feels welcomed and supported, we are committed to a culture of inquiry, growth, and respect that creates an equitable society in which all can participate and prosper.

1.Student-Centered: We provide access to quality and efficient programs and services to ensure student success.

- **Access**
- **Curriculum and programs**
- **Services**

2. Community Engagement: We will transform the college image and enhance partnerships with community, business and educational institutions.

Areas of focus are:

- **Increase visibility**
- **Develop strategic partnerships**
- **Building campus community**

3.Organizational Transformation: We create a trusting environment where everyone is valued and empowered.

Areas of focus are:

- **Communication**
- **Employee development**
- **Transparent Infrastructure**

Related Assessments

- Engr 1 SLO
 - SLO#2 Engr 001
 - SLO#2 Engr1
 - Engr. SLO Assessment2021
 - SLO Engr 18
 - SLO Engr 60
 - Engr. SLO Assessment2021
 - SLO E66
 - Engr. 500 SLO Assessment2022
 - SLO E500
 - SLO #2 Engr 500
 - SLO #3 Engr 500
 - SLO E500
 - Engr. PLO Assessment 2022
- 1. Provide a brief summary of your program. Please include a brief history and discuss any factors that been important to the program's development.**

The associate degree programs in engineering have been in existence for over 45 years at Evergreen Valley College (EVC). The program offers a lower-division curriculum for engineering education. The comprehensive two-year program offers an associate in science and arts degree. The engineering program enables the students to pursue the following paths:

1. Transfer to four-year universities, such as the University of California system, California State Universities, or independent private schools, and pursue bachelor's degrees in engineering.
2. Seek a technical job in the industry as a technician or engineering assistant.

Guided by the College's Commitments to Action focusing on Student Centeredness, Community Engagement, and Organizational Transformation, the engineering program has established partnerships with local high schools, organizations, and industry. The program has been continuously updated with state-of-the-art equipment and laboratories. All efforts have been made to maintain the currency of the curriculum, which will broaden students' access and success whether they transfer or seek employment after graduation. EVC's engineering program is the most comprehensive engineering program among the Bay Area community colleges and receives students from all the surrounding colleges due to the availability of modern, comprehensive labs, and curriculum.

The target students for this program are both high school graduates as well as retraining professionals. The program provides a low-cost and accessible alternative to university training. Engineering education at universities is impacted and quite often students have to move away from the area to enroll at universities. The engineering program at EVC provides an opportunity for local students to pursue their education without having to move away from the area and, once they complete their lower-division courses, they are ready to transfer to any institution, including San Jose State University.

The engineering program at EVC, as well as other colleges, emphasizes hands-on learning. The ABET (Accreditation Board for Engineering and Technology) requires hands-on design skills from engineering graduates. All courses are designed to meet the ABET's requirement, which is also required by the transfer institutions. In compliance with this requirement, the engineering program continually updates the curriculum as well as the laboratory experiments through the acquisition of equipment and support services. Students are given up-to-date information on curriculum and technology to help them succeed in their careers as well as education when they transfer to universities.

Critical thinking skills are a major part of engineering education and are required by ABET. Students gain and practice this skill through problem-solving, design, laboratory experimentation, and report writing. Environmental and social awareness is another attribute of an ethical engineer which is instilled in the students throughout their program. Students are given opportunities to analyze critical issues using supporting evidence and to formulate their thoughts regarding the social and environmental impact of engineering designs.

The engineering program enjoys student enrollment from local high schools and other neighboring colleges due to its comprehensive offerings.

The engineering program offers and emphasizes hands-on experience to all enrolled students through design, fabrication, and experimentation. The laboratory facilities include

- Properties of Materials lab
- Electrical/Electronic Lab
- Computer/Computational lab
- CADD lab
- Prototype shop

- 3Dprinting facility

The courses within the program are updated continually to reflect changes in the industry as well as the requirements of the transfer institutions. Student learning outcomes (SLOs) for all courses have been established and assessed. The students have met all the minimum requirements of the SLOs. Through the assessment result, some changes have been made to the coverage of the subject matters to improve the success of the students. For example, in Engineering 010 “Engineering Processes and Tools” more time is allocated to the design process and documentation. In Engineering 050 “Introduction to Computing,” additional laboratory examples and practices were included to master the concepts of loops and the use of if-else structure in programming. In Engineering 066, “Properties of Materials” included an extended experiment in cold-working, fatigue, and corrosion to help in the understanding of changes in the crystal structure. All course-level SLOs have been successfully assessed.

The engineering program defines its effectiveness in the following ways.

- **Increased student retention & success** – Retaining students is the program’s main goal; success is realized through retention. To increase retention, many hands-on activities have been incorporated into each course. Many new technologies have been added to attract students’ attention and curiosity. Success is enhanced by introducing students to the latest information and also providing timely and appropriate guidance.
- **Involvement of students** – The best way of assessing effectiveness is to observe student involvement and also listen to the students’ comments. Many changes are made as a result of students’ comments, which include helping with homework, helping with lab experiments, making material available through the course management system (Canvas), and many others.

The changes made in the above evaluations help the engineering program to a) stay current, b) increase enrollment, and c) produce qualified graduates.

The engineering program faces the following challenges to maintain and improve its effectiveness:

- The majority of the students are first-generation college students and are from low-income families. Many of the students work part-time and some full-time! This impacts their retention rates.
- There is a language barrier for over 50% of the students.
- The lack of prior preparation in math and sciences at the high school level.

All efforts are made to help students to succeed. Since this is a transfer program, our students must be adequately prepared to compete with their colleagues at the universities. Virtually all of our students transfer to four-year schools.

Since the last program review, the department has

- Added an evening section of Engr. 010
- Added a STEM section of Engr. 18
- Offered two cycles of the non-credit courses (Engr. 500, 502, 504, 506) to students from the adult education system in San Jose. However, starting Fall 2023, only Engr. 500 will be available due to the lack of interest.
- Added a few mechatronics labs in Engr. 10.
- Created two certificates in Robotics. However, due to the lack of facilities, equipment, and faculty, these certificates have not been offered.

- **2. Please provide an update on the program's progress in achieving the goals (3 years) set during the last comprehensive program review.**

The following goals have been achieved since the last program review:

1. All course-level SLOs have been assessed and reported, thus closing the loop!
2. All SLOs have been mapped to the ILOs.
3. All PLOs have been mapped to course-level SLOs.
4. All PLOs have been assessed and reported.
5. Added an evening section of Engr. 010
6. Added a STEM section of Engr. 18
7. Offered two cycles of the non-credit courses (Engr. 500, 502, 504, 506) to students from the adult education system in San Jose. However, starting Fall 2023, only Engr. 500 will be available due to the lack of interest.
8. Added three new mechatronics labs in Engr. 10.
9. Created two certificates in Robotics. However, due to the lack of facilities, equipment, and faculty, these certificates have not been offered.
10. Created an online version of Engr. 50 and 69.
11. Created a hybrid version of Engr. 18.
12. Created an online version of Engr. 001.
13. Deactivated Engr. 60, 61, and 63. These were part of the Surveying & Geomatics program which has been deactivated.
14. Redesigned the electrical/electronics lab and purchased new equipment.
15. Created a new corrosion lab in Engr. 66.
16. Purchased a new torsion tester for Engr. 66 lab.
17. Designed and fabricated solar energy experiment apparatus for the Engr. 10 lab.
18. Represent community colleges on the Mechanical Engineering Advisory Board at San Jose State.

- **3. Please state and recent accomplishments for your program and show how it contribute to the College's mission and success.**

The list of accomplishments is given in the last section. All of these directly tie to the EVC's mission. The overarching mission is

1. Provide access - low cost compared to university-level costs. A full complement of courses with comprehensive laboratory experience is offered. Students could complete their lower-division courses toward a bachelorette degree in engineering.
2. Student-centered program to help students succeed. There is a certain level of flexibility that students will not get at four-year colleges. There is close communication with the other supporting programs such as math and sciences to ensure uniformity.

Some students from San Jose State enroll in our classes simply because they are offered at times/days suitable to their needs and the quality and content of the labs surpass those of SJSU. We offer classes on late Friday afternoons to provide access to all students from local communities.

- **4. If you received resource allocation for your last program review cycle, please indicate the resources you received and how these resources were utilized to impact student success and / or importance to your program. (The resources can be personnel or fiscal)**

Back in 2015 and 2016, we did receive some federal funding (not school funds) as part of our engineering technology and surveying. This allowed us to purchase some equipment for Engr. 66 and Engr. 71 labs. These additions have helped our students gain some valuable hands-on experience and be competitive with their university-level colleagues. However, unfortunately, this funding source has been discontinued and used in other places. For the last few years, we have not been able to upgrade any equipment. This impacts students since our program should, at the very minimum, correspond to those at SJSU.

The current faculty and the lab technician constantly repair all the broken equipment in-house.

- **5. Please describe where you would like your program to be three years from now (program goals) and how these support the college mission, strategic initiatives and student success.**

All efforts have been made by the current faculty to maintain the engineering program at its best compared to the other schools.

In three years, I would like our engineering program to

1. Move to the new facility that is currently being constructed. The first floor of the new General Education building will house the engineering program. This should happen in about 2.5 years from now.
 - The new facility will support the college's mission in providing current and appropriate educational access to the students.
 - The new facility will provide additional hands-on skills for the students, thus improving the graduation rate.
2. Acquire some new equipment, including computers.
 - The engineering program requires an extensive array of equipment and computers. To support the college's mission in providing access to the community, the engineering program must have, at a minimum, equivalent equipment as the transfer institutions. Our students transfer to four-year schools to complete their bachelor's degrees, thus they need to have the same training to be successful. This supports our college's mission!

3. Acquire a computer room in the new building. Unfortunately, at the moment, based on the current layout of the new facility, we will be losing our current computer room!

- To provide engineering educational opportunities for the community, access to computers is a must. It should be kept in mind that not all of our students are able to purchase the type of computer needed in engineering. Access to appropriate computers will help economically disadvantaged students. This supports our college mission.

4. Start offering Robotics certificates. This will require funding for equipment.

- One of our college's missions is to provide low-cost technical training so that the community members can seek current employment opportunities. Training in robotics will provide skills to secure employment in the local industry. This supports the overall college goal of increasing access and success.

5. Have the counseling department specifically assign a counselor to the engineering program. We used to have this in the past. This will help our students to get a uniform and appropriate counseling and program planning.

- Access to education without appropriate guidance and counseling does not result in student success. Our college mission is to make sure our students succeed in a timely manner.

6. Offer hybrid online Engr 69 and Engr. 50 classes.

- These two classes could potentially run in a hybrid online format. This will increase access to engineering education by those students who are working either part-time or full-time. This availability will allow the students to graduate or transfer earlier.

7. Hire a full-time faculty member to help with program development and updates. Engineering programs at universities change periodically, so our program has to adapt to these changes to stay current and viable.

- Addition of a full-time faculty will ensure that all of the college missions and goals are supported,

8. Maintain articulation with the universities.

- Our engineering program is a transfer program. For our students to succeed in their educational goals, which is to obtain a four-year degree, all of the courses that they have taken at the college must be transferable. We will make sure the appropriate articulation between the transfer schools is secured. The main college goal is thus supported.

