

2017 - 2018 Annual Program Assessment Report

The Office of Academic Program Assessment
California State University, Sacramento

For more information visit our [website](#)
or [contact us](#) for more help.

Please begin by selecting your program name in the drop down.

If the program name is not listed, please enter it below:

MS Computer Engineering

OR enter program name:

Section 1: Report All of the Program Learning Outcomes Assessed

Question 1: Program Learning Outcomes

Q1.1.

Which of the following Program Learning Outcomes (PLOs), Sac State Baccalaureate Learning Goals (BLGs), and emboldened Graduate Learning Goals (GLGs) **did you assess?** [**Check all that apply**]

- 1. **Critical Thinking**
- 2. **Information Literacy**
- 3. **Written Communication**
- 4. **Oral Communication**
- 5. Quantitative Literacy
- 6. **Inquiry and Analysis**
- 7. Creative Thinking
- 8. Reading
- 9. Team Work
- 10. Problem Solving
- 11. Civic Knowledge and Engagement
- 12. **Intercultural Knowledge, Competency, and Perspectives**
- 13. Ethical Reasoning
- 14. Foundations and Skills for Lifelong Learning
- 15. **Global Learning and Perspectives**
- 16. Integrative and Applied Learning
- 17. Overall Competencies for GE Knowledge
- 18. **Overall Disciplinary Knowledge**
- 19. **Professionalism**
- 20A. Other, specify any assessed PLOs not included above:

a.

b.

c.

20B. **Check here if your program has not collected any data for any PLOs.** Please go directly to Q6 (skip Q1.2 to Q5.3.1.)

Q1.2.

Please provide more detailed background information about **EACH PLO** you checked above and other information including how your specific PLOs are **explicitly** linked to the Sac State **BLGs/GLGs**:

Please refer to the attached document about the list of program PLOs and their map to the BLGs (Tables 1 and 2). Also, note that Table 2, the mapping of the PLOs to the GLGs was updated since the last assessment report. We noticed that our previous mapping did not distinguish among three GLGs, disciplinary knowledge, critical thinking/analysis, and information literacy.

Q1.2.1.

Do you have rubrics for your PLOs?

- 1. Yes, for all PLOs
- 2. Yes, but for some PLOs
- 3. No rubrics for PLOs
- 4. N/A
- 5. Other, specify:

The criteria for below, met, and exceed
Expectations are determined by instructor

Q1.3.

Are your PLOs closely aligned with the mission of the university?

- 1. Yes
- 2. No
- 3. Don't know

Q1.4.

Is your program externally accredited (other than through WASC Senior College and University Commission (WSCUC))?

- 1. Yes
- 2. No (skip to **Q1.5**)
- 3. Don't know (skip to **Q1.5**)

Q1.4.1.

If the answer to Q1.4 is **yes**, are your PLOs closely aligned with the mission/goals/outcomes of the accreditation agency?

- 1. Yes
- 2. No
- 3. Don't know

Q1.5.

Did your program use the **Degree Qualification Profile** ("DQP", see <http://degreeprofile.org>) to develop your PLO(s)?

- 1. Yes
- 2. No, but I know what the DQP is
- 3. No, I don't know what the DQP is
- 4. Don't know

Q1.6.

Did you use action verbs to make each PLO measurable?

- 1. Yes
- 2. No
- 3. Don't know

(Remember: Save your progress)**Section 2: Report One Learning Outcome in Detail****Question 2: Standard of Performance for the Selected PLO****Q2.1.**

Select **OR** type in **ONE(1)** PLO here as an example to illustrate how you conducted assessment (be sure you checked the **correct box** for this PLO in Q1.1):

Creative Thinking

If your PLO is **not listed**, please enter it here:

Q2.1.1.

Please provide more background information about the **specific PLO** you've chosen in Q2.1.

PLO 3 is creative thinking and it was assessed in two courses CSc/EEE 273, which is a cross listed course with CSc and EEE departments and the course is taken by CSc, EEE and as well as the CpE students. The PLO was also assessed in CpE 201. Please refer to the attached document for assessment details. Specifically refer to Tables 7 and 8.

Q2.2.

Has the program developed or adopted **explicit program standards of performance/expectations** for this PLO? (e.g. "We expect 70% of our students to achieve at least a score of 3 or higher in all dimensions of the Written Communication VALUE rubric.")

- 1. Yes
- 2. No
- 3. Don't know
- 4. N/A

Q2.3.

Please **1) provide and/or attach the rubric(s) AND 2) the standards of performance/expectations** that you have developed for *the selected PLO* here:

Please refer to the attached supporting Section IV: Assessment Results.

 No file attached

 No file attached

Q2.4. PLO	Q2.5. Stdrd	Q2.6. Rubric	Please indicate where you have published the PLO , the standard (stdrd) of performance, and the rubric that was used to measure the PLO:
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. In SOME course syllabi/assignments in the program that address the PLO

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. In ALL course syllabi/assignments in the program that address the PLO
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. In the student handbook/advising handbook
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. In the university catalogue
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. On the academic unit website or in newsletters
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. In the assessment or program review reports, plans, resources, or activities
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. In new course proposal forms in the department/college/university
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. In the department/college/university's strategic plans and other planning documents
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. In the department/college/university's budget plans and other resource allocation documents
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Other, specify: <input type="text"/>

Question 3: Data Collection Methods and Evaluation of Data Quality for the Selected PLO

Q3.1.

Was assessment data/evidence **collected** for the selected PLO?

- 1. Yes
- 2. No (skip to **Q6**)
- 3. Don't know (skip to **Q6**)
- 4. N/A (skip to **Q6**)

Q3.1.1.

How many assessment tools/methods/measures **in total** did you use to assess this PLO?

Q3.2.

Was the data **scored/evaluated** for this PLO?

- 1. Yes
- 2. No (skip to **Q6**)
- 3. Don't know (skip to **Q6**)
- 4. N/A (skip to **Q6**)

Q3.2.1.

Please describe how you collected the assessment data for the selected PLO. For example, in what course(s) or by what means were data collected:

In CSc/EEE, the CpE students were assessed on certain Final Exam problems as well as the term project. In CpE 201, all the students were assessed using their assignment to complete a topic form for a project in another graduate class. In the topic form students were required to organize a background and goals for the project.

(Remember: Save your progress)

Question 3A: Direct Measures (key assignments, projects, portfolios, etc.)

Q3.3.

Were direct measures (key assignments, projects, portfolios, course work, student tests, etc.) used to assess this PLO?

- 1. Yes
- 2. No (skip to **Q3.7**)
- 3. Don't know (skip to **Q3.7**)

Q3.3.1.

Which of the following direct measures (key assignments, projects, portfolios, course work, student tests, etc.) were used? [**Check all that apply**]

- 1. Capstone project (e.g. theses, senior theses), courses, or experiences
- 2. Key assignments from required classes in the program
- 3. Key assignments from elective classes
- 4. Classroom based performance assessment such as simulations, comprehensive exams, or critiques
- 5. External performance assessments such as internships or other community-based projects
- 6. E-Portfolios
- 7. Other Portfolios
- 8. Other, specify:

Q3.3.2.

