2016-2017
Annual Assessment Report Template

For instructions and guidelines 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

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**]

- [x] 1. **Critical Thinking**
- [ ] 2. **Information Literacy**
- [ ] 3. **Written Communication**
- [ ] 4. **Oral Communication**
- [ ] 5. Quantitative Literacy
- [ ] 6. **Inquiry and Analysis**
- [x] 7. Creative Thinking
- [ ] 8. Reading
- [ ] 9. Team Work
- [x] 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**
- [x] 19. **Professionalism**
- [ ] 20. Other, specify any assessed PLOs not included above:

a.
b.
c.

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 "CpE related document - assessment 2016-2017 - MS Program." The specific information about the PLOs are provided in Sections I to III.

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:

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)

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 (Creative Thinking) assesses the students' abilities to plan, conduct, and report on term projects in advanced topics in computer engineering. Students are required to design and model hardware often using Computer Aided Engineering (CAE) tools that meet the design requirements and specifications.

Q2.2.
Has the program developed or adopted **explicit** standards of performance for this PLO?

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

Q2.3.
Please **provide the rubric(s)** and **standards of performance** that you have developed for this PLO here or in the appendix.

For CSc courses 70% and for EEE courses 60% threshold is used as the standard for meeting the criteria. Also refer to Section IV (Assessment Results) in the attached document.

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** of performance, and the **rubric** that was used to measure the PLO:
☐	☐	☐	1. In **SOME** course syllabi/assignments in the program that address the PLO
☐	☐	☐	2. In **ALL** course syllabi/assignments in the program that address the PLO
☐	☐	☐	3. In the student handbook/advising handbook
☐	☐	☐	4. In the university catalogue
☑	☐	☐	5. On the academic unit website or in newsletters

☐	☐	☐	6. In the assessment or program review reports, plans, resources, or activities
☐	☐	☐	7. In new course proposal forms in the department/college/university
☐	☐	☐	8. In the department/college/university's strategic plans and other planning documents
☐	☐	☐	9. In the department/college/university's budget plans and other resource allocation documents
☐	☐	☐	10. Other, specify:

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?

1

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:

The assessment data was collected on term projects in four courses CpE 201, CSc 255, CSc/EEE 273, EEE 234, and EEE 270. However, because there were only 2 CpE students in EEE 270, the assessment results for EEE 270 were not calculated as part of the average to determine the number of students meeting or exceeding the criteria. Likewise, there was only 1 student in CpE 201-S17 semester and the assessment result was not used in the average.

(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
- [x] 2. Key assignments from required classes in the program
- [x] 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 **provide** the direct measure (key assignments, projects, portfolios, course work, student tests, etc.) you used to collect data, THEN **explain** how it assesses the PLO:

Term projects in several courses were used to assess creative thinking abilities of the students. Also see Q2.1.1.

CpE related document - assessment 2016-2017 - MS Program.pdf
338.43 KB

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: (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.
How many faculty members participated in planning the assessment data **collection** of the selected PLO?

Eight faculty members, 4 from CSc and 4 from EEE departments

Q3.5.1.
How many faculty members participated in the **evaluation** of the assessment data for the selected PLO?

Eight faculty members, 4 from...

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.)?

The work of all CpE students in CpE 201, CSc 255, CSc/EEE 273, EEE 234, and EEE 270 that they took the course in Spring 2016 or Fall 2016 were assed. Some of the courses are offered once a year.

Q3.6.1.
How did you **decide** how many samples of student work to review?

Assessed all the students' work.

Q3.6.2.
How many students were in the class or program?

5 in CSc 255,
9 in CSc/EEE 273,
4 in EEE 234, and

Q3.6.3.
How many samples of student work did you evaluated?

All of them

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:

No file attached 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, what was 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 simple tables and/or graphs to summarize the assessment data, findings, and conclusions for the selected PLO in **Q2.1**:

Please refer to Section IV in the attached document. File was already attached.

No file attached 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?

The assessment result from the three courses (CSc 255, CSc/EEE 273, and EEE 234), where two are taught by CSc faculty members and one is taught by a EEE faculty member, all indicate 100% of the assessed students meet or exceed the criteria for PLO 3 (Creative Thinking). This indicates that CpE graduate students are able to demonstrate their abilities in design and modeling of computer hardware components. Also, refer to Section IV (Assessment Results) in the attached document for additional information.

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. Include a description of how you plan to assess the impact of these changes.

No changes is planned for assessing PLO 3.

