ANNUAL PROGRAM REPORT

College	College of Science
Department	Engineering
Program	Computer Engineering
Reporting for Academic Year	2023-2024
Last 5-Year Review	2022-2023
Next 5-Year Review	2026-2027
Department Chair	Farnz Ganjeizadeh
Author of Review	James Tandon
Date Submitted	

I. SELF-STUDY *(suggested length of 1-2 pages)*

A. Five-Year Review Planning Goals

Present your planning goals from your last 5-year plan.

1. Summary of program changes: The computer engineering was formally assessed for ABET accreditation in 2021-2022. The department met the needs of accreditation and continues to fulfill the needs of the students. A review of the courses required for graduation found that the course dependencies in the Computer Engineering major required students to take a minimum of 3.5 years prior to graduation. Students who need remediation or who do not follow the program roadmap precisely will be held back for extra years at the university. In order to alleviate this concern we plan to modify the course prerequisites and adapt course materials to ensure that students can have a shorter time to graduation. This will help us to meet our targets for the 2025 graduation initiative.
2. Program learning outcomes: As mentioned in the ABET review, we have to address their concern before the next visit.
3. Research: The Computer Engineering faculty are active in research and are being successful in securing funds for their research. Growth in research is a goal that the engineering faculty are aggressively pursuing.
4. Laboratory Development: Engineering is being allocated space for faculty research and teaching in the Applied Sciences Building. The space is going to be utilized for the development of an electronics laboratory, which will contain high-speed RF equipment that will allow students to complete state-of-the-art circuits. Two computer engineering faculty will be using this lab to conduct research and support their classes.
5. Equipment: Through A2E2 annual funding and other College of Science resources, we will purchase lab equipment that will partially be used to equip this space.
6. Growth: Computer Engineering program was the fastest growing undergraduate program in Engineering but enrollment dropped when the COVID pandemic hit. We anticipate that the growth will return and make it viable to start offering a graduate program in computer engineering.

B. Progress Toward Five-Year Review Planning Goals

Report on your progress toward achievement of the 5-Year Plan. Include discussion of problems reaching each goal, revised goals, and any new initiatives taken with respect to each goal.

1. We have addressed the program learning outcomes weakness mentioned in the ABET review by working with the industry advisory board to
2. Faculty have created a Computer Engineering research program whitepaper which we distributed to donors in Silicon Valley and to companies at large. This is to help increase investment in our program from industry. Based on this whitepaper, we have received funding from industry for our senior design program. Faculty continue to aggressively pursue a research agenda and publish papers.

3. Both Dr. Tandon and Dr. Sumarsono have successfully published their research at multiple conferences and in multiple journal articles. Additionally Dr. Doering has continued to develop his free chip design and his free MIPS simulator tools such that students in the Computer engineering program may continue to use quality software for free.
4. The COVID19 pandemic caused student enrollment to drop by approximately 15% but enrollment is down across all majors. As students return to campus, we expect the program to increase enrollment faster than other programs in the engineering department. We are developing a plan to perform recruitement

C. Program Changes and Needs

Report on changes and emerging needs not already discussed above. Include any changes related to SB1440, significant events which have occurred or are imminent, program demand projections, notable changes in resources, retirements/new hires, curricular changes, honors received, etc., and their implications for attaining program goals. Organize your discussion using the following subheadings.

Overview: The most significant change was the reorganization of course prerequisites. Due to the unreasonably long time to graduation due to the course requirements, We noticed this deficiency and figured out that some of the course prerequisites in the program were overly conservative, we took steps to remedy the situation. Now a students have a shorter time to graduation and (we expect) they will be able to graduate faster.

Curriculum: This past year, the most major change was the recognition that CMPE 321 and CMPE 322 were a lecture/lab class pair that complimented each other. In order to reduce the probability that students would be held back an extra year due to prerequisites not being allowed, the two classes have been merged into a single class: CMPE 323. Additionally, prerequisites for classes were reviewed to reduce year-over-year dependencies between classes. The following prerequisite changes were implemented: CMPE 492 now requires CMPE 330; CMPE 344 now requires only CS 201.

Students: As indicated in the previous section, the student enrollment fell due to the COVID19 pandemic. However, this is not unique to the program. We fully expect enrollment to continue growing as things return to a new normal.

Faculty: No significant changes in faculty for the program since the previous 5-year assessment.