Please **1) provide and/or attach the direct measure** (key assignments, projects, portfolios, course work, student tests, etc.) you used to collect data, **THEN 2) explain here** how it assesses the PLO:

Specific Final Exam questions and term project in CSc/EEE 273 to assess students' problem solving and creative thinking skills, and research topic assignment in CpE 201 that included an introduction that was tested by Turnitin percentage match to assess the students understanding of ethical standards as part of professionalism.

 **No file attached**  **No file attached**

Q3.4.

What tool was used to evaluate the data?

- 1. **No** rubric is used to interpret the evidence (skip to **Q3.4.4.**)
- 2. Used rubric developed/modified by the faculty who teaches the class (skip to **Q3.4.2.**)
- 3. Used rubric developed/modified by a group of faculty (skip to **Q3.4.2.**)
- 4. Used rubric pilot-tested and refined by a group of faculty (skip to **Q3.4.2.**)
- 5. The VALUE rubric(s) (skip to **Q3.4.2.**)
- 6. Modified VALUE rubric(s) (skip to **Q3.4.2.**)
- 7. Used other means (Answer **Q3.4.1.**)

Q3.4.1.

If you used other means, which of the following measures was used? [**Check all that apply**]

- 1. National disciplinary exams or state/professional licensure exams (skip to **Q3.4.4.**)
- 2. General knowledge and skills measures (e.g. CLA, ETS PP, etc.) (skip to **Q3.4.4.**)
- 3. Other standardized knowledge and skill exams (e.g. ETC, GRE, etc.) (skip to **Q3.4.4.**)
- 4. Other, specify:

class performance at a specific level determined by instructors.

(skip to **Q3.4.4.**)

Q3.4.2.

Was the **rubric** aligned directly and explicitly **with the PLO**?

- 1. Yes
- 2. No
- 3. Don't know
- 4. N/A

Q3.4.3.

Was the **direct measure** (e.g. assignment, thesis, etc.) aligned directly and explicitly **with the rubric**?

- 1. Yes
- 2. No
- 3. Don't know
- 4. N/A

Q3.4.4.

Was the **direct measure** (e.g. assignment, thesis, etc.) aligned directly and explicitly **with the PLO**?

- 1. Yes
- 2. No
- 3. Don't know
- 4. N/A

Q3.5.

Please enter the number (#) of faculty members who participated in planning the assessment data **collection** of the selected PLO?

Q3.5.1.

Please enter the number (#) of faculty members who participated in the **evaluation** of the assessment data for the selected PLO?

Q3.5.2.

If the data was evaluated by multiple scorers, was there a norming process (a procedure to make sure everyone was scoring similarly)?

- 1. Yes
- 2. No
- 3. Don't know
- 4. N/A

Q3.6.

How did you **select** the sample of student work (papers, projects, portfolios, etc.)?

All the CpE students in the courses were assessed.

Q3.6.1.

How did you **decide** how many samples of student work to review?

N/A

Q3.6.2.

Please enter the number (#) of students that were in the class or program?

17 in CSc/EEE 273, and
12 in CpE 201

Q3.6.3.

Please enter the number (#) of samples of student work that you evaluated?

17 in CSc/EEE 273, and
12 in CpE 201

Q3.6.4.

Was the sample size of student work for the direct measure adequate?

- 1. Yes
- 2. No
- 3. Don't know

(Remember: Save your progress)

Question 3B: Indirect Measures (surveys, focus groups, interviews, etc.)

Q3.7.

Were indirect measures used to assess the PLO?

- 1. Yes
- 2. No (skip to **Q3.8**)
- 3. Don't Know (skip to **Q3.8**)

Q3.7.1.

Which of the following indirect measures were used? [**Check all that apply**]

- 1. National student surveys (e.g. NSSE)
- 2. University conducted student surveys (e.g. OIR)
- 3. College/department/program student surveys or focus groups
- 4. Alumni surveys, focus groups, or interviews
- 5. Employer surveys, focus groups, or interviews
- 6. Advisory board surveys, focus groups, or interviews
- 7. Other, specify:

Q3.7.1.1.

Please explain and attach the indirect measure you used to collect data:

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 No file attached
Q3.7.2.

If surveys were used, how was the sample size **decided**?

Q3.7.3.

If surveys were used, how did you **select** your sample:

Q3.7.4.

If surveys were used, please enter the response rate:

Question 3C: Other Measures
(external benchmarking, licensing exams, standardized tests, etc.)

Q3.8.

Were external benchmarking data, such as licensing exams or standardized tests, used to assess the PLO?

1. Yes
 2. No (skip to **Q3.8.2**)
 3. Don't Know (skip to **Q3.8.2**)

Q3.8.1.

Which of the following measures was used? [**Check all that apply**]

1. National disciplinary exams or state/professional licensure exams
 2. General knowledge and skills measures (e.g. CLA, ETS PP, etc.)
 3. Other standardized knowledge and skill exams (e.g. ETC, GRE, etc.)
 4. Other, specify:

Q3.8.2.


Were other measures used to assess the PLO?


1. Yes

- 2. No (skip to **Q4.1**)
- 3. Don't know (skip to **Q4.1**)

Q3.8.3.

If other measures were used, please specify:

 No file attached

 No file attached


(Remember: Save your progress)


Question 4: Data, Findings, and Conclusions

Q4.1.

Please provide tables and/or graphs to summarize the assessment data, findings, and conclusions for the selected PLO in **Q2.1** (see Appendix 12 in our [Feedback Packet Example](#)):

Please refer to the attached assessment summary document.

 MS program CpE related document - 2017-2018 - University Assessment Office.pdf
934.29 KB

 No file attached

Q4.2.

Are students doing well and meeting the program standard? **If not**, how will the program work to improve student performance of the selected PLO?

Based on the overall assessment results, 85.07% of the students met or exceeded the expectations for creative thinking. However, the average scored was skewed by the assessment data obtained in CSc/EEE 273. The assessment data in CSc/EEE 273 indicate that when it comes for students to be creative in terms of producing their own solutions, students' performances are extremely good; 100% of the students met or exceeded expectations in providing design solutions for their term project and solving the PLO-specific exam questions. However, when students are required to critically think and analyze other solutions, several lack the skills to summarize a research article. They tend to copy. The assessment data obtained in CpE 201 only indicate that 62.67%, the average of 67.00 and 58.33 (see Table 6), met or exceeded the expectations. The instructor for the course has stated that he will place more emphasis to such topics in the next academic year.

 No file attached

 No file attached

Q4.3.

For the selected PLO, the student performance:

- 1. **Exceeded** expectation/standard
- 2. **Met** expectation/standard
- 3. **Partially** met expectation/standard
- 4. Did not meet expectation/standard
- 5. No expectation/standard has been specified
- 6. Don't know

Question 4A: Alignment and Quality

Q4.4.

Did the data, including the direct measures, from all the different assessment tools/measures/methods directly align with the PLO?

- 1. Yes
- 2. No
- 3. Don't know

Q4.5.

Were **all** the assessment tools/measures/methods that were used good measures of the PLO?

- 1. Yes
- 2. No
- 3. Don't know

Question 5: Use of Assessment Data (Closing the Loop)

Q5.1.

As a result of the assessment effort and based on prior feedback from OAPA, do you anticipate **making any changes** for your program (e.g. course structure, course content, or modification of PLOs)?

- 1. Yes
- 2. No (skip to **Q5.2**)
- 3. Don't know (skip to **Q5.2**)

Q5.1.1.