However, as shown in Table 6 in the attached document, the assessment result for PLO 6 (Civic knowledge and engagement) in the attached document indicate that only 40% of the students met or exceeded the criteria. The instructor for the course has plans to put more emphasis on these topics during 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
- ( ) 2. No
- ( ) 3. Don't know

Q5.2.

Since your last assessment report, **how have the assessment data from then been used** so far?	1. Very Much	2. Quite a Bit	3. Some	4. Not at All	5. N/A
1. Improving specific courses	○	○	○	○	○
2. Modifying curriculum	○	○	○	○	○
3. Improving advising and mentoring	○	○	○	○	○
4. Revising learning outcomes/goals	○	○	○	○	○
5. Revising rubrics and/or expectations	○	○	○	○	○
6. Developing/updating assessment plan	○	○	○	○	○
7. Annual assessment reports	○	○	○	○	○
8. Program review	○	○	○	○	○
9. Prospective student and family information	○	○	○	○	○
10. Alumni communication	○	○	○	○	○
11. WSCUC accreditation (regional accreditation)	○	○	○	○	○
12. Program accreditation	○	○	○	○	○
13. External accountability reporting requirement	○	○	○	○	○
14. Trustee/Governing Board deliberations	○	○	○	○	○
15. Strategic planning	○	○	○	○	○
16. Institutional benchmarking	○	○	○	○	○
17. Academic policy development or modifications	○	○	○	○	○
18. Institutional improvement	○	○	○	○	○
19. Resource allocation and budgeting	○	○	○	○	○
20. New faculty hiring	○	○	○	○	○
21. Professional development for faculty and staff	○	○	○	○	○
22. Recruitment of new students	○	○	○	○	○

23. Other, specify: No specific assessment data was collected last year, only the assessment document was created.

Q5.2.1.
Please provide a detailed example of how you used the assessment data above:

N/A

Q5.3. To what extent did you apply **last year's feedback** from the Office of Academic Program Assessment in the following areas?	1. Very Much	2. Quite a bit	3. Some	4. Not at All	5. N/A
1. Program Learning Outcomes	○	○	○	○	○
2. Standards of Performance	○	○	○	○	○
3. Measures	○	○	○	○	○
4. Rubrics	○	○	○	○	○
5. Alignment	○	○	○	○	○
6. Data Collection	○	○	○	○	○
7. Data Analysis and Presentation	○	○	○	○	○
8. Use of Assessment Data	○	○	○	○	○
9. Other, please specify:	○	○	○	○	○

Q5.3.1.
Please share with us an example of how you applied **last year's feedback** from the Office of Academic Program Assessment in any of the areas above:

N/A

(Remember: Save your progress)

Additional Assessment Activities

Q6.
Many academic units have collected assessment data on aspect of their program *that are not related to the PLOs* (i.e. impacts of an advising center, etc.). **If** your program/academic unit has collected data on program *elements*, please briefly report your results here:

None

No file attached No file attached

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
- [x] 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**
- [x] 19. **Professionalism**
- [ ] 20. Other, specify any PLOs not included above:

a.
b.
c.

Q8. Please attach any additional files here:

CpE assessment documments 2016-2017-MS Program.zip
782.93 KB

No file attached No file attached No file attached

Q8.1.
Have you attached any files to this form? If yes, please list every attached file here:

1. CpE related document - assessment 2016-2017 - MS Program.pdf

2. CpE Assessment Plans Spring 2015 Final.pdf

3. Graduate Learning Goals_Objectives Spring 2017 Final.pdf

Program Information (**Required**)

Program:

(If you typed your program name at the beginning, please skip to Q10)

Q9.
Program/Concentration Name: [skip if program name appears above]
MS Computer Engineering

Q10.
Report Author(s):
Nikrouz Faroughi

Q10.1.
Department Chair/Program Director:
Nikrouz Faroughi, Program Coordinator

Q10.2.
Assessment Coordinator:
Nikrouz Faroughi

Q11.
Department/Division/Program of Academic Unit
Computer Engineering

Q12.
College:
College of Engineering and Computer Science

Q13.
Total enrollment for Academic Unit during assessment semester (see Departmental Fact Book):
35

Q14.
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:

Q15. Number of **undergraduate degree programs** the academic unit has?
1

Q15.1. List all the names:

Computer Engineering

Q15.2. How many concentrations appear on the diploma for this undergraduate program?

0

Q16. Number of **master's degree programs** the academic unit has?

1

Q16.1. List all the names:

Computer Engineering. Regarding Q22.1, the program offers Maters Project/Thesis or Plan C exam.