Staff: Our department administrator is now shared with Computer Science as well as other programs in the school of Engineering (undergraduate and graduate programs in Industrial Engineering and Construction Management and Civil Engineering). Also, we have an engineering technician who is responsible for managing lab hardware, and purchases, and information technology. The department administrator has changed once, and the

Resources: *(facilities, space, equipment, etc.)* We have brought up the new quadcopter/drone lab which has a working quadcopter drone cage. The College of Science Dean decided to close the quadcopter drone cage and is moving us to a smaller space in the Applied Sciences building. Individual faculty will have a smaller number of work benches to work on in the shared space.

Assessment: We have submitted our ABET self-study report to the accreditation commission and the program has been reviewed by the representatives. We received ABET accreditation for another 5 years.

Other: *(e.g., major program modifications)* none.

II. SUMMARY OF ASSESSMENT *(suggested length of 1-2 pages)*

A. Program Learning Outcomes (PLO)

List all your PLO in this box. Indicate for each PLO its alignment with one or more institutional learning outcomes (ILO). For example: "PLO 1. Apply advanced computer science theory to computation problems (ILO 2 & 6)." Program Learning Outcome(S)

Assessed. *List the PLO(s) assessed. Provide a brief background on your program's history of assessing the PLO(s) (e.g., annually, first time, part of other assessments, etc.)*

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. (ILO 1)
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. (ILO 1 & 5)
3. An ability to communicate effectively with a range of audiences. (ILO 2)
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts. (ILO 3, 4 & 5)
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives. (ILO 3 & 4)
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. (ILO 1 & 2)
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies. (ILO 1, 2, & 4)

B. Summary of Assessment Process

Summarize your assessment process briefly using the following sub-headings.

Instrument(s): *(include if new or old instrument, how developed, description of content)*
The instrument used to access PLO 4 was a paper on the role of artificial intelligence and automation to address ethical and professional responsibilities in engineering situations. Grading is normalized on a scale of 1-4, with 1 being the lowest score and 4 being the highest score.

Sampling Procedure:
All students in CMPE 493 were assessed.

Sample Characteristics:
The course used for assessment is a required course in the computer engineering discipline. Correct completion of the task requires essential knowledge for completion of the degree program.

Data Collection: *(include when, who, and how collected)*
Data were collected by the professor. Raw data scores were normalized to the 1-4 scale at the Mastery level

Data Analysis:
Performance Indicator 5: Write a comprehensive and in-depth analysis paper on ethical and professional responsibilities in engineering situations.

Performance level: Mastery

Rubric:
(1) Paper exhibits a general lack of quality, such as an off-topic content or incomplete submissions.
(2) Paper discusses the subject but does not have sufficient depth.
(3) Paper discusses the subject with reasonable depth.
(4) Paper discusses the subject with in-depth analysis and elaboration.

Course: CMPE 493
Semester: Spring, 2023
Item: Ethics paper

Score	# of Students
1	0
2	4
3	0
4	13
Total Students	*17*
Average Score	*3.65*
Score of 3 or Higher	*76%*

C. Summary of Assessment Results
Summarize your assessment results briefly using the following sub-headings.

Main Findings:
Most students in this class demonstrated an ability to meet the objective of the assignment. They offered analysis and conclusions showing their adequate understanding on the subject although there is room for improvement in the depth and coherency of their thinking.

Next Step(s) for Closing the Loop: *(recommendations to address findings, how & when)*
Offer published articles on this subject for students to read as a framework for their thinking. The can then integrate these articles with their own ideas and analysis to formulate the discussion in their papers.

D. Assessment Plans for Next Year
Summarize your assessment plans for the next year, including the PLO(s) you plan to assess, any revisions to the program assessment plan presented in your last five-year plan self-study, and any other relevant information.

We plan to continue assessment with midterm exam questions and final exam questions where feasible for individual work for PLO 4. This PLO is defined as an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives. (ILO 3 & 4). It will be assessed by a peer review assignment provided in CMPE 492: Senior Design I.