Please describe **what changes** you plan to make in your program as a result of your assessment of this PLO.

Please refer to Q4.2. The instructor for the course has stated that he will place more emphasis to such topics in the next academic year.

Q5.1.2.

Do you have a plan to assess the **impact of the changes** that you anticipate making?

- 1. Yes, describe your plan:

Such assignment is given every semester in CpE 201. More discussions on the requirements for how to write a summer and the reasons for it will be included in the course in fall 2018 and spring 2019.

2. No
 3. Don't know

Q5.2.

To what extent did you apply **previous assessment results** collected through your program in the following areas?

	1. Very Much	2. Quite a Bit	3. Some	4. Not at All	5. N/A
1. Improving specific courses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Modifying curriculum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Improving advising and mentoring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Revising learning outcomes/goals	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Revising rubrics and/or expectations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Developing/updating assessment plan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Annual assessment reports	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Program review	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Prospective student and family information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Alumni communication	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. WSCUC accreditation (regional accreditation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Program accreditation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. External accountability reporting requirement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Trustee/Governing Board deliberations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Strategic planning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Institutional benchmarking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Academic policy development or modifications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Institutional improvement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Resource allocation and budgeting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. New faculty hiring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. Professional development for faculty and staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. Recruitment of new students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. Other, specify: <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q5.2.1.

Please provide a detailed example of how you used the assessment data above:

The mapping between the PLOs and the GLGs were incorrect since the assessment results obtained last year did not produce distinguishable results for three of the GLGs, namely disciplinary knowledge, critical thinking/analysis, and information literacy . Therefore, after careful evaluation of the PLOs and GLGs, we believe that the new mapping makes more sense. Please refer to the new PLO to GLGs mapping (Table 2) in the attached document.

Q5.3.

To what extent did you apply **previous assessment feedback** from the Office of Academic Program Assessment in the following areas?

	1.	2.	3.	4.	5.
	Very Much	Quite a bit	Some	Not at All	N/A
1. Program Learning Outcomes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Standards of Performance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Measures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Rubrics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Alignment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Data Collection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Data Analysis and Presentation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Use of Assessment Data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Other, please specify:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The previous feedback helped us to improve the reporting of our as:	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q5.3.1.

Please share with us an example of how you applied **previous feedback** from the Office of Academic Program Assessment in any of the areas above:

It appeared that in the past we may not have reported or completed this form completely/correctly. For example, we may have missed to report what instruments were used to assess the students and not clearly identify the areas that students' performance can be improved.

(Remember: Save your progress)

Section 3: Report Other Assessment Activities

Other Assessment Activities

Q6.

If your program/academic unit conducted assessment activities that are **not directly related to the PLOs** for this year (i.e. impacts of an advising center, etc.), please provide those activities and results here:

During 2017-2018 academic year, we were able to overhaul the MS curriculum. The process involved reviewing other graduate programs in computer engineering in order to create a new curriculum. The new curriculum better balances the units between the CSc and EEE subject areas, but also provides the students: 1) more freedom on elective courses, and 2) better balances the units divided between the core required courses and the breadth required subject areas. According to the new ACM/IEEE proposed new CpE curriculum additional subjects areas are recommended for CpE degree programs. By providing the students' the option to choose from a wide range of elective courses -- that seems to be the trend in other institutions -- we are able to provide our students a more robust curriculum that while it provides a solid background in the traditional CpE subjects, it also allows the students to excel their education in other interdisciplinary subject areas. Case in point, several students have already expressed an interest in also studying AI (artificial intelligence) and deep learning, a new trend to better analyze big data sets, so they can implement such techniques in hardware to speed up processing.

Q6.1.

Please explain how the assessment activities reported in **Q6** will be linked to any of your PLOs and/or PLO assessment in the future and to the mission, vision, and the strategic planning for the program and the university:

The updated new curriculum still supports the existing program PLOs and the GLGs.

Q7.

What PLO(s) do you plan to assess next year? [**Check all that apply**]

- 1. **Critical Thinking**
- 2. **Information Literacy**
- 3. **Written Communication**
- 4. **Oral Communication**
- 5. Quantitative Literacy
- 6. **Inquiry and Analysis**
- 7. Creative Thinking
- 8. Reading
- 9. Team Work
- 10. Problem Solving
- 11. Civic Knowledge and Engagement
- 12. **Intercultural Knowledge, Competency, and Perspectives**
- 13. Ethical Reasoning
- 14. Foundations and Skills for Lifelong Learning
- 15. **Global Learning and Perspectives**
- 16. Integrative and Applied Learning
- 17. Overall Competencies for GE Knowledge
- 18. **Overall Disciplinary Knowledge**
- 19. **Professionalism**
- 20. Other, specify any PLOs not included above:

a.

b.

c.

Q8.

Please explain how this year's assessment activities help you address recommendations from your department's last program review?

N/A

Q9. Please attach any additional files here:



MS program CpE related document - 2017-2018 - Univerysity Assessment Office.pdf
934.29 KB

No file attached

No file attached

No file attached

Q9.1.

If you have attached **any** files to this form, please list **every** attached file here:

"MS program CpE related document - 2017-2018 - University Assessment Office"

"MS curriculm map"

"CpE Assessment Plans Spring 2015 Final"

Section 4: Background Information about the Program

Program Information (**Required**)

Program:

(If you typed in your program name at the beginning, please skip to **Q11**)

Q10.

Program/Concentration Name: [skip if program name is already selected or appears above]

MS Computer Engineering

Q11.

Report Author(s):

Nikrouz Faroughi

Q11.1.

Department Chair/Program Director:

Nikrouz Faroughi

Q11.2.

Assessment Coordinator:

Nikrouz Faroughi

Q12.

Department/Division/Program of Academic Unit (select):

Computer Engineering

Q13.

College:

College of Engineering and Computer Science

Q14.

What is the total enrollment (#) for Academic Unit during assessment (see Departmental Fact Book):

19 as of fall 2016. 2017 data not available

Q15.

Program Type:

1. Undergraduate baccalaureate major
 2. Credential

- 3. Master's Degree
- 4. Doctorate (Ph.D./Ed.D./Ed.S./D.P.T./etc.)
- 5. Other, specify:

Q16. Number of **undergraduate degree programs** the academic unit has?

Q16.1. List all the names:

BS in computer engineering

Q16.2. How many concentrations appear on the diploma for this undergraduate program?

Q17. Number of **master's degree programs** the academic unit has?

Q17.1. List all the names:

MS in computer engineering

Q17.2. How many concentrations appear on the diploma for this master's program?

Q18. Number of **credential programs** the academic unit has?

Q18.1. List all the names:

Q19. Number of **doctorate degree programs** the academic unit has?

Q19.1. List all the names:

When was your Assessment Plan...	1.	2.	3.	4.	5.	6.	7.	8.
	Before 2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	No Plan	Don't know

Q20. Developed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q20.1. Last updated?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q20.2. (Required)

Please **obtain** and **attach** your latest **assessment plan**:



CpE Assessment Plans Spring 2015 Final.pdf
314.59 KB

Q21.

Has your program developed a **curriculum map**?

- 1. Yes
- 2. No
- 3. Don't know

Q21.1.

Please **obtain** and **attach** your latest **curriculum map**:



MS curriculum map.pdf
68.67 KB

Q22.