Q16.2. How many concentrations appear on the diploma for this master's program?

0

Q17. Number of **credential programs** the academic unit has?

0

Q17.1. List all the names:

Q18. Number of **doctorate degree programs** the academic unit has?

0

Q18.1. List all the names:

When was your **assessment plan**...	1. Before 2011-12	2. 2012-13	3. 2013-14	4. 2014-15	5. 2015-16	6. 2016-17	7. No Plan	8. Don't know
Q19. developed?	○	○	○	○	◉	○	○	○
Q19.1. last updated?	○	○	○	○	○	◉	○	○

Q19.2. (REQUIRED)
Please **obtain** and **attach** your latest **assessment plan**:

Graduate Learning Goals_Objectives Spring 2017 Final.pdf
230.67 KB

Q20.
Has your program developed a **curriculum map?**

◉ 1. Yes
○ 2. No
○ 3. Don't know

Q20.1.
Please **obtain** and **attach** your latest **curriculum map**:

No file attached

Q21.
Has your program indicated in the curriculum map where assessment **of student learning** occurs?

◉ 1. Yes
○ 2. No
○ 3. Don't know

Q22.
Does your program have a capstone class?

○ 1. Yes, indicate:
◉ 2. No
○ 3. Don't know

Q22.1.
Does your program have **any** capstone project?

○ 1. Yes
○ 2. No
○ 3. Don't know

(**Remember**: **Save your progress**)

ver. 5.15/17

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 leaning 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.