Program Set Standards (Summary Tab)

Overall, EVC's Institution Set Standard for success rate is 72%, and the aspirational goal for student success is 75%.

Success Rate (completion with "C" or better)	Program	EVC	Program Set Standard (established during last comprehensive PR)	Program Success Goal (new)
F'14-F'20 average		71.10%		

Courses with no Degree or Certification

ENGR 001 - Technology and Society **Create / Modify DE Course**	Created: 11/17/2015 Originator: Abdollah Tabrizi
ENGR 061 - Plane Surveying **New Course**	Created: 10/21/2014 Originator: System Loaded
ENGR 060 - Surveying **New Course**	Created: 10/21/2014 Originator: System Loaded
ENGR 060 - Surveying **Modify Course**	Created: 06/20/2018 Originator: Abdollah Tabrizi
ENGR 001 - Technology and Society **Modify Course**	Created: 01/06/2021 Originator: Abdollah Tabrizi
ENGR 001 - Technology and Society **New Course**	Created: 10/21/2014 Originator: System Loaded
ENGR 060 - Surveying **Modify Course**	Created: 01/07/2021 Originator: Abdollah Tabrizi
ENGR 060 - Surveying **Create / Modify DE Course**	Created: 09/10/2020 Originator: Abdollah Tabrizi
ENGR 061 - Plane Surveying **Modify Course**	Created: 01/07/2021 Originator: Abdollah Tabrizi
ENGR 062 - Route Surveying, Curves and Earthwork **New Course**	Created: 10/21/2014 Originator: System Loaded
ENGR 063 - GIS for Civil Engineering and Surveying **New Course**	Created: 10/21/2014 Originator: System Loaded
ENGR 063 - GIS for Civil Engineering and Surveying **Modify Course**	Created: 01/07/2021 Originator: Abdollah Tabrizi
ENGR 063 - GIS for Civil Engineering and Surveying **Modify Course**	Created: 11/16/2015 Originator: Abdollah Tabrizi
ENGR 138 - Occupational Work Experience **New Course**	Created: 10/21/2014 Originator: System Loaded
ENGR 137 - Special Topics in Engineering **New Course**	Created: 10/21/2014 Originator: System Loaded
ENGR 200 - Engineering Supervised Lab **New Course**	Created: 10/21/2014 Originator: System Loaded
ENGR 210 - Engineering Supervised Tutoring **New Course**	Created: 10/21/2014 Originator: System Loaded
ENGR 500 - Introduction to Engineering **New Course**	Created: 08/01/2015 Originator: Abdollah Tabrizi
ENGR 500 - Introduction to Engineering **Modify Course**	Created: 08/06/2017 Originator: Abdollah Tabrizi
ENGR 500 - Introduction to Engineering **Create / Modify DE Course**	Created: 09/10/2020 Originator: Abdollah Tabrizi
ENGR 500 - Introduction to Engineering **Modify Course**	Created: 01/08/2021 Originator: Abdollah Tabrizi
ENGR 502 - Basic Math Applications in Engineering **Create / Modify DE Course**	Created: 07/15/2020 Originator: Abdollah Tabrizi
ENGR 502 - Basic Math Applications in Engineering **Modify Course**	Created: 01/07/2021 Originator: Abdollah Tabrizi
ENGR 502 - Basic Math Applications in Engineering **Modify Course**	Created: 08/10/2017 Originator: Abdollah Tabrizi

ENGR 502 - Basic Math Applications in Engineering **New Course**	Created: 08/04/2015 Originator: Abdollah Tabrizi
ENGR 502 - Basic Math Applications in Engineering **Modify Course**	Created: 07/06/2016 Originator: Abdollah Tabrizi
ENGR 504 - Technical and Contextualized Communication in Engineering **Modify Course**	Created: 08/23/2016 Originator: Abdollah Tabrizi
ENGR 504 - Technical and Contextualized Communication **New Course**	Created: 08/08/2015 Originator: Abdollah Tabrizi
ENGR 504 - Technical and Contextualized Communication in Engineering **Modify Course**	Created: 08/12/2017 Originator: Abdollah Tabrizi
ENGR 504 - Technical and Contextualized Communication in Engineering **Modify Course**	Created: 01/08/2021 Originator: Abdollah Tabrizi
ENGR 506 - Basic Principles of Engineering **Modify Course**	Created: 01/07/2021 Originator: Abdollah Tabrizi
ENGR 506 - Basic Principles of Engineering **New Course**	Created: 08/09/2015 Originator: Abdollah Tabrizi
ENGR 506 - Basic Principles of Engineering **Modify Course**	Created: 08/23/2016 Originator: Abdollah Tabrizi
ENGR 098 - Directed Study in Engineering **New Course**	Created: 10/21/2014 Originator: System Loaded
ENGR 136 - Engineering Occupational Work Experience-Parallel Plan **New Course**	Created: 10/21/2014 Originator: System Loaded

Program Success Rate 70.37%

Program Set Standard: It is recommended that programs identify a success standard. This standard should reflect the baseline success rate.

Program Set Standard 67%

Recommendation: 90% of the 6 year average success rate could be your program standard (average x 0.9).

Program Success Goal: It is recommended that programs identify a success goal. This goal should reflect the success rate to which your program aspires.

Program Success Goal 72%

- **Is your program success rate higher or lower than the campus?**

The program success rate is 70.37%, which is slightly lower than the campus's 71.10%. The program's success rate is good considering the fact that this program is highly technical and requires many skill sets, such as advanced math and physics.

- **If your success rate is higher than the campus, how are you helping students succeed in and outside the classroom? If your program success rate is lower, what are some strategies your program is implementing to improve?**

The program success rate is virtually the same as that of the campus. However, the program has always been active in implementing improvements by staying current in both theoretical and hands-on activities. Most engineering students' learning is experiential. All efforts are being made and will

continue to be made to design new labs and new ways of communicating the material to the students.

With the availability of canvas resources and abilities, more and more supplemental material is now being provided for the students. This will include additional problem-solving examples and links to other resources online.

- **Is the current program success rate higher than the program set standard?**

The program's success rate was 70.37% which is higher than the set program standard (67%). So the program has achieved its set standard.

- **How close is the program to meeting the program success goal?**

The program success goal is set at 72% and the current success rate is 70.37%. Even though the program has achieved its set standard, it is important to push ahead and improve.

The problem we are facing is the fact that many students have part-time jobs, and sometimes full-time, and they continue taking almost a full load! This, unfortunately, results in less than desired results. In addition, we also have students from SJSU that are enrolled and quite often these students drop out due to a lack of focus! This impacts the program statistics.

- **Are these measures (program set standard and program success goal) still current/accurate? If not, please describe here and reset the standards.**

Yes they are current and accurate.

Success Rates: Measures by IPEDs Race/Ethnicity

- **American Indian**
Program Average Total Enrolled
 2.000
Program Success Rate
 83.330
- **Asian**
Program Average Total Enrolled
 93.000
Program Success Rate
 74.590
- **Black or African American**
Program Average Total Enrolled
 3.000
Program Success Rate
 45.380
- **Hawaiin/Pacific Islander**

Program Average Total Enrolled

1.000

Program Success Rate

70.000

- **Hispanic**

Program Average Total Enrolled

41.000

Program Success Rate

61.590

- **Two or More Races**

Program Average Total Enrolled

5.000

Program Success Rate

66.390

- **Unknown**

Program Average Total Enrolled

13.000

Program Success Rate

69.710

- **White**

Program Average Total Enrolled

14.000

Program Success Rate

70.530

Success Rates: Measures by Gender

- **Female**

Program Average Total Enrolled

33.000

Program Success Rate

76.760

- **Male**

Program Average Total Enrolled

137.000

Program Success Rate

68.820

- **No Value Entered**

Program Average Total Enrolled

1.000

Program Success Rate

60.000

Success Rates: Measures by Age

- **17 & Below**

Program Average Total Enrolled

1.000

Program Success Rate

85.710

- **18-24**

Program Average Total Enrolled

106.000

Program Success Rate

70.410

- **25-39**

Program Average Total Enrolled

56.000

Program Success Rate

69.380

- **40 & Over**

Program Average Total Enrolled

7.000

Program Success Rate

71.600

- **Unknown**

Program Average Total Enrolled

0.000

Program Success Rate

0.000

- **a. With respect to disaggregated success rates, list any equity gaps that are identified and discuss interventions your program will implement to address these equity gaps? Please include a timeline of implementation and reassessment.**

The table shown reflects the program's student demographics and associated success rates.

Program's enrollment & success data

Ethnicity	Enrollment	success rate	EVC success rate
Asian	54%	75%	79%
Latinx	24%	62%	65%

Black	2%	45%	61%
White	8%	14%	74%
American Indian	1.2%	83%	78%
others	10.8%	69%	73%

Almost 80% of the enrolled make up Asian and Latinx students. The success rates of these two groups are almost similar to those of EVC. The number of enrolled American Indian, Black, and White students is very few, and it is statistically difficult to make any conclusions. However, compared to the overall program success rate of 70.37%, the success rate of the Latinx group (62%) could be improved. Although there are many factors for the lower success rate of Latinx, which may depend on factors beyond the program itself, the following intervention will help not only the Latinx group but everyone in the program:

1. Availability of AutoCADD Inventor - this software is used in the program and for many years it was expensive and we only had it in our computer lab. However, recently the company has made it free for our students. In order to actually download it and install it on a personal computer, there is some hardware requirement. Some of our students may not be able to install this software on their systems. For this reason, we will continue providing access to the lab facilities during open-lab hours. It is hoped that the school will provide a computer room in the new general education building so that this can be done once the program moves into the new building.
 2. To improve success rates and close the gap, provide supervised access to the circuit analysis lab so that students could practice with the equipment. Generally, engineering students are experiential learners, so any additional learning opportunity will help.
 3. It is also suggested that the school loan laptops to some of the students identified by the department. These laptops will have the required software that is used in the program.
- **b. With respect to disaggregated success rates (ethnicity / race, gender and age), discuss student performance in reaching your program set standard for student success as well as reaching the program success goal.**

The engineering program is a transfer program, thus it requires students to have a grade of "C" or better in each course to be transferred. The required program standard is set at 70% to reflect this requirement. With the exception of one course, Engr 69, all the other courses have hands-on laboratory components. This means that a fairly good percentage of the total grade on the course is associated with the lab performance. This provides an opportunity for the department to provide additional laboratory access to those who need to improve.

Due to the nature of the major, students are required to have an extensive background in mathematics, physics, and some in chemistry. Unfortunately, in recent years we have observed a drop in the students' skills in these areas. Based on the data provided in part (a) above, we will plan a discussion with the Enlace program to see if we can improve Latinx students' success. Even though, as pointed out before, the number of black students enrolled is low, thus making any kind of assessment statistically difficult, we will still communicate with the AFFIRM program to see if measures could be taken to improve both the enrollment as well as the success rates of the black students. I have made a few presentations in the past to the AFFIRM program relative to enrollment. However, in the last four years, we have not been approached by the AFFIRM program to participate in outreach.

Lastly, it will be beneficial to our students to have some tutoring opportunities. Unfortunately, it is rare for our engineering students to provide any kind of tutoring, since by the time they are ready to tutor, they transfer to universities. However, I recommend hiring a few of our previous students from SJSU as tutors. Of course, this involves some expenses that school has to accommodate. This additional resource will help our Latinx, black, and white students.