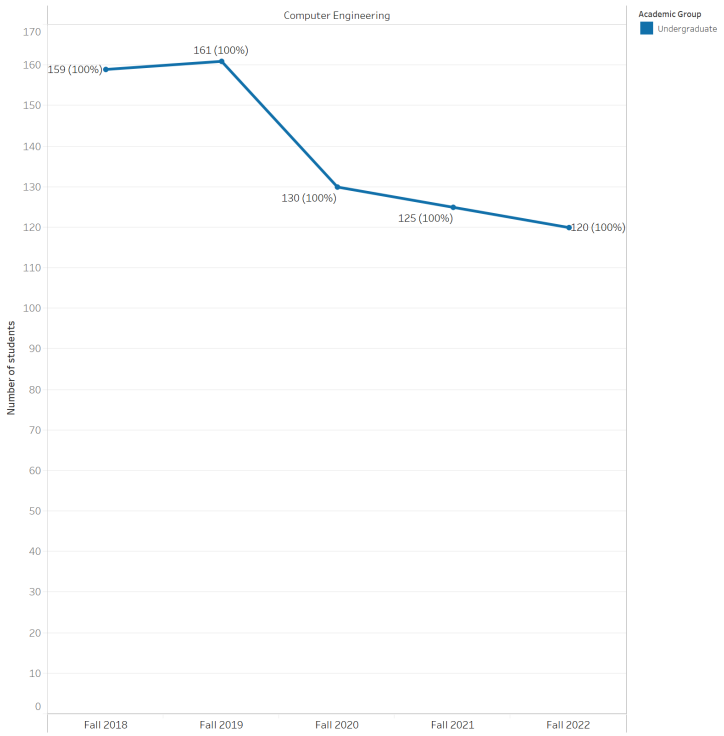
III. DISCUSSION OF PROGRAM DATA & RESOURCE REQUESTS *(suggested length of 2 pages)*

Each program should provide a one-page discussion of the program data available through University Dashboard. This discussion should include an analysis of trends and areas of concern. Programs should also include in this discussion requests for additional resources including space and tenure-track hires. Resource requests must be supported by reference to University Dashboard data.

Requests for tenure-track hires should indicate the area and rank that the program is requesting to hire. If a program is not requesting resources in that year, indicate that no resources are requested.

A. Discussion of Trends & Reflections Notable Trends;
Summarize and discuss any notable trends occurring in your program over the past 3-5 years based on program statistics (1-2 paragraphs). You may include 1-2 pages of supplemental information as appendices to this report (e.g., graphs and tables).

Major: Computer Engineering



Computer Engineering: Race/Etnicity

		Fall 2018		Fall 2019		Fall 2020		Fall 2021		Fall 2022	
		n	%	n	%	n	%	n	%	n	%
Undergraduate	Asian	62	39%	66	41%	54	42%	54	43%	45	38%
	Black	12	8%	11	7%	10	8%	9	7%	10	8%
	International	14	9%	9	6%	7	5%	5	4%	4	3%
	Latinx	48	30%	55	34%	43	33%	39	31%	47	39%
	Multirace	5	3%	3	2%	3	2%	4	3%	3	3%
	Native American							1	1%	1	1%
	NHPI	2	1%	2	1%	1	1%	3	2%	3	3%
	Unknown	2	1%	1	1%	4	3%	2	2%	1	1%
	White	14	9%	14	9%	8	6%	8	6%	6	5%
	Total	**159**	**100%**	**161**	**100%**	**130**	**100%**	**125**	**100%**	**120**	**100%**
Postbaccalaureate	International									1	50%
	Latinx									1	50%
	Total									**2**	**100%**
Grand Total		**159**	**100%**	**161**	**100%**	**130**	**100%**	**125**	**100%**	**122**	**100%**

Computer Engineering: Sex

		Fall 2018		Fall 2019		Fall 2020		Fall 2021		Fall 2022	
		n	%	n	%	n	%	n	%	n	%
Undergraduate	Female	13	8%	13	8%	8	6%	11	9%	13	11%
	Male	146	92%	148	92%	122	94%	114	91%	107	89%
	Total	**159**	**100%**	**161**	**100%**	**130**	**100%**	**125**	**100%**	**120**	**100%**
Postbaccalaureate	Male									2	100%
	Total									**2**	**100%**
Grand Total		**159**	**100%**	**161**	**100%**	**130**	**100%**	**125**	**100%**	**122**	**100%**

Computer Engineering: First Generation

		Fall 2018		Fall 2019		Fall 2020		Fall 2021		Fall 2022	
		n	%	n	%	n	%	n	%	n	%
Undergraduate	FG	86	54%	96	60%	81	62%	66	53%	67	56%
	Non-FG	73	46%	65	40%	49	38%	59	47%	53	44%
	Total	**159**	**100%**	**161**	**100%**	**130**	**100%**	**125**	**100%**	**120**	**100%**
Postbaccalaureate	FG									1	50%
	Non-FG									1	50%
	Total									**2**	**100%**
Grand Total		**159**	**100%**	**161**	**100%**	**130**	**100%**	**125**	**100%**	**122**	**100%**