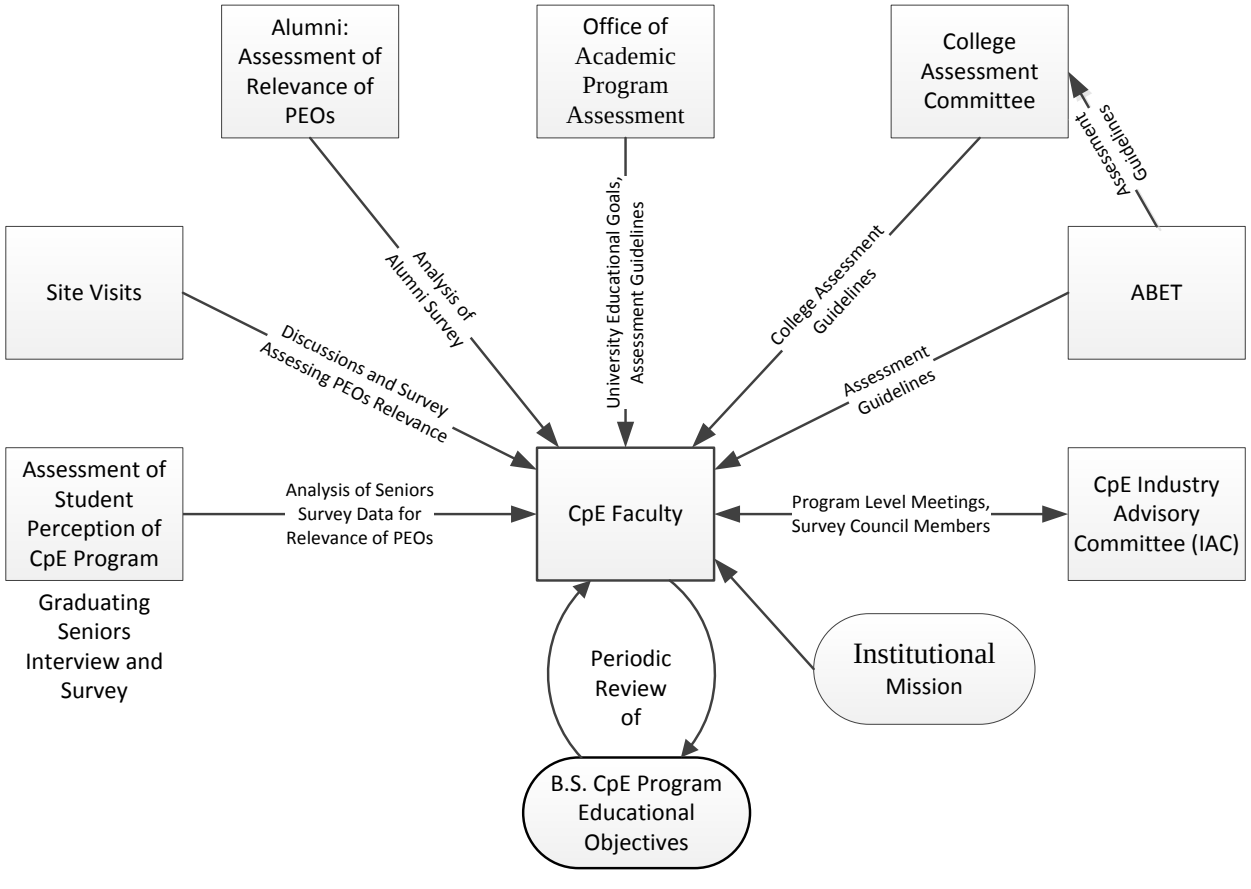

Figure 1 Flowchart of B.S. Program Educational Objectives Assessment

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).

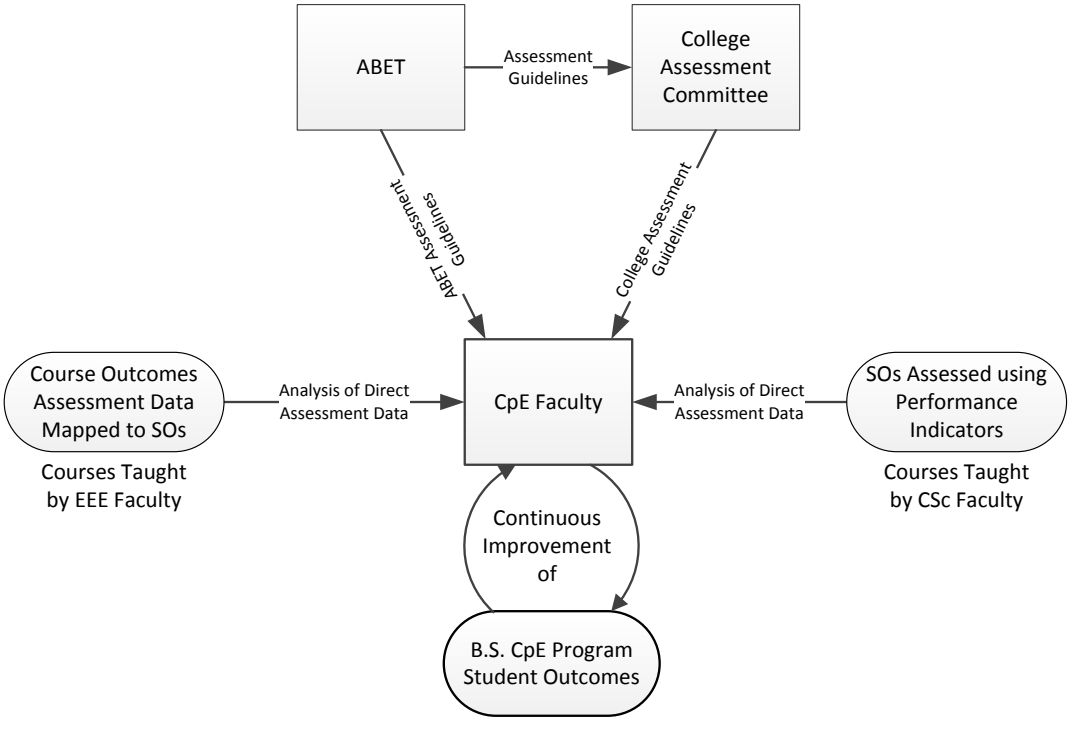

Figure 2 Flowchart of B.S. Student Outcomes Assessment

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.