- **c. If your program offers course sections fully online, please contact the office of Research, Planning and Institutional Effectiveness to obtain a student success report on the online sections. Address any differences in student success rates between fully online courses and classroom courses.**

At the present time, we do not offer fully online courses in our degree programs (AA/AS). We only offer a single stand-alone course, Engr. 001, which has a GE designation and it is done fully online but it is not part of the degree program. The success rate on this course is at 100% level, discounting one or two students who drop the class due to work etc.

Program Awards - If Applicable

If the classes in your program lead to a degree or certificate, please visit the DataMart and indicate how many degrees/certificates were awarded in your program:

**http://datamart.cccco.edu/Outcomes/Program_Awards.aspx
(http://datamart.cccco.edu/Outcomes/Program_Awards.aspx)**

You will need to select drop down menus and then “select program type by major of study” (for example, select Legal for paralegal studies).

Then at the bottom of the report, select the box “program type- four digits TOP”, then update report to get program specific information.

Degree Type

- **AA**
Number of Awards (Examine 2017-18, 2018-19 data, 2019-20 data and 2020-21 data)
1

Discussion

The engineering program at EVC is a transfer program. Generally, students transfer to four-year schools after they have completed the courses that they need to transfer. There are many disciplines within engineering, such as mechanical, electrical, and computer engineering, just to name a few. Each one of these disciplines has different requirements. So our students do not necessarily take all of the courses within our AA degree program. As a result, very few students pursue an AA degree from EVC.

Total number of AA degrees = 1

(Total units including GE = 96-101)

- **AS**
Number of Awards (Examine 2017-18, 2018-19 data, 2019-20 data and 2020-21 data)
10

Discussion

As pointed out above, our engineering students transfer to four-year schools once they have completed the courses that are required by their respective disciplines. Very few students actually petition for graduation.

Total number of degrees in AS = 10

(Total units including GE = 73-77)

The reason for higher number of awards compared to the AA degree is the number of units required.

Student Enrollment Types

Related Assessments

ENGR 001 - Technology and Society - Active (Tabrizi, Abdollah) (01/25/2022)

ENGR 001 - Technology and Society (Tabrizi, Abdollah)

ENGR 001 - Technology and Society (Tabrizi, Abdollah)

ENGR 010 - Engineering Processes and Tools - Active (Tabrizi, Abdollah) (01/25/2022)

ENGR 018 - Engineering Design and Graphics - Active (Tabrizi, Abdollah) (02/02/2022)

ENGR 050 - Introduction to Computing - Active (Tabrizi, Abdollah) (02/02/2022)

ENGR 060 - Surveying - Active (Tabrizi, Abdollah) (02/02/2022)

ENGR 060 - Surveying (Tabrizi, Abdollah)

ENGR 066 - Properties of Materials - Active (Tabrizi, Abdollah) (02/02/2022)

ENGR 069 - Statics - Active (Tabrizi, Abdollah) (02/02/2022)

ENGR 071 - Introduction to Circuit Analysis - Active (Tabrizi, Abdollah)

ENGR 071 - Introduction to Circuit Analysis - Active (Tabrizi, Abdollah) (02/03/2022)

ENGR 500 - Introduction to Engineering - Active (Tabrizi, Abdollah) (03/21/2022)

ENGR 500 - Introduction to Engineering (Tabrizi, Abdollah)

ENGR 500 - Introduction to Engineering (Tabrizi, Abdollah)

ENGR 500 - Introduction to Engineering (Tabrizi, Abdollah)

ENGR 506 - Basic Principles of Engineering (Tabrizi, Abdollah)

Engr. PLO Assessment 2022 (Tabrizi, Abdollah)

Student Enrollment Type: Day or Evening Student

- **Day: 4721 - 51.130%**

Program Average Headcount

52.000

Program Percentage of Total

33.500

- **Day & Evening: 3111 - 33.690%**

Program Average Headcount

100.000

Program Percentage of Total

64.500

- **Evening: 1061 - 11.490%**

Program Average Headcount

3.000

Program Percentage of Total

1.900

Student Enrollment Type: Academic Load

- **Full Time: 2259 - 24.450%**

Program Average Headcount

58.000

Program Percentage of Total

37.400

- **Half Time or less than half time: 6214 - 67.280%**

Program Average Headcount

74.000

Program Percentage of Total

47.700

- **a. Discuss any changes in program enrollment types (day vs evening, full-time vs part-time) since your last program review?**

Our program did not offer any evening section in the past. Since the last program review, we have added one evening section of Engr. 10. The enrollment in this evening section has always been at the course capacity of 25. However, we always enroll up to 8 more students.

- **b. Discuss how do your program enrollments (Pct of total) compare to EVC?**

Day Classes:

Program enrollment of 52% is just about the same percentage as EVC at 51%.

Day&Evening:

Program enrollment of 64.5% is higher than that of EVC at 33.7. This is expected since we try to offer our courses during times not to conflict with the supporting courses such as math, physics, and chemistry. So, as a result, we offer many afternoon and late afternoon classes.

Evening:

Program enrollment of 1.9% is much less than that of EVC at 11.5. We only offer one single evening class. Due to the limited enrollment numbers, we can't offer additional evening classes without impacting the enrollment in the day sections.

Full-time Enrollment:

Program enrollment of 37.4% is higher than that of EVC at 24.5%. This is expected since the engineering program is a transfer program and engineering students typically get their bachelor's degree in about 4.5 years (2 years at EVC and 2.5 years at the transfer school). So full-time enrollment is critical.

Half-time & Less than Half-time:

Program enrollment of 47.7% is less than that of EVC at 67.3%. As was mentioned above, our engineering students generally tend to have full-time loads.

- **c. Based on the data, would you recommend any changes?**

For the sake of increasing access to the local students, it is possible to offer an evening section of our Engr. 71 and Engr. 50 classes. However, this would require us to offer a day section in the Fall and an evening section in the Spring. Unfortunately, there aren't enough students to allow us to offer two sections of these courses every semester.

Student Demographics - Headcount

Related Assessments

ENGR 001 - Technology and Society - Active (Tabrizi, Abdollah) (01/25/2022)
 ENGR 001 - Technology and Society (Tabrizi, Abdollah)
 ENGR 001 - Technology and Society (Tabrizi, Abdollah)
 ENGR 010 - Engineering Processes and Tools - Active (Tabrizi, Abdollah) (01/25/2022)
 ENGR 018 - Engineering Design and Graphics - Active (Tabrizi, Abdollah) (02/02/2022)
 ENGR 050 - Introduction to Computing - Active (Tabrizi, Abdollah) (02/02/2022)
 ENGR 060 - Surveying - Active (Tabrizi, Abdollah) (02/02/2022)
 ENGR 060 - Surveying (Tabrizi, Abdollah)
 ENGR 066 - Properties of Materials - Active (Tabrizi, Abdollah) (02/02/2022)
 ENGR 069 - Statics - Active (Tabrizi, Abdollah) (02/02/2022)
 ENGR 071 - Introduction to Circuit Analysis - Active (Tabrizi, Abdollah)
 ENGR 071 - Introduction to Circuit Analysis - Active (Tabrizi, Abdollah) (02/03/2022)
 ENGR 500 - Introduction to Engineering - Active (Tabrizi, Abdollah) (03/21/2022)
 ENGR 500 - Introduction to Engineering (Tabrizi, Abdollah)
 ENGR 500 - Introduction to Engineering (Tabrizi, Abdollah)
 ENGR 500 - Introduction to Engineering (Tabrizi, Abdollah)
 ENGR 506 - Basic Principles of Engineering (Tabrizi, Abdollah)
 Engr. PLO Assessment 2022 (Tabrizi, Abdollah)

Student Demographic: Gender

- **Female: 5022 - 54.390%**

Program Headcount

34.000

Program Percentage of Total

21.660

- **Male: 4176 - 45.220%**

Program Headcount

120.000

Program Percentage of Total

76.400

- **No Value Entered: 36 - 0.390%**

Program Headcount

3.000

Program Percentage of Total

1.900

Student Demographic: Age

- **17 & Below: 465 - 5.000%**

Program Headcount

1.000

Program Percentage of Total

0.640

- **18-24: 5542 - 59.990%**

Program Headcount

92.000

Program Percentage of Total

58.970

- **25-39: 2214 - 24.010%**

Program Headcount

49.000

Program Percentage of Total

31.410

- **40 & Over: 1006 - 10.900%**

Program Headcount

12.000

Program Percentage of Total

7.690

- **Unknown: 9 - 0.100%**

Program Headcount

2.000

Program Percentage of Total

1.280

Student Demographic: Race/Ethnicity (IPEDs Classification)

- **American Indian: 45 - 0.480%**

Program Headcount

2.000

Program Percentage of Total

1.270

- **Asian: 3675 - 39.790%**
Program Headcount
81.000
Program Percentage of Total
51.270
- **Black or African American: 218 - 2.360%**
Program Headcount
4.000
Program Percentage of Total
2.530
- **Hawaiin/Pacific Islander: 38 - 0.410%**
Program Headcount
1.000
Program Percentage of Total
0.630
- **Hispanic: 3650 - 39.500%**
Program Headcount
41.000
Program Percentage of Total
25.950
- **Two or More Races: 245 - 2.650%**
Program Headcount
4.000
Program Percentage of Total
2.530
- **Unknown: 773 - 8.390%**
Program Headcount
13.000
Program Percentage of Total
8.230
- **White: 591 - 6.420%**
Program Headcount
12.000
Program Percentage of Total
7.590
- **a. Based on the program total headcount and percent change year to year, discuss if your program growing or declining. If so, what do you attribute these changes in enrollment to and what changes will the program implement to address them?**

The program enrollment and year-to-year changes depend on many factors. This is a transfer program and the ultimate goal of the students is to transfer to four-year schools. The majority of our students transfer to SJSU. The following are some possible reasons for the fluctuations seen in our enrollment pattern:

1. Students can transfer to universities upon completion of their GE classes. There is no set requirement for taking engineering classes for transfer. Of course, this varies from school to school, especially with UC.
2. The entrance (acceptance) requirement for SJSU changes from year to year. Different disciplines change their minimum GPA requirement, sometimes higher and sometimes lower. Since most of our students transfer to SJSU, this impacts our enrollment.
3. SJSU sometimes only accepts fall transfers and sometimes twice a year. This also impacts our enrollment.
4. Fluctuations in the local economy also impact our enrollment. When the economy slows down, our enrollment goes up. When the economy is good, our enrollment drops not just because our students are seeking employment, but it is also because SJSU reduces their requirement for acceptance to increase their enrollment! This impacts our enrollment as well.
5. Years 2020 and 2021 also impacted the program to some degree due to COVID-19.

Despite the above, the engineering program has been solid and all of our classes have been fully enrolled. This is evident from the capacity data for the courses within the program. A file containing statistical data about the program is attached. The program has experienced a modest growth in enrollment.