Has your program indicated explicitly in the curriculum map where assessment **of student learning** occurs?

- 1. Yes
- 2. No
- 3. Don't know

Q23.

Does your program have a capstone class?

- 1. Yes, specify:

- 2. No
- 3. Don't know

Q23.1.

Does your program have a capstone project(s)?

- 1. Yes
- 2. No
- 3. Don't know

(Remember: Save your progress)
Save When Completed!

ver. 10.31.17

Computer Engineering Assessment Related Document 2017-2018

Section I: Program Learning Outcomes (PLOs)

Table 1. Graduate Learning Goals/Objectives and Program Learning Outcomes

Computer Engineering	
Graduate Learning Objectives	Program Learning Outcomes
Graduates will be capable of integrating undergraduate fundamentals and advanced knowledge to solve complex Computer Engineering related problems	1. Problem Solving: Graduates apply knowledge from their undergraduate and graduate computer engineering studies and related disciplines to solve complex computer engineering problems that require advanced knowledge within the field.
Graduates will be prepared for professional advancement in computer engineering. They will have the ability to pursue continuous learning and identify, understand, and apply new knowledge within the field.	2. Critical thinking: Graduates understand and integrate new knowledge within the field.
Graduates will have the ability to undertake a research and development project and to document the work in clear and effective manner, appropriate to the standards in the field.	3. Creative thinking: Graduates can plan and conduct projects on advanced topics within the field.
Graduates will have the ethics and the communication skills to be an effective team member.	4. Written communication: Graduates can report on advanced topics within the field.
	5. Integrative and applied learning: Graduates can work as a team in a diverse changing world.
	6. Civic knowledge and engagement: Graduates recognize the ethical standards, and possess skills for effective communication.

Institutional Graduate Learning Goals for *Masters* Programs

1. **Disciplinary knowledge:** Master, integrate, and apply disciplinary knowledge and skills to current, practical, and important contexts and situations.
2. **Communication:** Communicate key knowledge with clarity and purpose both within the discipline and in broader contexts.
3. **Critical thinking/analysis:** Demonstrate the ability to be creative, analytical, and critical thinkers.
4. **Information literacy:** Demonstrate the ability to obtain, assess, and analyze information from a myriad of sources.
5. **Professionalism:** Demonstrate an understanding of professional integrity.
6. **Intercultural/Global Perspectives:** Demonstrate relevant knowledge and application of intercultural and/or global perspectives.

Table 2 shows the updated mapping between the graduate level PLOs and the university graduate learning goals (GLGs). The mapping was updated after the assessment report last year when we noticed that our previous mapping did not distinguish among three GLGs, disciplinary knowledge, critical thinking/analysis, and information literacy.

Table 2. Mapping of CpE Program Learning Outcomes to Institutional Graduate Learning Goals (GLGs) for Masters Programs (updated 8-24-2017)

Program Learning Outcomes	Institutional Graduate Learning Goals for Masters Programs					
	1. Disciplinary knowledge	2. Communication	3. Critical thinking/analysis	4. Information literacy	5. Professionalism	6. Intercultural/Global Perspectives
1. Problem Solving	X					
2. Critical thinking			X	X		
3. Creative thinking			X			
4. Written communication		X				
5. Integrative and applied learning				X		X
6. Civic knowledge and engagement		X			X	X

Table 3. Curriculum Map: Courses, PLOs, and Assessment instruments

Course Work	PLO 1: Problem Solving (e.g., exam, homework)	PLO 2: Critical Thinking (e.g., exam, research paper, project)	PLO 3: Creative Thinking (e.g., project)	PLO 4: Written communication (e.g., research paper, project)	PLO 5: Integrative and applied learning (e.g., teamwork, etc.)	PLO 6: Civic knowledge and engagement (e.g., ethical standards, communication, etc.)
Core:						
CpE 201		X		X		X
CSc 205	X		X			
CSc/EEE 273	X		X			
EEE 270	X		X	X		
Breath:						
CSc 151	X	X	X			
CSc 159	X	X			X	
CSc 206						
CSc 239	X		X			
CSc 242	X		X			
CSc 250	X		X			
CSc 253	X		X			
CSc 254	X		X			
CSc 255	X	X		X		
CSc/EEE 280	X	X		X		
EEE 221	X		X	X	X	
EEE 225	X		X	X	X	
EEE 230	X		X			
EEE 231	X		X			
EEE 232	X		X			
EEE 234	X		X			
EEE 235			X			
EEE 236	X					
EEE 238	X					
EEE 239	X					
EEE 244	X		X	X	X	
EEE 246	X		X	X	X	

EEE 272	X	X				
EEE 274	X		X			
EEE 285	X	X				
EEE 286	X	X				

Section II. Assessment Plan

Table 4. Assessment Plan

Lines of Evidence for Assessing Graduate Program Learning Outcomes						
Date	PLO	Direct Lines of Evidence (Example: Assignments in core courses; early writing assessment)	Indirect Lines of Evidence (Mid-course assessments; Alumni Survey)	Lead/Resources (Example: Faculty Advisors; Course Instructor; Department Chair)	Evaluation Parameters & Timeline: Examples of timeline: Admission (A); Exit (E); On-going (O); Follow up with Alumni (F); Qualification for Culminating Experience (Q)	Evaluation of each PLO based on direct lines of evidence
Data Collection: Once a year per course offered (starting 2015-2016) Assessment: Every 3 years	1: Application of Knowledge	Exam questions		Course Instructor	1 st year vs. 2nd year graduate students (O)	
	2: Critical Thinking			Course Instructor	1 st year vs. 2nd year graduate students (O)	Research Paper (assessing the content)
	3: Creative Thinking			Course Instructor	1 st year vs. 2nd year graduate students (O)	Projects (e.g., assessing the quality of student work in class projects)
	4: Written Communication			Course Instructor	1 st year vs. 2nd year graduate students (O)	Sample topic form, Sample Introduction, References (CpE 201), and research paper.
	5: Integrative and applied learning		Course instructor, Alumni Survey		1 st year vs. 2nd year graduate students (O), F	
Every 3 years	5: Integrative and applied learning		Course instructor, Alumni Survey		1 st year vs. 2nd year graduate students (O), F	
	6: Civic knowledge and engagement		Alumni Survey		F	

Table 5. Assessment Plan Details

PLO	Assessment Data Summary	Evaluation	Actions for Program Improvement and/or Continuation
1: Application of Knowledge	Problem Scores	Evaluation rubric to evaluate students' abilities for applying a range of undergraduate and graduate knowledge from disciplines to solve complex computer engineering problems.	Identify the areas of weakness and make (if necessary) course or curriculum related changes to improve student outcomes.
2: Critical Thinking	Problem scores, research paper	Evaluation rubric to assess the students' abilities to comprehend and integrate new knowledge in solving problems or reporting on scientific publications	Identify the areas of weakness and make (if necessary) course or curriculum related changes to improve student outcomes.
3: Creative Thinking	Project report	Evaluation rubric to assess the students' abilities to plan and conduct projects	Identify the areas of weakness and make (if necessary) course or curriculum related changes to improve student outcomes.
4: Written Communication	Research paper	Written evaluation rubric	Assess students' abilities to plan and conduct projects.
5: Integrative and applied learning	Alumni Survey	Alumni assess their job-related performance especially their teamwork skills	Use survey data to assess graduates' abilities to work effectively in a diverse and changing world.
6: Civic knowledge and engagement	Alumni Survey	Alumni assess their job-related performance especially their professionalism and communication skills	Use survey data to assess graduates' abilities to communicate and function effectively according to the common norms in a professional environment.