Computer Engineering: Admit Type

		Fall 2018		Fall 2019		Fall 2020		Fall 2021		Fall 2022	
		n	%	n	%	n	%	n	%	n	%
Undergraduate	First-time Fr..	126	79%	123	76%	98	75%	93	74%	88	73%
	Transfer	33	21%	38	24%	32	25%	32	26%	32	27%
	Total	159	100%	161	100%	130	100%	125	100%	120	100%
Grand Total		159	100%	161	100%	130	100%	125	100%	120	100%

Computer Engineering: Class Level

		Fall 2018		Fall 2019		Fall 2020		Fall 2021		Fall 2022	
		n	%	n	%	n	%	n	%	n	%
Undergraduate	Frosh	74	47%	56	35%	40	31%	36	29%	36	30%
	Sophomore	23	14%	35	22%	22	17%	24	19%	27	23%
	Junior	25	16%	29	18%	23	18%	20	16%	18	15%
	Senior	37	23%	41	25%	45	35%	45	36%	39	33%
	Total	159	100%	161	100%	130	100%	125	100%	120	100%
Postbaccalaureate	Postbacc									2	100%
	Total									2	100%
Grand Total		159	100%	161	100%	130	100%	125	100%	122	100%

Graduation/Degree Data

Time to Degree Years (and Headcount)

		Transfer	First-time Freshmen
Overall		3.0 (6)	4.8 (10)
CSCI	Computer Engineering	3.0 (6)	4.8 (10)

APR Coursework Data: Summary: Fall Term as of Census

FTES, FTEF (instruction), and SFR of all state-side coursework

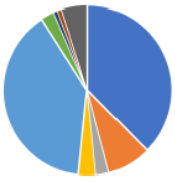
		Term & Year														
		Fall 2018			Fall 2019			Fall 2020			Fall 2021			Fall 2022		
College	Department	FTES	FTEF	SFR	FTES	FTEF	SFR	FTES	FTEF	SFR	FTES	FTEF	SFR	FTES	FTEF	SFR
CSCI	CS	361.5	13.6	26.6	426.9	14.5	29.4	502.0	17.2	29.2	506.6	17.9	28.4	536.3	18.1	29.6
	ENGR	163.1	7.3	22.2	184.3	8.6	21.3	191.7	8.0	24.0	172.1	8.3	20.6	238.7	8.3	28.7
	Total	524.6	20.9	25.1	611.2	23.2	26.4	693.6	25.2	27.6	678.7	26.2	25.9	775.0	26.4	29.3
Grand Total		524.6	20.9	25.1	611.2	23.2	26.4	693.6	25.2	27.6	678.7	26.2	25.9	775.0	26.4	29.3

Reflections on Trends and Program Statistics:

Provide your reflections on the trends discussed above and statistics and supplemental information presented in this report.

During the COVID19 pandemic we realized a loss of students due to a number factors beyond our control which impacted enrollment. This trend was common across all the university enrollment. It should be noted that we see an upward trend from F2021 to F2023 by 2%. We forecast that there will be another 2% or more increase in enrollment.

From the census collected in CMPE classes for Fall 2023 indicate that we have a large number of underrepresented minorities in the major which comports with the greater population of CSU East Bay:



DIVERSITY

Almost half (47.5%) are URM
(39.2% Latinx, 8.3% Black)

B. Request for Resources *(suggested length of 1 page)*

1. Request for Tenure-Track Hires: provide evidence from trends provided
   Due to an enrollment drop that can be attributed to COVID19, no requests for tenure-track hires at this time. We expect student enrollment to start increasing again based on pre-pandemic trends.

2. Request for Other Resources
   We request $50 per student in the program ($6500) per year in order to purchase consumable lab supplies. We also request an extra $50 per student ($6500) per year in order to purchase repair/replace lab test equipment that has been damaged by students during the learning process. As our students are learning how to use hardware safely and effectively, we make an extra effort to teach them about the dangers of using lab equipment improperly. We instruct them step-by-step in lab hardware usage. Unfortunately, with first time users, the probability of misusing hardware is relatively high. Therefore lab equipment repair/replacement is a recurring cost.Total monies requested is $13,000 per year.