The comparison data for the ethnicity headcount of the program and EVC are given in the next section. Referring to Table 1 in section b, Engineering Asian enrollment is much higher than that of EVC (51.3% versus 39.8%). The enrollment of Hispanics is lower in Engineering (26.0% versus 39.5%). This could be due to the lack of preparatory courses such as math. Engineering subjects require an extensive array of math, physics, and chemistry. So, with proper counseling and training in these prep courses, the enrollment of Hispanic students should increase in Engineering. Over the years, Dr. Tabrizi has made and continues making presentations about the engineering program at the meeting of the local high school counselors hosted by EVC. Dr. Tabrizi also makes presentations every year at the SACNAS conference host at EVC. These efforts are made in an attempt to persuade Hispanic students to pursue technical education. The enrollment of American Indian, Black, Pacific Islander, and White are pretty much the same as those of the college.

- **b. Discuss any gaps have you identified in your program. Discuss how your program enrollment is similar or different from the campus. Discuss which gender, age, and/or ethnic group are proportionally smaller than campus make up.**

The program enrollment as compared to the EVC's total population enrollment is shown in tables 1 to 3 below.

Based on the ethnicity data shown in table 1 below, Asian students make up more than 50% of the enrollment compared to 39.79% for the campus. The percentage of Latinx (24%) is lower than that of EVC (39.5%). One reason for this could be the requirement for a high level of mathematics and physics in the program. The other groups, i.e. black and white percentages compare well with those of EVC enrollment.

Table 1: Ethnicity Enrollment Comparison

Ethnicity	Program Enrollment	EVC Enrollment
Asian	54%	39.79%
Latinx	24%	39.5%
Black, African American	2%	2.39%
White	8%	6.42%
American Indian	1.2%	0.48%
Two or more races	2.53%	2.65%
Unknown	8.23%	8.39%

Data shown in table 2, indicates that classes in the program are offered primarily in the daytime and late afternoons. There is only a single class with only one section that is offered in the evenings. Unfortunately, due to the enrollment numbers, the program can't support both day and evening sections for the same course. However, we will plan for alternating offerings between the day and evenings. Some students have expressed interest in taking evening classes.

Table 2: Day/Evening enrollment comparison

	Program Enrollment	EVC Enrollment
Day	54%	75%
Day & Evening	24%	62%
Evening	2%	45%

The enrollment type is shown in table 3. Full-time enrollment makes up 37.4% of the total enrolled in the program. This is higher than that of EVC at 24.5%. The higher full-time enrollment may be due to the nature of the transfer program.

Table 3: Full-time/Part-time enrollment comparison

	Program Enrollment	EVC Enrollment
Full-Time	37.4%	24.5%
Half-Time	47.7%	67.3%

- c. Discuss what interventions the program can implement to address any gaps in enrollment.**

In the previous section, it pointed out that the program's enrollment of the Latinx group (24%) is lower than that of the EVC Latinx group (39.5%). One reason for this may be due to the lack of necessary mathematics and sciences preparatory skills. One way of reaching out and helping Latinx students is to provide more specific counseling. In the past, we had a specific counselor who was assigned to engineering. I worked very closely with this counselor and made sure he knew all about the program and what students needed to do to get into engineering. We also need to inform the high school counselors of what we can offer to their students and what they need to do to help their Latinx students. In the past, I have made many presentations to high school counselors. I have also been involved with the EVC's SACNAS. We need to continue giving the right message to the students that engineering education is quite possible and help them prepare appropriately.

Similarly, in the past, I have made presentations to the AFFIRM program and discussed what we can do to help our black and African American students.

I hope both Enlace and Affirm programs will reach out and see how our engineering department could help in improving enrollment and the success of the students.

Institutional Effectiveness (6.5 year average, see Summary Tab)

EVC Capacity: 62.49% EVC Productivity: 14.72

Program Capacity

82.93

Program Productivity

13.05

Is your capacity rate higher or lower then the campus?

Higher

Is your productivity goal higher or lower than the campus?

Lower

If the program capacity and/or productivity is lower than the campus, please provide rationale:

We offer only one section of each course with the exception of our Engr 10. So we do over-enroll through the add process. So, as expected, the capacity rates are better than those of the campus at the census time.

The productivity rate is slightly lower than the campus, by 1.7%. This is a minor variation, but it should be noted that engineering is a highly technical program and its enrollment is limited.

Curriculum

Related Assessments

ENGR 001 - Technology and Society - Active (Tabrizi, Abdollah) (01/25/2022)

ENGR 001 - Technology and Society (Tabrizi, Abdollah)

ENGR 001 - Technology and Society (Tabrizi, Abdollah)

ENGR 010 - Engineering Processes and Tools - Active (Tabrizi, Abdollah) (01/25/2022)

ENGR 018 - Engineering Design and Graphics - Active (Tabrizi, Abdollah) (02/02/2022)

ENGR 050 - Introduction to Computing - Active (Tabrizi, Abdollah) (02/02/2022)

ENGR 060 - Surveying - Active (Tabrizi, Abdollah) (02/02/2022)

ENGR 060 - Surveying (Tabrizi, Abdollah)

ENGR 066 - Properties of Materials - Active (Tabrizi, Abdollah) (02/02/2022)

ENGR 069 - Statics - Active (Tabrizi, Abdollah) (02/02/2022)

ENGR 071 - Introduction to Circuit Analysis - Active (Tabrizi, Abdollah)

ENGR 071 - Introduction to Circuit Analysis - Active (Tabrizi, Abdollah) (02/03/2022)

ENGR 500 - Introduction to Engineering - Active (Tabrizi, Abdollah) (03/21/2022)

ENGR 500 - Introduction to Engineering (Tabrizi, Abdollah)

ENGR 500 - Introduction to Engineering (Tabrizi, Abdollah)

ENGR 500 - Introduction to Engineering (Tabrizi, Abdollah)

ENGR 506 - Basic Principles of Engineering (Tabrizi, Abdollah)

Engr. PLO Assessment 2022 (Tabrizi, Abdollah)

Courses with no Degree or Certification

- ENGR 001 - Technology and Society - Historical
- ENGR 001 - Technology and Society - Historical
- ENGR 001 - Technology and Society - Historical
- ENGR 060 - Surveying - Active
- ENGR 060 - Surveying - Historical
- ENGR 060 - Surveying - Historical
- ENGR 060 - Surveying - Historical
- ENGR 061 - Plane Surveying - Historical
- ENGR 061 - Plane Surveying - Active
- ENGR 062 - Route Surveying, Curves and Earthwork - Historical
- ENGR 063 - GIS for Civil Engineering and Surveying - Historical
- ENGR 063 - GIS for Civil Engineering and Surveying - Historical
- ENGR 063 - GIS for Civil Engineering and Surveying - Active
- ENGR 098 - Directed Study in Engineering - Historical
- ENGR 136 - Engineering Occupational Work Experience-Parallel Plan - Historical
- ENGR 137 - Special Topics in Engineering - Historical
- ENGR 138 - Occupational Work Experience - Historical
- ENGR 200 - Engineering Supervised Lab - Historical
- ENGR 210 - Engineering Supervised Tutoring - Historical
- ENGR 500 - Introduction to Engineering - Historical
- ENGR 500 - Introduction to Engineering - Historical
- ENGR 500 - Introduction to Engineering - Historical
- ENGR 500 - Introduction to Engineering - Active
- ENGR 502 - Basic Math Applications in Engineering - Historical
- ENGR 502 - Basic Math Applications in Engineering - Historical
- ENGR 502 - Basic Math Applications in Engineering - Historical
- ENGR 502 - Basic Math Applications in Engineering - Historical
- ENGR 502 - Basic Math Applications in Engineering - Historical
- ENGR 504 - Technical and Contextualized Communication in Engineering - Historical
- ENGR 504 - Technical and Contextualized Communication - Historical
- ENGR 504 - Technical and Contextualized Communication in Engineering - Historical
- ENGR 504 - Technical and Contextualized Communication in Engineering - Historical
- ENGR 506 - Basic Principles of Engineering - Historical
- ENGR 506 - Basic Principles of Engineering - Historical
- ENGR 506 - Basic Principles of Engineering - Historical

- **1. Identify and updates to curriculum since the last comprehensive program review, including and new programs and indicate the 6-year timeline for scheduled course outline revision. For CTE, the time line is 2 year.**

Engr. 001 "Technology & Society":

This course is a stand-alone course and is not part of the AA/AS degrees. It satisfies area D GE. The course outline is current and will be revised in 2026.

Engr. 60 "Surveying", 61 "Plane Surveying", and 63 "GIS for Civil Engineering & Surveying":

These courses are not part of the AA/AS degrees. They were part of our Surveying and Geomatics program but have been deactivated.

Engr. 98 "Directed Study in Engineering", 136 "Engineering Occupational Work Experience-Parallel Plan", 137 "Special Topics in Engineering", 138 "Occupational Work Experience", 200 "Engineering Supervised labs", 210 "Engineering Supervised Tutoring":

These courses are not part of the AA/AS degrees. They have been deactivated.

Engr. 500 "Introduction to Engineering":

This is a stand-alone non-credit course. The course outline is current and will be updated in 2026.

Engr. 502 "Basic Math Application in Engineering", 504 "Technical and Contextualized Communication", 506 "Basic Principles of Engineering":

These are stand-alone non-credit courses that have been deactivated.

No other changes have been made to the program. All the program course outlines are current and will be updated in 2026.

- **2. Identify all the courses offered in the program and describe how these courses remain relevant in the discipline. For courses your program has not offered in the past two years, please discuss a plan on how to deal with these courses (if your program is not going to deactivate these courses, please explain why).**

Courses in the engineering program are:

Course	Title	Units
Engr. 001	Technology & Society	3 (lecture)
Engr. 010	Engineering Processes and Tools	3 (2 lectures, 1 lab)
Engr. 018	Engineering Design and Graphics	3 (2 lectures, 1 lab)
Engr. 050	Introduction to Computing	4 (3 lectures, 1 lab)
Engr. 066	Properties of Materials	3 (2 lectures, 1 lab)
Engr. 069	Statics	3 (lecture)
Engr. 71	Introduction to Circuit Analysis	4 (3 lectures, 1 lab)
Engr. 500	Introduction to Engineering	1.5 (lecture)

The core courses, i.e. Engr. 10, 18, 50, 66, 69, and 71, are required for transfer to four-year schools. They are articulated with CSU and UC systems. They remain relevant in the major.

Engr. 001 is a stand-alone course satisfying the area D in GE. It offers an alternative to the other area D courses. This course is offered periodically.

Engr. 500 is a stand-alone non-credit course designed for those who are exploring the possibility of pursuing a career in engineering. This course is offered periodically.

- 3. If you have a degree or certificate, please include a diagram of your program's guided pathways program map. (A program map indicates courses suggested for each semester, across two years, upon completion a student would qualify for a degree/certificate).

Program Requirements

The engineering program requirements are met by core engineering courses offered by the engineering department and courses from the support departments, such as physics, chemistry, and mathematics. Tables 1,2 and 3 detail the requirements of the major requirements, course sequencing, and GE pattern.