Section III. Assessment Data Collection

CpE 201

PLO1: Problem Solving: Graduates apply knowledge from their undergraduate and graduate computer engineering studies and related disciplines to solve complex computer engineering problems that require advanced knowledge within the field.

PLO2: Critical thinking: Graduates understand and integrate new knowledge within the field.

PLO6: Civic knowledge and engagement: Graduates recognize the ethical standards, and possess skills for effective communication.

CSc/EEE 273

PLO1: Problem Solving (Final Exam Problems)

PLO3: Creative Thinking (Term Project)

CSc 255

PLO1: Problem Solving (Exam Problems and 1 Assignment)

PLO3: Creative Thinking (Term Project)

EEE 234

Course outcome (COs): After successfully completing this course, students will be able to:

CO_1 Students will be able to apply basic semiconductor device physics that dictate the operation of CMOS circuits

CO_2 Students will be able to analyze and design CMOS logic gates at the transistor level, including memory

CO_3 Students will be able to make tradeoffs between performance, power, and area for CMOS digital circuits

CO_4 Students will be able to use a professional style physical design tool to layout CMOS logic circuits

CO_5 Students will be able to describe issues and make tradeoffs associated with large “system on a chip” designs

Table 6. Relationship of EEE 234 Course Outcomes to CpE Graduate Level PLOs.

Course Outcomes		MS Program PLOs					
		PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
EEE 270	1.	X					
	2.	X					
	3.			X			
	4.			X			
	5.			X			

EEE 270

PLO1: Problem Solving (Exam Problems)

PLO3: Creative Thinking (Term Project)

PLO4: Written Communication (Term Project)

Section IV. Assessment Results

Table 6 shows the summary of the assessment results, excluding the results for EEE 255, EEE 234, and EEE 270 due to fewer CpE students in these classes. The assessment results indicate that 92.59%, 85.07%, 67%, and 58.50% of students meet or exceeded expectations for PLO 1 (problem solving), PLO 3 (Creative Thinking), PLO 4 (Written Communication), and PLO 6 (Civic Knowledge and Engagement), respectively. CSc uses 70% as the threshold for the number of students meeting the criteria. In EEE, the threshold for the number of students meeting the expectations needs to be normalized to the standard threshold of 70%. Table 7 shows the assessment results mapped to the Institutional Graduate Learning Goal (IGLGs).

Table 7. CpE MS Program Assessment 2017-2018: Individual Course Assessment Summary

Program Learning Outcomes (PLOs)	Courses Taught by CSc				Courses Taught by EEE					Average
	CSc 255-F16 (5)	CSc/EEE 273-S16 (9)	CSc/EEE 273-S17 (3)	CSc/EEE 273-S18 (5)	EEE 234-S16 (6)	CpE 201-F17 (6)	CpE 201-S18 (6)	EEE 270-S16 (2)	EEE 270-S18 (5)	
1. Problem Solving	80.00	77.78	100.00	100.00	62.50			100	60	92.59
2. Critical thinking									60	
3. Creative thinking	100.00	100.00	100.00	100.00	100.00	67.00	58.33	50		85.07
4. Written communication						67.00	67.00	50		67.00
5. Integrative and applied learning										
6. Civic knowledge and engagement						67.00	50.00			58.50

Table 8. 2017-2018 Assessment based on data collected since Spring 2016

Institutional Graduate Learning Goal (IGLGs)	Contributing PLOs	Assessment Averages
1. Disciplinary knowledge	1	92.59
2. Communication	4	67.00
3. Critical thinking/analysis	2, 3	85.07
4. Information literacy	2, 5	
5. Professionalism	6	58.50
6. Intercultural/Global Perspectives	5, 6	58.50

Appendix: Supporting Materials

CSc 255

CSC 255 Fall 2016

PLO*	Below Expectation	Meets expectation	Exceeds Expectation	Below Expectation (%)	Meets expectation (%)	Exceeds Expectation (%)	M+E
1	1	2	2	20.0	40.0	40.0	80.0
3	0	1	3	0.0	25.0	75.0	100.0

PLO1:	Problem Solving (Exam Problems and 1 Assignment)
PLO3:	Creative Thinking (Term Project)

*based on 5 CpE students in CSC255 in Fall 2016

CSc/EEE 273

CSc/EEE 273 Spring 2016

PLO*	Below Expectation	Meets expectation	Exceeds Expectation	Below Expectation (%)	Meets expectation (%)	Exceeds Expectation (%)	M+E
1	2	2	5	22.2	22.2	55.6	77.8
3	0	3	6	0.0	33.3	66.7	100.0

PLO1:	Problem Solving (Final Exam Problems)
PLO3:	Creative Thinking (Term Project)

*based on 9 CpE students in CSC/CpE273 in Spring 2016

EEE 234

EEE 234 – Digital IC Design - Assessment Results (CpE students)

Course Outcomes :

- CO_1 Students will be able to apply basic semiconductor device physics that dictate the operation of CMOS circuits
- CO_2 Students will be able to analyze and design CMOS logic gates at the transistor level, including memory
- CO_3 Students will be able to make tradeoffs between performance, power, and area for CMOS digital circuits
- CO_4 Students will be able to use a professional style physical design tool to layout CMOS logic circuits
- CO_5 Students will be able to describe issues and make tradeoffs associated with large "system on a chip" designs

- Key to Results :**
- 3 = Exceeds expectations (80% and above)
 - 2 = Meets expectations (60% to 80%)
 - 1 = Below expectations (below 60%)

		Academic Year 2015-2016						
		Fall 2015			Spring 2016			
Course outcomes & Assessment method	Course not taught during this semester	Result (number)			Result (percent)			3+2
		3	2	1	3	2	1	
CO_1 : see note 1 below		3	0	1	75.00	0.00	25.00	75.00
CO_2 : see note 2 below		2	0	2	50.00	0.00	50.00	50.00
CO_3 : see note 3 below		4	0	0	100.00	0.00	0.00	100.00
CO_4 : see note 4 below		4	0	0	100.00	0.00	0.00	100.00
CO_5 : see note 5 below		4	0	0	100.00	0.00	0.00	100.00
MS PLO1: CO1, CO2								62.50
MS PLO3: CO3, CO4, CO5								100.00

Notes:

1. CO_1 was checked on midterm exam questions 21-25
2. CO_2 was checked on midterm exam questions 26-30
3. CO_3 was checked on project 2, phase 1 (circuit design)
4. CO_4 was checked on project 2, phase 2 (layout design)
5. CO_5 was checked on final exam questions 3-4, 13-14, 24-26

Relationship of EEE 234 Course Outcomes to CpE Graduate PLOs :

- CpE PLO 1. Problem Solving : CO_1, CO_2
- CpE PLO 2. Critical thinking : None
- CpE PLO 3. Creative thinking : CO_3, CO_4, CO_5
- CpE PLO 4. Written communication : None
- CpE PLO 5. Integrative and applied learning : None
- CpE PLO 6. Civic knowledge and engagement : None



SACRAMENTO
STATE

Assessment Plans

for

Computer Engineering Programs

Spring 2015

Introduction

The CpE B.S and M.S. degree programs at California State University, Sacramento are joint programs supported by both the Computer Science (CSc) and Electrical and Electronics Engineering (EEE) departments. The Computer Engineering (CpE) faculty members (including the CpE coordinator) are appointed in either the CSc or EEE department.