Table 1 Associate in Arts Major Requirements in Engineering

Course	Title	Units
ENGR 010	Engineering Processes and Tools	3
ENGR 018	Engineering Design and Graphics	3
ENGR 050	Introduction to Computing	4
ENGR 066	Properties of Materials	3
ENGR 069	Statics	3
ENGR 071	Introduction to Circuit Analysis	4
CHEM 001A	General Chemistry	5
ENGL 001A	English Composition	3
MATH 071 or MATH 066	Calculus I With Analytic Geometry	5 4
MATH 072 or MATH 067	Calculus II With Analytic Geometry	5 4
MATH 073	Multivariable Calculus	5
MATH 078	Differential Equations	4
PHYS 004A or PHYS 007A	General Physics	5 4
PHYS 004B or PHYS 007B	General Physics	5 4
PHYS 004C or PHYS 007C	General Physics	5 4

Table 2 Associate in Arts Total Unit Requirements in Engineering

Course	Units
Major Requirements	57-62
General Education Requirements (Note: Some of the courses, such as math and physics, that are listed in the major will be double-counted. So the actual number of GE units will be lower.)	39
Total units	96-101

Table 3 Associate in Arts Course Sequencing and GE Pattern in Engineering

Term 1	Units	CSU GE	NOTES
ENGR 010	3		
ENGL 001A	3	A2	
MATH 071 or MATH 066	5 4	B4	
GE	3	C1	
GE	3	B2	
Physical Activity	1		
Total Units	17-18		

Term 2	Units	CSU GE	NOTES
ENGR 018	3		
MATH 072 or MATH 067	5 4		
PHYS 004A or PHYS 007A	5 4	B1/B3	
GE	3	A1	
GE	3	A3	
Total Units	17-19		

Term 3	Units	CSU GE	NOTES
ENGR 050	4		
MATH 073	5		
CHEM 001A	5		
GE	3	C2	
Total Units	17		

Term 4	Units	CSU GE	NOTES
MATH 078	4		
PHYS 004B or PHYS 007B	5 4		
Engr. 069	3		
GE	3	D	
GE	3	C1 or C2	
Total Units	17-18		

Term 5	Units	CSU GE	NOTES
PHYS 004C or PHYS 007C	5 4		
Engr. 066	3		
Engr. 071	4		
GE	3	D	
GE	3	E	
Total Units	17-18		

Term 6	Units	CSU GE	NOTES
GE	3	D	Engr. 001 (or any other GE in summer or intersession)

Total Units	3		
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* CSU Graduation Requirement: Students must complete a set of courses that meet the US-1, US-2, and US-3 American Institutions' requirement

+ Cultural Pluralism Graduation Requirement: Student must complete a course that meets EVC's Cultural Pluralism/Ethnic Studies requirement

Physical Activity Graduation Requirement: Student must complete a course that meets EVC's Physical Activity requirement

A.A. Degree – Math Competency is a MATH course with a prerequisite of MATH 013

- **4. Identify and describe innovative strategies or pedagogy your department/program developed/offered to maximize student learning and success. How did they impact student learning and success?**

To maximize student learning and ultimate success, the engineering department has focused on hands-on training through laboratory experiments. To this end, lab experiments are periodically updated to reflect changes in the industry as well as the transfer schools. In addition, we have made some kits in our circuit analysis lab for students to check out so that they can practice building circuits at home. We have also made the labs available to the students on an appointment basis. This does require additional faculty time, but it does help students. These opportunities are especially valuable at the beginning of the semester, since our students lack hands-on experience when they come to engineering.

The engineering department prides itself on staying current with the latest developments in technology and responding to changes that are made to the curriculum at universities. Once a year, we redesign many of our experiments which require designing new apparatus for each.

We always get positive feedback from the students about the labs in engineering.

- **5. Discuss plans for future curricular development and/or program degrees & certificates included) modification.**

Our curriculum is based on the transfer needs of our students. We respond to any change that takes place at the four-year schools. However, we do periodically update our laboratory experiments. It is hoped that when we move into our new facility in about two years, we will be given the opportunity to update our equipment. Then we can update our labs accordingly.

We also have created a Robotics certificate. However, due to lack of funds and support, this program has not been offered. It is hoped that the school will fund this program so that the labs are created and ultimately offered to the community.

- **6. Describe how your program is articulated with High School Districts, and/or other four year institutions. (Include articulation agreements, CID, ADTs...)**

The engineering program is a transfer program. Thus, it is articulated with the four-year schools. Our main transfer school is SJSU but we do transfer to other CSUs and UCs as well. We offer a general lower-division curriculum in engineering. However, our students transfer into specific majors in

engineering such as mechanical, electrical, etc. So our individual courses are articulated with each one of these specific majors as seen from the table listed below. This table shows articulations between SJSU's various engineering majors and EVC. Similarly, EVC engineering courses are articulated with the UC engineering majors.

The Engineering department also has an articulation agreement with Milpitas High School. The agreement is shown below, after SJSU agreements.

Articulation Agreements with SJSU:

Articulation Agreement by Department		
SJSU		Evergreen Valley College
Aerospace Engineering		
AE 20	<-----	ENGR 18
AE 30	<-----	ENGR 50

Articulation Agreement by Department		
SJSU		Evergreen Valley College
Mechanical Engineering		
ME 20	<-----	ENGR 18
ME 30	<-----	ENGR 50

Articulation Agreement by Department		
SJSU		Evergreen Valley College
Electrical Engineering		
EE 30	<-----	ENGR 50
EE 97	<-----	ENGR 71
EE 98	<-----	ENGR 71

Articulation Agreement by Department		
SJSU		Evergreen Valley College
Computer Engineering		
CMPE 30	<-----	ENGR 50

Articulation Agreement by Department		
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SJSU		Evergreen Valley College
Civil Engineering		
CE 8	<-----	ENGR 60
CE 20	<-----	ENGR 50 & ENGR 18
CE 95	<-----	ENGR 69
CE 99	<-----	ENGR 69

Articulation Agreement by Department		
SJSU		Evergreen Valley College
Materials Engineering		
MATE 25	<-----	ENGR 18

Articulation Agreement

Engr. 010 "Engineering Processes and Tools"

EVC & Milpitas High School

(2015-2016)

A copy of this agreement is attached.

CID articulation:

Engr. 18 has a CID of ENGR 150.

- 7. If external accreditation or certification is required, please state the certifying agency and status of the program.

N/A

Student Learning Outcome and Assessment

Related Assessments

ENGR 001 - Technology and Society - Active (Tabrizi, Abdollah) (01/25/2022)

ENGR 001 - Technology and Society (Tabrizi, Abdollah)

ENGR 001 - Technology and Society (Tabrizi, Abdollah)

ENGR 010 - Engineering Processes and Tools - Active (Tabrizi, Abdollah) (01/25/2022)

ENGR 018 - Engineering Design and Graphics - Active (Tabrizi, Abdollah) (02/02/2022)

ENGR 050 - Introduction to Computing - Active (Tabrizi, Abdollah) (02/02/2022)

ENGR 060 - Surveying - Active (Tabrizi, Abdollah) (02/02/2022)

ENGR 060 - Surveying (Tabrizi, Abdollah)

ENGR 066 - Properties of Materials - Active (Tabrizi, Abdollah) (02/02/2022)
ENGR 069 - Statics - Active (Tabrizi, Abdollah) (02/02/2022)
ENGR 071 - Introduction to Circuit Analysis - Active (Tabrizi, Abdollah)
ENGR 071 - Introduction to Circuit Analysis - Active (Tabrizi, Abdollah) (02/03/2022)
ENGR 500 - Introduction to Engineering - Active (Tabrizi, Abdollah) (03/21/2022)
ENGR 500 - Introduction to Engineering (Tabrizi, Abdollah)
ENGR 500 - Introduction to Engineering (Tabrizi, Abdollah)
ENGR 500 - Introduction to Engineering (Tabrizi, Abdollah)
ENGR 506 - Basic Principles of Engineering (Tabrizi, Abdollah)
Engr. PLO Assessment 2022 (Tabrizi, Abdollah)

Student Learning Outcomes

CHEM 001A - General Chemistry - Distinguish between ionic vs. covalent compounds, write names and chemical formulas, and classify and balance chemical reactions. (Active)

CHEM 001A - General Chemistry - Interpret chemical reactions occurring in the macroscopic world using microscopic principles, and recognize quantitative relationships from balanced chemical equations. (Active)

CHEM 001A - General Chemistry - Describe gaseous behavior using the Kinetic Molecular Theory as a theoretical model and use this model to solve problems. (Active)

CHEM 001A - General Chemistry - Correlate the properties of liquids, solids, and solutions with molecular geometry and intermolecular interactions. (Active)

CHEM 001A - General Chemistry - Use technology, including computers and the web, to analyze atomic and molecular structure. (Active)

MATH 066 - Calculus I Late Transcendentals for STEM - Compute and interpret limits of a function using analytic and other techniques when they exist; when limits do not exist, give reasons why for their non-existence. (Active)

MATH 066 - Calculus I Late Transcendentals for STEM - Compute derivatives using limit, differentiation formulas, and implicit differentiation. (Active)

MATH 066 - Calculus I Late Transcendentals for STEM - Apply the definition of continuity to determine whether or not a function is continuous at a real number. (Active)

MATH 066 - Calculus I Late Transcendentals for STEM - Apply differential calculus to sketch the graph of a function, to obtain the equation of the tangent line to a function, and to solve applications such as optimization and related rate problems. (Active)

MATH 066 - Calculus I Late Transcendentals for STEM - Evaluate the definite integral using the limit of Riemann Sum, and using the Fundamental Theorem of Calculus. (Active)

MATH 066 - Calculus I Late Transcendentals for STEM - Use the definite integral to find areas and volumes. (Active)

MATH 067 - Calculus II Late Transcendentals for STEM - Evaluate definite, indefinite, and improper integrals using a variety of integration formulas and techniques. (Historical)

MATH 067 - Calculus II Late Transcendentals for STEM - Find the derivative of transcendental functions. (Historical)

MATH 067 - Calculus II Late Transcendentals for STEM - Evaluate indeterminate forms using l'Hospital's Rule. (Historical)

MATH 067 - Calculus II Late Transcendentals for STEM - Apply integrals and differential equations to problems such as volumes, arc length of a curve, area of a surface of revolution, center of mass, and population dynamics. (Historical)

MATH 067 - Calculus II Late Transcendentals for STEM - Apply divergence and convergence tests to sequences and series, and represent functions as power series using different techniques including the Taylor theorem. (Historical)

- MATH 067 - Calculus II Late Transcendentals for STEM - Graph and analyze functions in polar and parametric forms, and solve problems by differentiating and integrating such functions. (Historical)
- MATH 072 - Calculus II with Analytic Geometry - Evaluate definite, indefinite, and improper integrals using a variety of integration formulas and techniques. (Rejected)
- MATH 072 - Calculus II with Analytic Geometry - Evaluate definite, indefinite, and improper integrals using a variety of integration formulas and techniques. (Historical)
- MATH 072 - Calculus II with Analytic Geometry - Apply integrals and differential equations to problems such as areas, volumes, arc lengths, work, and population dynamics. (Historical)
- MATH 072 - Calculus II with Analytic Geometry - Apply integrals and differential equations to problems such as areas, volumes, arc lengths, work, and population dynamics. (Rejected)
- MATH 072 - Calculus II with Analytic Geometry - Graph and analyze functions in polar and parametric forms, and solve problems by differentiating and integrating such functions. (Historical)
- MATH 072 - Calculus II with Analytic Geometry - Graph and analyze functions in polar and parametric forms, and solve problems by differentiating and integrating such functions. (Rejected)
- MATH 072 - Calculus II with Analytic Geometry - Apply divergence or convergence tests to sequences and series, and represent functions as power series using different techniques including the Taylor theorem. (Rejected)
- MATH 072 - Calculus II with Analytic Geometry - Apply divergence or convergence tests to sequences and series, and represent functions as power series using different techniques including the Taylor theorem. (Historical)
- MATH 073 - Multivariable Calculus - Perform vector operations including vector addition, scalar multiplication, the dot product, and the cross product to find triple products, projections, and the equations of lines, curves, planes and surfaces in space. (Historical)
- MATH 073 - Multivariable Calculus - Analyze multivariable functions and space curves including their graphs; find level curves and level surfaces; find velocity and acceleration pertaining to motion in space; find the arc length and curvature of a curve; and find the unit tangent, unit normal, and unit binormal vectors for a space curve. (Historical)
- MATH 073 - Multivariable Calculus - Determine differentiability; find limits, partial derivatives, directional derivatives, gradient vectors, and differentials of multivariable functions; and find an equation of the tangent plane to a surface at a given point. (Historical)
- MATH 073 - Multivariable Calculus - Find global extrema of a continuous multivariable function on a closed and bounded set; apply the second derivative test to find local extrema and saddle points; and apply the Lagrange multiplier method to solve constrained optimization problems. (Historical)
- MATH 073 - Multivariable Calculus - Set up and evaluate double integrals in rectangular and polar coordinates and triple integrals in rectangular, cylindrical, and spherical coordinates; apply the change of variables theorem for multiple integrals; and apply multiple integration to find volumes, surface areas, centers of mass, moments of inertia, and probabilities using joint probability density functions. (Historical)
- MATH 073 - Multivariable Calculus - Determine whether a vector field is conservative; find a potential function for a conservative vector field; find the divergence and curl of a vector field; evaluate line integrals using parameterized curves; evaluate surface integrals using parameterized surfaces; and apply the Fundamental Theorem for Line Integrals, Green's Theorem, Stokes' Theorem, and the Divergence Theorem to a variety of science and engineering examples. (Historical)
- PHYS 004A - General Physics - Solve problems involving accelerated motion using equations of kinematics. (Active)
- PHYS 004A - General Physics - Solve problems involving accelerated motion using equations of kinematics. (Active)
- PHYS 004A - General Physics - Solve problems involving accelerated motion using equations of kinematics. (Active)

- PHYS 004A - General Physics - Predict the position and velocity of an object if all external forces acting on it are known. (Active)
- PHYS 004A - General Physics - Predict the position and velocity of an object if all external forces acting on it are known. (Active)
- PHYS 004A - General Physics - Predict the position and velocity of an object if all external forces acting on it are known. (Active)
- PHYS 004A - General Physics - Predict the position and speed of an object subjected to conservative and non-conservative forces. (Active)
- PHYS 004A - General Physics - Predict the position and speed of an object subjected to conservative and non-conservative forces. (Active)
- PHYS 004A - General Physics - Predict the position and speed of an object subjected to conservative and non-conservative forces. (Active)
- PHYS 004A - General Physics - Analyze the motion of rolling and spinning masses. (Active)
- PHYS 004A - General Physics - Analyze the motion of rolling and spinning masses. (Active)
- PHYS 004A - General Physics - Analyze the motion of rolling and spinning masses. (Active)
- PHYS 004A - General Physics - Employ the principle of the harmonic oscillator to solve more complex systems such as vibrating molecules. (Active)
- PHYS 004A - General Physics - Employ the principle of the harmonic oscillator to solve more complex systems such as vibrating molecules. (Active)
- PHYS 004A - General Physics - Employ the principle of the harmonic oscillator to solve more complex systems such as vibrating molecules. (Active)
- PHYS 004A - General Physics - Apply the concepts of gravitational force and potential energy to predict the trajectory of objects. (Active)
- PHYS 004A - General Physics - Apply the concepts of gravitational force and potential energy to predict the trajectory of objects. (Active)
- PHYS 004A - General Physics - Apply the concepts of gravitational force and potential energy to predict the trajectory of objects. (Active)
- PHYS 004A - General Physics - Apply Archimedes law to calculate the fraction of a floating object partially submerged. (Active)
- PHYS 004A - General Physics - Apply Archimedes law to calculate the fraction of a floating object partially submerged. (Active)
- PHYS 004A - General Physics - Apply Archimedes law to calculate the fraction of a floating object partially submerged. (Active)
- PHYS 004B - General Physics - Solve real world problems involving electricity and magnetism. (Historical)
- PHYS 004B - General Physics - Solve real world problems involving electricity and magnetism. (Rejected)
- PHYS 004B - General Physics - Solve real world problems involving electricity and magnetism. (Active)
- PHYS 004B - General Physics - Solve real world problems involving electricity and magnetism. (Active)
- PHYS 004B - General Physics - Calculate electric fields and electric potentials produced by simple charge distributions. (Active)
- PHYS 004B - General Physics - Calculate electric fields and electric potentials produced by simple charge distributions. (Active)
- PHYS 004B - General Physics - Calculate electric fields and electric potentials produced by simple charge distributions. (Rejected)
- PHYS 004B - General Physics - Calculate electric fields and electric potentials produced by simple charge distributions. (Historical)
- PHYS 004B - General Physics - Apply the principle of conservation of energy to determine the trajectory of a charge moving in an electric and magnetic fields. (Historical)
- PHYS 004B - General Physics - Apply the principle of conservation of energy to determine the trajectory of a charge moving in an electric and magnetic fields. (Rejected)

- PHYS 004B - General Physics - Apply the principle of conservation of energy to determine the trajectory of a charge moving in an electric and magnetic fields. (Active)
- PHYS 004B - General Physics - Apply the principle of conservation of energy to determine the trajectory of a charge moving in an electric and magnetic fields. (Active)
- PHYS 004B - General Physics - Determine voltages, currents, and power dissipated in different components of an AC/DC circuit. (Active)
- PHYS 004B - General Physics - Determine voltages, currents, and power dissipated in different components of an AC/DC circuit. (Active)
- PHYS 004B - General Physics - Determine voltages, currents, and power dissipated in different components of an AC/DC circuit. (Rejected)
- PHYS 004B - General Physics - Determine voltages, currents, and power dissipated in different components of an AC/DC circuit. (Historical)
- PHYS 004B - General Physics - Calculate the induced voltage generated by simple distributions of varying currents and moving magnets. (Historical)
- PHYS 004B - General Physics - Calculate the induced voltage generated by simple distributions of varying currents and moving magnets. (Rejected)
- PHYS 004B - General Physics - Calculate the induced voltage generated by simple distributions of varying currents and moving magnets. (Active)
- PHYS 004B - General Physics - Calculate the induced voltage generated by simple distributions of varying currents and moving magnets. (Active)
- PHYS 004C - General Physics - Solve real world problems involving propagation of light and heat. C-ID # 1; Lab #1 (Active)
- PHYS 004C - General Physics - Solve real world problems involving propagation of light and heat. C-ID # 1; Lab #1 (Active)
- PHYS 004C - General Physics - Predict the transfer of heat among materials. C-ID Lab # 2 (Active)
- PHYS 004C - General Physics - Predict the transfer of heat among materials. C-ID Lab # 2 (Active)
- PHYS 004C - General Physics - Analyze the physical propagation of light through different media, by drawing light ray diagrams characteristics of reflection and refraction. C-ID # 1; Lab #1 (Active)
- PHYS 004C - General Physics - Analyze the physical propagation of light through different media, by drawing light ray diagrams characteristics of reflection and refraction. C-ID # 1; Lab #1 (Active)
- PHYS 004C - General Physics - Analyze the phenomena of interference and diffraction in optics, predicting patterns produced by narrow slits: single, double and multiple. C-ID # 2; Lab #1 (Active)
- PHYS 004C - General Physics - Analyze the phenomena of interference and diffraction in optics, predicting patterns produced by narrow slits: single, double and multiple. C-ID # 2; Lab #1 (Active)
- PHYS 004C - General Physics - Explain how Relativity and Quantum Mechanics changed our view of the physical world. C-ID # 3, 4 (Active)
- PHYS 004C - General Physics - Explain how Relativity and Quantum Mechanics changed our view of the physical world. C-ID # 3, 4 (Active)
- PHYS 007A - Calculus - Based General Physics for Scientists and Engineers - I - Predict the position and velocity of an object moving through space and subject to a range of conservative and nonconservative forces. (Draft)
- PHYS 007A - Calculus - Based General Physics for Scientists and Engineers - I - Predict the dynamic evolution of a system subject to an arrangement of conservative and conservative forces. (Draft)
- PHYS 007A - Calculus - Based General Physics for Scientists and Engineers - I - Report the uncertainties of physical quantities unveiled in lab exercises, with special care on displaying reasonable number of significant figures. (Draft)
- PHYS 007A - Calculus - Based General Physics for Scientists and Engineers - I - Apply the principles of work, energy and momentum conservation in situations involving the motion of bodies in two or three dimensions, in interacting spinning systems, and in fluid dynamics. (Draft)

PHYS 007A - Calculus - Based General Physics for Scientists and Engineers - I - Develop an original project that illustrates principles or laws of classical mechanics, including public presentation of such project. (Draft)

Program Learning Outcomes

Engineering - Associate in Arts: Associate in Arts - Design and conduct experiments as well as analyze and interpret data (In Review)

Engineering - Associate in Arts: Associate in Arts - Design a system, component, or process as per customer specifications (In Review)

Engineering - Associate in Arts: Associate in Arts - Identify potential changes in behavior and properties of materials as they are altered and influenced by manufacturing processes and loading conditions (In Review)

Engineering - Associate in Arts: Associate in Arts - Assess the safety and environmental consequences of a proposed design (In Review)

Engineering - Associate in Arts: Associate in Arts - Demonstrate an awareness of the human and social ramifications of technological solutions in a global and societal context (In Review)

Engineering - Associate in Arts: Associate in Arts - Work and communicate effectively, either independently or in a team, to solve technical problems using engineering principles (In Review)

Engineering - Associate in Arts: Associate in Arts - Demonstrate an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (In Review)

- **1. On the program level, defined as a course of study leading to degree or certificate, list the Program Learning Outcomes (PLOs), and how they relate to the GE/ILOs. Please also indicate how the course SLOs have been mapped to the PLOs. If you are completing this program review as a department or discipline and do not offer any degrees or certificates, please write N/A in this space.**

The department's PLOs are mapped to ILOs and course-level SLOs as indicated below:

1. Design and conduct experiments as well as analyze and interpret data
 - ILOs Mapped at the program level:
 - Communication
 - Social Responsibility
 - Personal Development
 - SLOs Mapped at the course level
 - Engr. 10 "Engineering Processes and Tools"
 - SLO 1: Perform engineering data analysis with Matlab and Excel
 - SLO 2: Solve engineering problems using engineering design methodology.
 - Engr. 66 "Properties of Materials"
 - SLO 2: Determine the hardness and toughness of materials.
 - SLO 3: Assess the impact of heat treatment on the properties of materials.
 - SLO 4: Evaluate various properties of polymers, metals, and other materials.
 - Engr. 71 "Introduction to Circuit Analysis"
 - SLOs 1 to 5
2. Design a system, component, or process as per customer specifications.
 - ILOs Mapped at the program level:
 - Communication
 - Social Responsibility
 - Personal Development
 - SLOs Mapped at the course level