This report describes the processes used by the CpE faculty to monitor and assess the Program Educational Objectives (PEOs) and Student Outcomes (SOs) for the B.S. degree program – both of which have been established according to due process and the guidelines of ABET, the accrediting agency. This report also describes the processes used by the CpE faculty to assess the PEOs and SOs of the CpE M.S. degree program.

The SOs are defined as the knowledge and those skills that students should be able to demonstrate at the time of their graduation, and the PEOs are those professional characteristics that students should be able to demonstrate approximately five years after graduation. The processes to periodically review the PEOs and assess the SOs are also described.

B.S. Program Educational Objectives (PEOs)

The list of PEOs for the Computer Engineering B.S. degree is as follows:

1. *Core Knowledge*: Our graduates will have careers in computer engineering, or be engaged in a related career path.
2. *Application of Knowledge*: Our graduates will apply their knowledge and skills to solve practical engineering problems.
3. *Life-long Learning*: Our graduates will continue to develop their skills and seek knowledge after graduation in order to adapt to advancing technology and the needs of society. This may be indicated by the graduate's pursuit of an advanced degree or other formal instruction, and/or that the graduate has developed a professional specialty.
4. *Professionalism*: Our graduates will have the necessary professional skills, such as high ethical standards, effective oral and written communications, and teamwork, to be productive engineers and to advance in their careers.

B.S. Student Outcomes (SOs)

Excerpted from ABET General Criteria 3 for Accreditation of Engineering Programs, 2015-2016

“The program must have documented student outcomes that prepare graduates to attain the program educational objectives. Student outcomes are outcomes (a) through (k) plus any additional outcomes that may be articulated by the program.”

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs within realistic

constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

(d) an ability to function on multidisciplinary teams

(e) an ability to identify, formulate, and solve engineering problems

(f) an understanding of professional and ethical responsibility

(g) an ability to communicate effectively

(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

(i) a recognition of the need for, and an ability to engage in life-long learning

(j) a knowledge of contemporary issues

(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Constituencies of CpE Programs

The students, Alumni, employers, and faculty as a whole are the four major constituencies of the CpE programs.

Students and Alumni

The mission of the CpE Program at CSUS is to provide our students with high quality education with the necessary knowledge, skills, and abilities at the time of graduation to transform our graduates into professionals who are prepared to meet the needs of society and adapt to rapidly changing technology. CSUS has a diverse student body from a wide range of cultures and socioeconomic backgrounds and our current students as well as our graduates are the primary constituents of our program.

Employers

Computer related industries are the primary employers of graduates from the CpE Program. Our graduates enter a competitive market wherein such employers seek candidates with strong technical and communication skills as well as an ability to thrive within current industry standards and to address the challenges of the future. Our employers are in a unique position to reflect on the talents, abilities and skills that are necessary for our graduates to succeed in the workplace. Experienced employees from the local industries are invited to form the CpE Industry Advisory Council (IAC).

Faculty

Faculty at-large represent one of the important constituents of the program and they are directly responsible for the education of our students and ensuring that they are prepared to meet the educational objectives of our program. The Office of Academic Program Assessment defines undergraduate learning goals and provides university-wide assessment guidelines and requirements and the College of Engineering and Computer Science

Assessment Committee provides additional guidelines for the Engineering programs in the College. The CpE faculty is involved directly by providing course outlines, creating course goals and objectives, assessing student outcomes, and closing the loop. Individual faculty members make minor changes within individual courses, while the entire CpE faculty acts upon major curriculum changes resulting from evaluation of the outcomes assessments.

B.S. PEOs Review Process

Figure 1 illustrates the process to periodically review and update the B.S. degree PEOs. The CpE faculty members receive inputs from various on campus committees, the program constituents, and ABET accrediting body to continuously review and assess the relevance of the PEOs. The Office of Academic Program Assessment defines the University Educational Goals and provides the campus wide assessment guidelines. The goals of the College Assessment Committee is for each Engineering program to exchange and share sound assessment practices and develop college-wide assessment standards and guidelines. The inputs from the CpE Industrial Advisory Council (IAC) meetings, site visits with local industries, student and Alumni, and ABET are used to periodically evaluate the relevance of the PEOs with respect to university and college mission, the needs of the industry, and requirements of the accreditation.

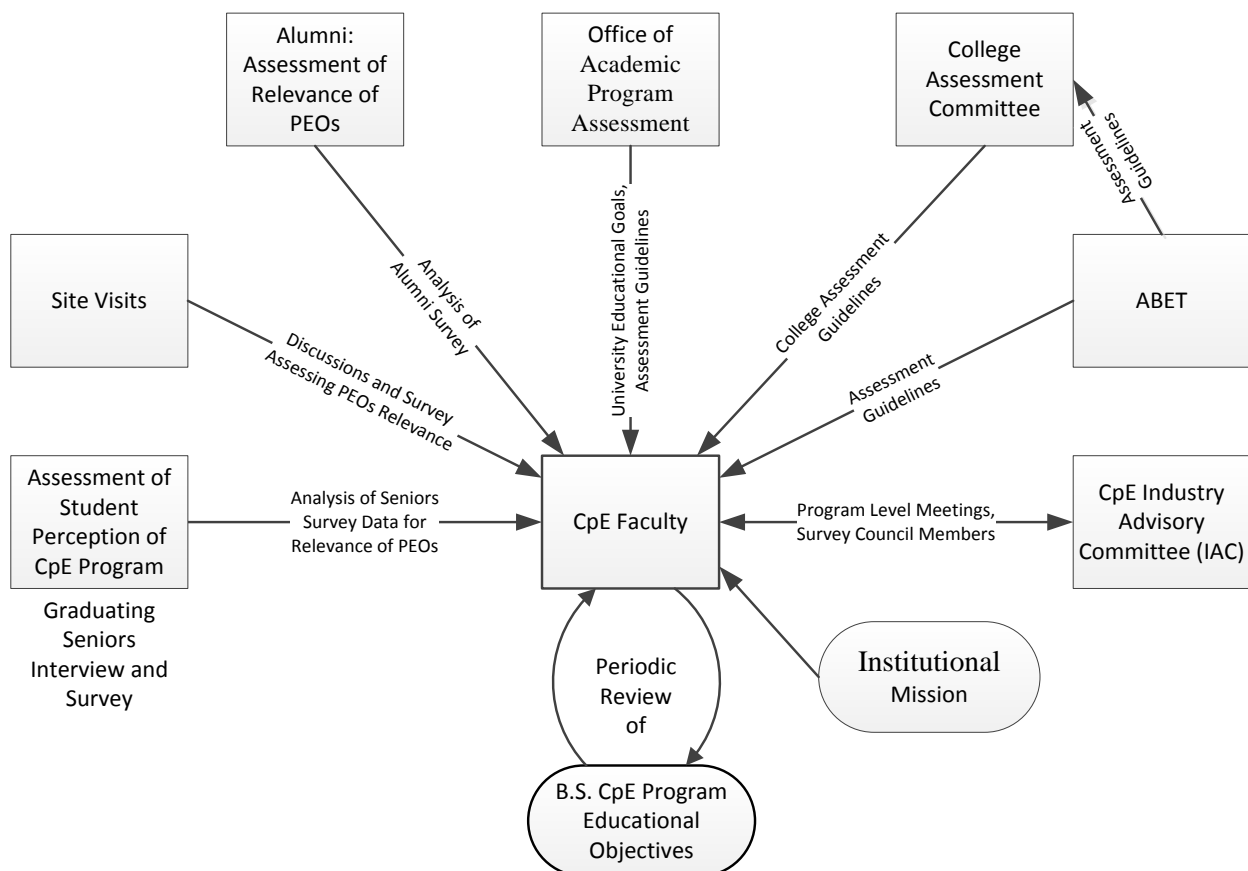


Figure 1 Flowchart of B.S. Program Educational Objectives Assessment

Table 1 outlines the methodologies used to periodically review the PEOs using the various inputs CpE faculty receive as shown in Figure 1.