- Engr. 18 "Engineering Design and Graphics"
 - SLO 1: Use CAD software to create 2D engineering drawings including working drawings and assembly drawings, and 3D models and assemblies.
 - SLO 3: Apply standards of dimensioning and tolerancing to engineering drawings. Apply the engineering design process to a design project
 - Engr. 50 "Introduction to Computing"
 - SLOs 1 to 5
3. Identify potential changes in behavior and properties of materials as they are altered and influenced by manufacturing processes and loading conditions
- ILOs Mapped at the program level:
 - Communication
 - Social Responsibility
 - Personal Development
 - SLOs Mapped at the course level
 - Engr. 66 "Properties of Materials"
 - SLO 2: Determine the hardness and toughness of materials.
 - SLO 3: Assess the impact of heat treatment on the properties of materials.
4. Assess the safety and environmental consequences of a proposed design
- ILOs Mapped at the program level:
 - Communication
 - Social Responsibility
 - Personal Development
 - SLOs Mapped at the course level
 - Engr. 66 "Properties of Materials"
 - SLO 5: Perform corrosion analysis of various materials.
5. Demonstrate an awareness of the human and social ramifications of technological solutions in a global and societal context
- ILOs Mapped at the program level:
 - Communication
 - Social Responsibility
 - Personal Development
 - SLOs Mapped at the course level
 - Engr. 10 "Engineering Processes and Tools"
 - SLO 5: Critically analyze engineering design impacts on society, the environment, and economics.
 - Engr. 66 "Properties of Materials"
 - SLO 4: Evaluate various properties of polymers, metals, and other materials.
6. Work and communicate effectively, either independently or in a team, to solve technical problems using engineering principles.
- ILOs Mapped at the program level:
 - Communication
 - Social Responsibility
 - Personal Development
 - SLOs Mapped at the course level
 - Engr. 10 "Engineering Processes and Tools"
 - Teamwork in lab experiments
 - Engr. 18 "Engineering Design and Graphics"
 - Teamwork in lab experiments

- Engr. 50 "Introduction to Computing"
 - Teamwork in lab experiments
 - Engr. 66 "Properties of Materials"
 - Teamwork in lab experiments
 - Engr. 69 "Statics"
 - Teamwork in in-class design and discussion
 - Engr. 71 "Introduction to Circuit Analysis"
 - Teamwork in lab experiments
7. Demonstrate an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
- ILOs Mapped at the program level:
 - Communication
 - Social Responsibility
 - Personal Development
 - SLOs Mapped at the course level
 - Engr. 10 "Engineering Processes and Tools"
 - Use of lab equipment, apparatus, and devices
 - Engr. 18 "Engineering Design and Graphics"
 - Use of lab computers and associated CADD software
 - Engr. 50 "Introduction to Computing"
 - Use of lab equipment, apparatus, and devices
 - Engr. 66 "Properties of Materials"
 - Use of lab equipment, apparatus, and devices
 - Engr. 71 "Introduction to Circuit Analysis"
 - Use of lab equipment, apparatus, and devices
- **2. Since your last program review, summarize SLO assessment activities and results at the course and program level. Please include dialogue regarding SLO Assessment results with division/department/college colleagues and/or GE areas. Provide evidence of the dialogue (i.e. department meeting minutes or division meeting minutes, etc.) List any SLOs or PLOs that have not been assessed in the last two years and provide an explanation of why they have not been assessed. This will be reviewed by the IEC to determine if your Program Review is approved or not.**

All the SLOs and PLOs have been assessed over the last few years. Reporting the last round of assessments has been through the current Curriqunet system. Prior assessments were reported in pdf forms.

The current assessment was done after we came back from the COVID-19 school shutdown. Classes were held online in their entirety. Unfortunately, students were not able to get the necessary hands-on training that we usually provide during the labs. In addition, students, unfortunately, lost their study skills during this time. Based on what students are sharing, it turns out that the level of learning that happened during online classes was very low. All of this impacted our students negatively. It should be pointed out that our engineering program relies on preparatory courses such as math, physics, and chemistry.

Assessment activities, implementation, discussions, and reporting details were regularly discussed, as needed, with the department associate faculty. I teach all of the courses in engineering with the exception of one course, Engr. 18 which is taught by Dr. Entekhabi. We have an additional section of

our Engr. 10 taught by another associate faculty member, Dr. Zaidi. The needed improvements or modifications have been incorporated over the years. No meeting minutes are available since there is only me as the full-time faculty member and two other associate faculty members. I generally contact them and discuss SLO-related matters. The excerpt below is one of my emails to an associate faculty member. Most of the time, our discussion takes place before these two associate faculty members start their classes.

*****Copy of email*****

Tabrizi, Abdie H.

To:

'Parviz Entekhabi' <pentekhabi@hartnell.edu>

+1 other

Fri 11/5/2021 11:31 AM

Hi,

Could you please send me your assessment results for the SLOs in your course? Per SLO item, report how students performed (passing rate, etc.. Any issues that need to be addressed, and if any intervention is needed, what would be your plan and how you will implement it, and when). Please give me as many SLOs as you can. Thanks.

Abdie

*****Copy of email*****

Tabrizi, Abdie H.

To:

Syed Zaidi <sohailhzaidi@gmail.com>

Tue 5/22/2018 10:45 AM

Hi,

We need to sit down and get the assessment result inputted into the SLO matrix. We can do this after the semester is over. Thanks.

Abdie

Assessment Summary at the course level:

Engr. 001"Technology and Society":

This is a GE course meeting area D - life sciences requirements. Students are able to satisfy all the SLOs at 70% or higher levels. The mastery level for all SLOs was set at 70%.

Engr. 010 "Engineering Processes and Tools":

This is our introduction to the engineering class. The level of mastery was 70%. Each lab experiment requires a written report. It was noted that some of our students lacked skills in producing these reports. However, we have been able to help the students by providing additional training and information. The mastery level for all SLOs was set at 70%.

Engr. 018 "Engineering Design and Graphics":

This course is primarily a hands-on CADD class and success was at 80% and over. The availability of free CADD software for students was also helpful. The mastery level for all SLOs was set at 70%.

Engr. 050 "Introduction to Computing":

Out of five SLOs, only in one SLO, 10% of the students had trouble demonstrating consistent understanding and application. This SLO is about pointers and arrays. So additional training on this topic is planned. The mastery level for all SLOs was set at 70%.

Engr. 066:

Out of five SLOs, only in one SLO, 15% of the students had difficulty demonstrating their knowledge. This SLO is about the topic of corrosion, which is covered at the very end of the semester. So this semester (Fall 2022) I have added an additional session that included problem-solving in this area. We will see the impact of this intervention in later assessments. All the other SLOs showed anywhere between 3 to 10% deficiency. The mastery level for all SLOs was set at 70%.

Engr. 069:

Out of five SLOs, in one SLO, less than 11% of the students showed difficulty in mastering the topic of the moment of inertia. To help improve this outcome, even though this course does not have a lab component, I am planning on a few hands-on in-class activities. In another SLO on the topic of centroids, less than 10% of the students had problems with performing integration to obtain the centroid of a plane. This is, unfortunately, due to the lack of prior preparation in the calculus I (Math 71) class. The mastery level for all SLOs was set at 70%.

Engr. 071:

A total of five SLOs have been created for this course. This course was assessed immediately after we came back to face-to-face in-class sessions. This course has very high math and physics prerequisites (Calculus III/Differential Equation and Physics 4B) requirements. There was a substantial lack of prior student preparation! Two of the SLOs showed about 15% of the students had difficulty mastering the subjects assessed. One of the SLOs showed about 10% of the students lacked mastery. The mastery level for all SLOs was set at 70%.

Assessment summary at the program level:

The engineering program includes a total of seven PLOs. These PLOs contain topics from each one of the contributing courses in the program. Some of the topics such as the use of laboratory equipment, communication, and technical writing are common to all of the courses in the program. The PLOs are mapped to the program courses as well as to the ILOs. Due to the nature of the subject area and activities, all of our PLOs are mapped to three ILOs, i.e. Communication, social responsibility, and personal development.

All lab experiments in the program require written reports. Emphasis is given to the way in which each activity is communicated, and not just reporting experimental results. Actually, in our introduction class, Eng. 10, one week of the semester is devoted to discussing technical communication. By the time students are ready to transfer to four-year schools, students are able to show competency in technical reporting.

Social responsibility as it applies to being able to work with colleagues and being environmentally conscious is constantly discussed and practiced. In Engr. 10 and Engr. 66, environmental issues are discussed.

Personal development as applied to learning and gaining educational experience to enhance future career opportunities are focal points of the engineering program at EVC. Almost all of our students transfer to universities. This is indicative of the fulfillment of this particular ILO.

- **3. What plans for improvement have been implemented to your courses or program as a result of SLO assessment? Please share one or two success stories about the impacts of SLO assessment on student learning.**

Technical communication in engineering is as important as technical knowledge. This has always been a problem with our students as well as engineering graduates. The industry has always complained about the lack of this skill set from their new hires. All of our courses have a laboratory component and a technical report is required for each experiment. Based on assessments, we have incorporated additional training in technical reporting. In the fall of 2020, we also participated in a grant-funded training session to provide hands-on training in technical research and reporting in our Engr. 10 "Engineering Processes and Tools". This was a grant from the federal government. We have continued the training since then and we have seen improvements. This improvement has been observed over the program level.

At the course level, one of the major impacts as a result of the assessment was on our Engr. 50 "Introduction to Computing" class. In this course, engineering problems are solved using C++ programs. So students are taught C++ language. Learning a language requires a lot of practice. So with the availability of our CMS system, canvas, we have been able to provide many examples, practice problems, and class lecture examples for the students. This has helped our students.

Faculty and Staff

Part D: Faculty and Staff

- **1. List current faculty and staff members in the program, areas of expertise, and describe how their positions contribute to the success of the program.**

Faculty:

1. Abdie Tabrizi (Full-time)

Dr. Tabrizi holds BS, MS, and PhD. degrees in mechanical engineering. He has over 45 years of teaching experience at many universities and colleges. He has also worked at NASA, General Motors, and served as a consultant for local industry. He is the former dean of math, science, and engineering at EVC.

He has constantly updated the engineering program to stay current with the changes in industry as well as the changes at the transfer schools. He has and continues to create unique laboratory experiments that will improve students' skills and understanding of the subjects. Due to his involvement in various school committees and functions, he has always been able to acquire resources for the program.

He created SLOs for each course and assessed them over the years. He created the program PLOs and assessed them. The program enjoys a full enrollment and it is the only engineering program in the Bay Area that has not canceled any sections. He is involved with the design of the facilities for the engineering program in the new general education building.

2. Parviz Entekhabi (Adjunct)

Dr. Entekhabi holds a PhD in manufacturing and technology. He has been a full-time engineering faculty member at Hartnell College for over 25 years. He has been teaching our Engr. 18 "Design and Graphics" for about 25 years. He has been involved with developing the course and staying current with the required software. He has also started a hybrid section of this course to make it easier for the students to attend his lectures. He has also been teaching a stem section of this course which was grant funded.

Students in our Engr 18 learn about the design and production of engineering drawings. Dr. Entekhabi is an expert in CADD (Computer Aided Design & Drafting) and brings his skills to the classroom. His students also present their designs, thus satisfying one of our school's ILO's, namely Communications.