Table 1 Process to Periodically Review B.S. Degree Program Educational Objectives

Constituent	Methodology	Inputs
Students	Graduating Senior Exit Interview and Survey (Sample list of graduating seniors interviewed every semester)	Verbal student recommendations; Seniors shall be asked to rate their perception of the CpE program in terms of the knowledge, skills, and abilities relating to the PEOs.
Alumni	Alumni survey, once every 3-5 years.	Survey collected by the Office of Institutional Research (OIS). The Alumni shall be asked to rate the relative importance of the PEOs as Essential, Important, Desirable, or Not Relevant.
Employers	The Industry Advisory Council (IAC) meetings, once every year; Site visits, one per year.	IAC meeting discussions and survey: The industry members of the Council shall rate the relevant importance of the PEOs as Essential, Important, Desirable, or Not Relevant. Members shall add additional objectives (if any) and also rate their relative importance. Company site visits and survey: The managers and Alumni/employees attending shall be asked to rate the relative importance of the PEOs, add and rate new objectives (if any), and provide recommendations to improve the program.
University/ College	Office of Academic Program Assessment; College Assessment Committee	University educational goals updates, University assessment guideline updates, College assessment guidelines updates
CpE Faculty	Faculty meetings to review PEOs based on the data and inputs received over the past three years	Analysis of Alumni, IAC, and site visits survey results, Evaluation of University, College, and/or ABET assessment guidelines updates

B.S. Degree SOs Assessment Process

The CpE B.S. degree curriculum includes math and science courses as well as CpE, CSc, EEE, and Engineering (ENGR) prefixed courses that are taught by faculty members from the CSc and EEE departments. The assessment of the CpE program relies on the assessment data received from the two departments where each department uses a different assessment methodology as outline below.

The EEE department uses a set of performance indicators, called Course Outcomes (COs), to assess (when applicable) all or a set of SOs in each course, and the CSc department uses a set of performance indicators from all the courses to assess the SOs for the entire program. The CSc department does not assess SOs in each course. In both cases the assessment instruments are direct and include exam questions, assignments, and/or projects.

For each course where COs are assessed the assessment data is first mapped to SOs using the template shown in Table 2 (Course SOs), where an “X” in any cell would indicate how an SO is assessed in each course. Two or more X’s in a single column would indicate the SO is assessed using multiple COs. The data from all such maps is mapped to all the SOs, as illustrated in Table 3, to assess the CpE Program SOs, as required by ABET.

Table 2 Course SOs: Example Mapping Course Outcomes to Student Outcomes (for Courses Taught By EEE Department)

Course Outcome (CO)	Student Outcome (SO)										
	a	b	c	d	e	f	g	h	i	j	k
1											
2											
3											
4											
...											

Place an X in each cell where the Course Outcome assesses the Student Outcome.

For courses that performance indicators are used to assess the SOs for the entire program, the assessment instruments (exam questions, assignments, and/or projects) directly measure the performance of each student on each of the indicators. Multiple indicators from multiple courses are used to assess all the SOs, as also illustrated in Table 3. The quantitative assessment results in Table 3 as well as the inputs from the College Assessment Committee and ABET are used for continuous improvement of the SOs as illustrated by the flowchart shown in Figure 2.

**Table 3 CpE Program SOs: Example Mapping of CSc Performance Indicators (PIs) and
EEE Course Outcomes (COs) to CpE Student Outcomes (SOs)**

Student Outcome (SO)	Courses Taught by CSc Faculty				Courses Taught by EEE Faculty			
	Course 1 PIs	Course 2 PIs	Course 3 PIs	...	Course A COs	Course B COs	Course C COs	...
a								
b								
c								
d								
e								
f								
g								
h								
i								
k								

Place an X in each cell where a set of performance indicators CSc department or Course Outcomes from EEE department assesses a Student Outcome (SO).

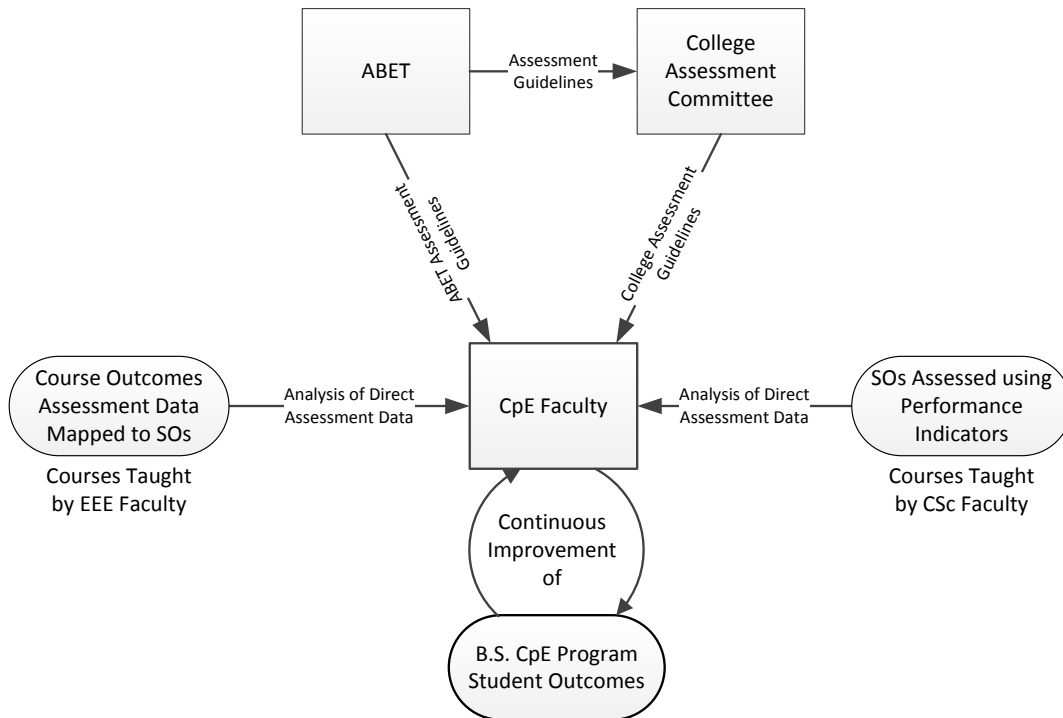


Figure 2 Flowchart of B.S. Student Outcomes Assessment

Assessment of CpE Graduate Programs

The CpE M.S. degree requirements includes Plan A (Masters Project), Plan B (Thesis), or Plan C (Comprehensive Exam).