He has been active in assessing the established SLOs for this course.

3. Syed Zaidi (Adjunct)

Dr. Zaidi holds a PhD in Mechanical Engineering. He has worked as a research engineer at Princeton University and has been teaching at SJSU for over 10 years. He has been teaching one section of our Engr. 10 "Engineering Process and Tools" for about five years. His section is offered in the evenings to allow additional access opportunities for our students.

Engr. 10 is our introduction class in engineering where students are introduced to the various activities that engineers are involved in. Teaching this class requires a comprehensive knowledge of the engineering discipline and it is important that it is done properly. Retaining students in the program to a certain degree depends on this initial exposure to the field of engineering. Students enjoy Dr. Zaid's years of experience in theoretical and experimental activities through his lectures and laboratory work. It is important to note that engineering education requires hands-on training which is provided through laboratory experiments. So, access to equipment and lab activities improves students' success in the program and their ultimate career.

Staff:**1. Mr. Antonio Perez**

Mr. Perez is our part-time lab technician. He is a retired technician from IBM. He has been working for us for about 13 years. He has been super involved with our laboratory upkeep! Many of the experiments that I have designed were fabricated in-house to save money. He is very capable and very generous with his time and help and goes well beyond his duties. I must say that without his help, our labs would not be what they are today. I constantly revise and create new experiments and without Mr. Perez's experience and capability, I would not have been able to realize these new experiments.

Without a doubt, Mr. Preze has been a valuable asset to our engineering program and our students are the recipient of our excellent laboratory experience.

- **2. In addition to major professional development activities completed by faculty and staff in the past, in particular with regards to students' success, equity, distance education, SLO assessment, guided pathways and/or innovative teaching/learning strategies, are there any additional professional development needs of your department in the future? What are they? Please provide details about a timeline.**

Engineering education is a dynamic process and it has to be constantly revised to address the latest in technology. This program requires hands-on experience. All the labs must be constantly updated either by acquiring new equipment and/or modifying the old. This requires knowledgeable and dedicated staff and, of course, a lot of funding. Unfortunately, funding that we used to receive has been cut in the last five years. The current faculty and the lab technician have been spending many hours repairing the old equipment. Some of our equipment is over 50 years old. They were actually moved from SJCC to EVC.

In about 2.5 years, we will be moving into a new facility in the General Education building. We were hoping that we would get some new equipment, but unfortunately that will not be happening due to inflation and other cost over-runs. To insure that this program maintains its effectiveness, EVC needs to provide funding by 2024.

In addition, the current full-time faculty will be retiring soon, so we need to hire a replacement as soon as possible.

Budget Planning

Part E: Budget Planning

- **1. With your Dean, review the department Fund 10 budget (operational budget) and discuss the adequacy of the budget in meeting the program's needs.**

The department fund 10 budget provides for

1. One full-time member
2. One half-time technician
3. two associate faculty

Last month, I requested a full-time faculty member to be hired. Our engineering program had two full-time faculty in the past, but about 13 years ago, when one of the full-time faculty left, we never replaced his position. The currency of our program will depend on the availability of full-time faculty within the program. It should be noted that this program is a transfer program and we must maintain articulation with the transfer schools at all times. So having enough full-time faculty is a must.

The following fund-10 budget is needed:

1. To improve retention, a budget line item should be added. In the past, we did have a \$3600.00 fund-10 for this purpose, but it was cut a few years ago. As was mentioned earlier, our students need tutoring that is different from what the school currently provides through the tutoring center. We need to hire tutors from SJSU.
 2. Need a line item budget for repair. In our engineering laboratories, we have a lot of equipment that needs to be maintained constantly. I have done most of the repairs by myself for many years. Mr. Perez has also been repairing much of the equipment. However, due to the aging of the equipment and not being able to replace them due to the lack of funds, we must be able to repair them, if possible. I pointed out that some of our equipment are over 50 years old!
- **2. List all external funds, i.e. fund 17, the department/program receives, and describe their primary use.**
 1. In the past, I was able to get some VTEA funds (federal funds). However, this money was taken away by the new dean who was assigned to oversee the funds (this dean is no longer at EVC). The lack of access to these funds resulted in not offering our newly created certificate program in Robotics, which is part of our engineering technology.
 2. Currently, we are getting some lottery funds (22500). This fund has replaced our department's fund-10 supply budget. We also used to charge \$5.00 lab fees and it was discontinued at the request of the school. So the lottery fund is the only money we get to run the laboratories. These funds are used for:
 - Consumable
 - Instructional supplies
 - Non-instruction supplies for the labs
 - Components for the circuit analysis lab (capacitors, inductors, amplifiers, resistors, etc.)
 - Components for the Engineering Processes & Tools (solar cells, motors, wires, batteries, connectors, and many others)
 - Software
 - Measuring devices such as volt meters, ammeters, sensors, etc.
 - Metals, pipes, wood, screws, nuts, and fittings for constructing lab experiments
 - Many specimens, such as tensile, torsion, compression, corrosion, etc.

We are requesting an increase in our operating budget, from \$4K to \$6K, to adequately stay current with the program needs and make sure our students are getting what their colleagues are getting at the universities. We must make sure our students are competitive upon transferring to four-year

schools.

Technology and Equipment

Part F: Technology and Equipment

- **Review the current department technology and equipment needed and assess program adequacy. List and changes to technology or equipment since the last program review. If changes were made please indicate how the change impacted student success.**

There is some technology and equipment needed in engineering to stay competitive with the four-year schools. As was mentioned earlier, some of our equipment is over 50 years old. However, since the last program review, we have added a small torsion test which is used for testing plastic specimens. This has greatly helped our students to understand the torsional properties of plastic material. We have also added 10 tables that have helped in acquiring data from the thermal expansion, corrosion, and phase change experiments. However, these are low-power tablets and need replacement.

Computer lab:

Our computers in the engineering computer lab are over four years old. It is hoped that these will be replaced by the time we move into the new facility in about two years. Our engineering classes depend on these computers. In addition, our Engr 50 (computer class) and 18 (design & graphics) classes use these as the only means of instruction.

1. One-time cost: \$50k (replace computer lab systems)
2. On-going cost: Purchase software subscription for Matlab (every two years) \$4k

Properties of Materials lab:

This lab requires a lot of equipment to conduct the experiments effectively. Here is the list:

- Tensile, Torsion, and Impact testers are over 50 years old. Even though we have tried to repair them over the years, they should be updated. As mentioned earlier, the department has no repair budget (fund 10). Repairs have been done by me and our technician, but there is only so much we can do.
 - There is also a need for a large display monitor to present the lab data to the students in real time.
 - There is also a need to replace the aging computers in this lab. These computers are used to run experiments every week.
 - The lab microscopes need to be updated. Out of three microscopes, only one is currently able to acquire the digital images needed for the metallography experiment.
 - There is a need for a proper projector/projection system. At the current time, we have a very old and low-power projector with an old screen. Definitely not suitable for this lab.
 - Low-powered tablets need to be replaced.
1. Calibrate Tensile, Torsion, Impact, and hardness testers \$6k (one-time cost)
 2. Purchase a new metallurgical microscope for \$15k (one-time cost)
 3. Purchase calibration/certification contract (every two years) \$5k (ongoing cost)

4. Upgrade 65-year-old Torsion tester to acquire electronic data \$25k (one-time cost)
5. Upgrade 65-year-old Tensile tester to acquire electronic data \$25k (one-time cost)
6. Upgrade 12-year-old low load impact tester to acquire electronic data \$15k (one-time cost)
7. Repair Metkon metallographic specimen mounting system \$3k (one-time cost)
8. Replace the 65-year-old belt sander \$3k (one-time cost)
9. Purchase three digital cameras with software for the microscopes for \$15k (one-time cost)
10. Repair the 65-year-old tensile tester \$2k (one-time cost)

Circuits lab:

- A computer projection system is needed in this lab. Currently, we have an old low-power projector that is not meeting the needs of this lab.

1. \$4k (one-time cost)

General Engineering lab:

This lab was a retrofit of the old automotive lab. It lacks many things. It does require electrical outlets needed for each table. However, hopefully, the new facility will have adequate power outlets.

1. Upgrade Windlab software \$3k (one-time cost)

General Supply expenses:

1. Establish/reinstate the yearly supply budget of \$4k (ongoing cost)
2. Reinstate the old tutoring budget of \$4.5k (ongoing cost)

Additional Information

Part G: Additional Information

- **Please provide any other pertinent information about the program that these questions did not give you an opportunity to answer.**

Program-specific Counseling:

The engineering program relies heavily on math, physics, and chemistry classes. In addition, our students transfer to many different majors within engineering. By the time an AA degree in engineering is completed, students have earned over 90 units. Thus, proper counseling is needed to make sure students are on track without loss of time. This requires proper counseling. We are suggesting that our counseling department assign a specific counselor to the engineering department, as we used to have in the past. This will also allow the engineering faculty to work closely with the counselor and communicate any changes that the transfer schools make to their programs.

Unfortunately, the new engineering facility that is being built recently is smaller than what we have presently. In addition, we have also lost our computer room, as was mentioned earlier. We are requesting that one of the rooms on the second floor of the new building, the general education building, be assigned to engineering as a computer lab.

Future Needs and Resource Allocation Request

Based on the areas noted below, please indicate any unmet needs for the program to maintain or build over the next six years. Please provide rationale on how the request connects back to SLO/PLO assessment, strategic initiatives or student success. If no additional requests are needed in any of the areas, put N/A.

1. Faculty Request

Ongoing Budget Needs

\$175K

One-Time Expenditure

Total Expenses (Staffing and Faculty Requests include Salary and Benefits)

175000.000

Request linked to SLO/PLO

PLO: 1 to 5

Total Cost

Strategic Initiatives (student centered, organizational transformation, community engagement)

Yes

Improving Student success rates

Yes

Achievement of program set standard for student success

Yes

2. Facilities

Ongoing Budget Needs

One-Time Expenditure

\$20,000

Request linked to SLO/PLO

PLO: 1 to 5

Total Cost

Strategic Initiatives (student centered, organizational transformation, community engagement)

Yes

Improving Student success rates

Yes

Achievement of program set standard for student success

Yes

3. Equipment/Supplies

Ongoing Budget Needs

\$17.5k

One-Time Expenditure

\$118.5k

Request linked to SLO/PLO #

PLO: 1-5

Total Cost**Strategic Initiatives (student centered, organizational transformation, community engagement)**

Yes

Improving Student success rates

Yes

Achievement of program set standard for student success

Yes

4. **Technology****Ongoing Budget Needs****One-Time Expenditure**

\$50K

Request linked to SLO/PLO #

PLO: 1-5

Total Cost**Strategic Initiatives (student centered, organizational transformation, community engagement)**

Yes

Improving Student success rates

Yes

Achievement of program set standard for student success

Yes

Attach Files

Attached File

Program_Review_EVC_ENGR_f2f.xlsx (/Form/Module/_DownloadFile/2660/41960?fileId=267)

Engineering Program Review 2015-16-Final_March2016.pdf (/Form/Module/_DownloadFile/2660/41960?fileId=269)

Articulation_Agreement_MHS.pdf (/Form/Module/_DownloadFile/2660/41960?fileId=270)

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