M.S. Program Educational Objectives

1. Graduates will be capable of integrating undergraduate fundamentals and advanced knowledge to solve complex Computer Engineering related problems
2. Graduates will be prepared for professional advancement in computer engineering. They will have the ability to pursue continuous learning and identify, understand, and apply new knowledge within the field.
3. Graduates will have the ability to undertake a research and development project and to document the work in clear and effective manner, appropriate to the standards in the field.
4. Graduates will have the ethics and the communication skills to be an effective team member.

The process used to periodically review the M.S. PEOs is shown in Figure 3.

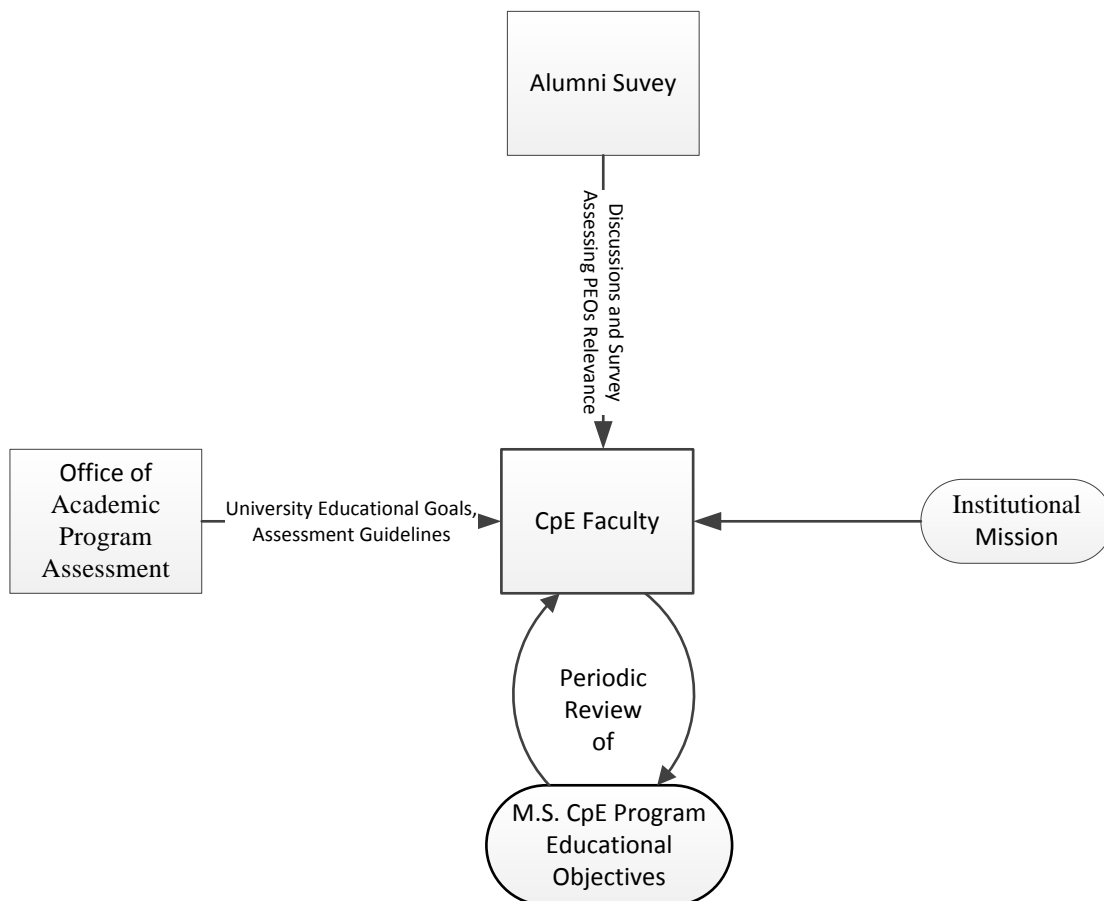


Figure 3 Flowchart of M.S. Program Educational Objectives Assessment

M.S. Student Outcomes

- a. Problem Solving: Graduates apply knowledge from their undergraduate and graduate computer engineering studies and related disciplines to solve complex computer engineering problems that require advanced knowledge within the field.
- b. Critical thinking: Graduates understand and integrate new knowledge within the field.
- c. Creative thinking: Graduates can plan and conduct projects on advanced topics within the field.
- d. Written communication: Graduates can report on advanced topics within the field.
- e. Integrative and applied learning: Graduates can work as a team in a diverse changing world.
- f. Civic knowledge and engagement: Graduates recognize the ethical standards, and possess skills for effective communication.

Figure 4 illustrates the process used to assess the M.S. degree SOs.

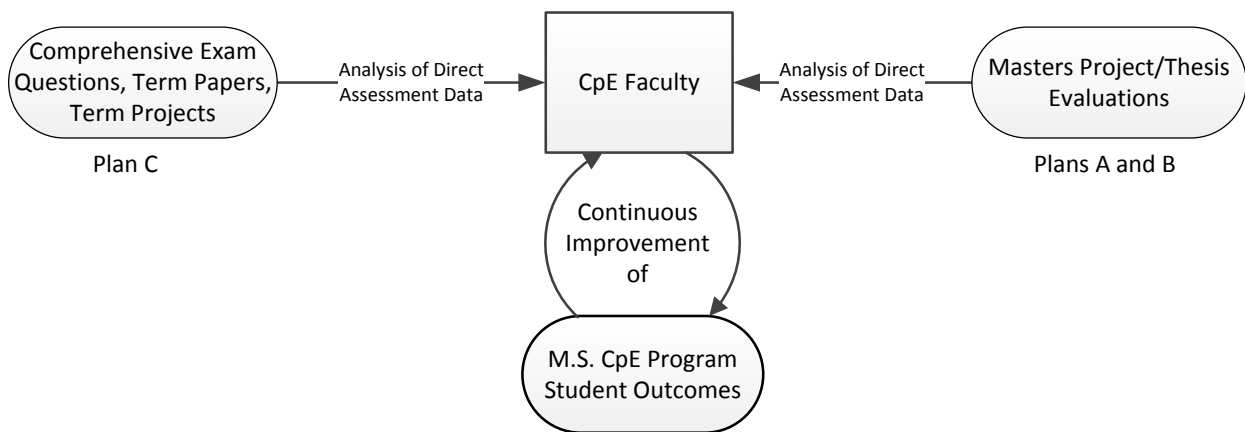


Figure 4 Flowchart of M.S. Student Outcomes Assessment

From 21.1, MS Curriculum Map

The following is not organized like a curriculum map by semesters because in the graduate program a few courses are prerequisites to other courses. The outline below outlines how students would need to fill their graduate degree requirements consisting of 11 units core, 6 to 12 units breadth requirements, 6 units of electives, and 0 to 5 units of culminating experience as comprehensive exam, masters' project, or thesis work.

- A. Required Core Courses (11 units)
- B. Required Breadth Courses (6 - 12 units)
- C. CSC Elective (3 units)
- D. EEE Elective (3 units)
- E. Culminating Requirement (0-5 units)