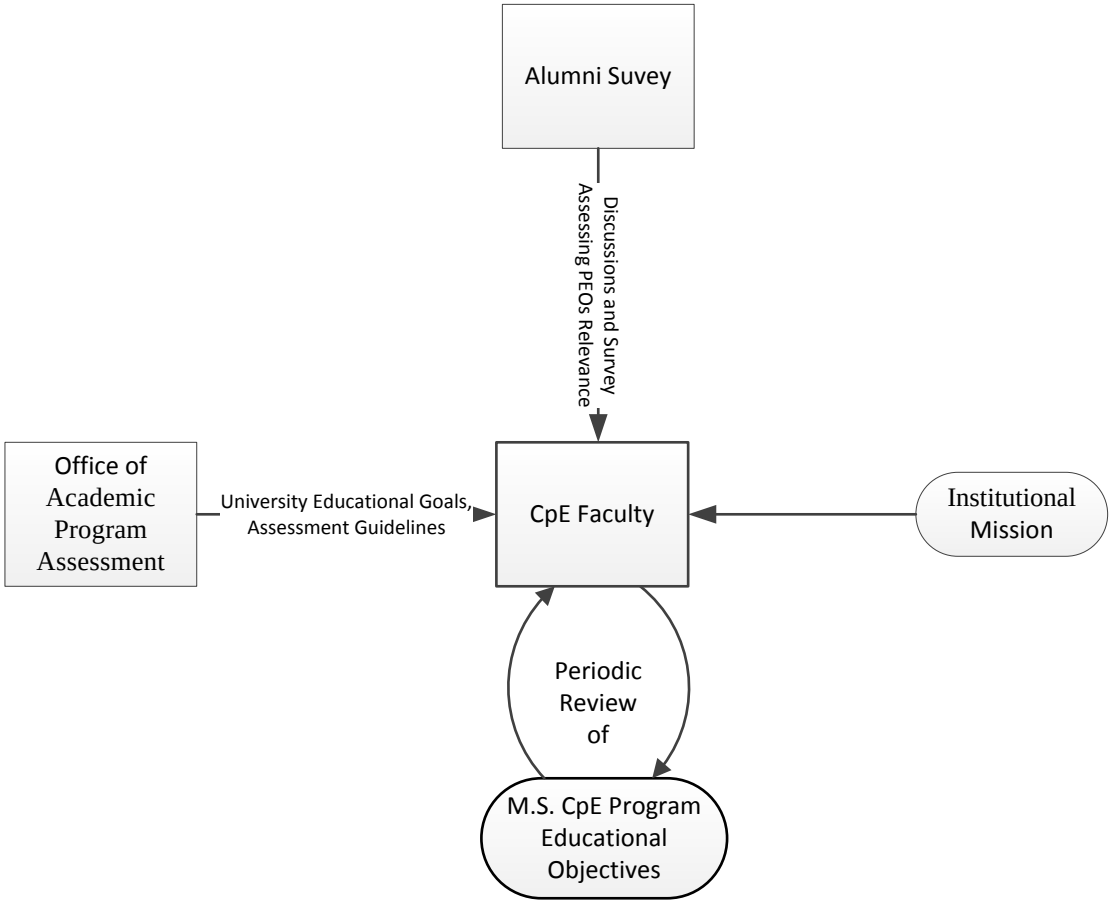

Figure 3 Flowchart of M.S. Program Educational Objectives Assessment

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: Gradates recognize the ethical standards, and possess skills for effective communication.

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

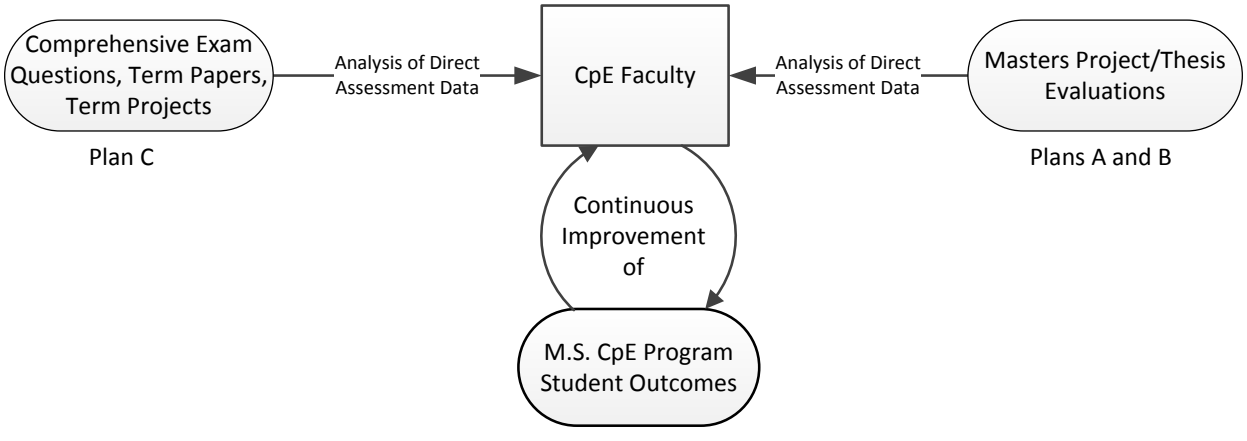

Figure 4 Flowchart of M.S. Student Outcomes Assessment

Computer Engineering

Graduate Learning Goals/Objectives Policy

The Faculty Senate recommends that departments/interdisciplinary groups with graduate programs in their purview be required to establish Graduate Goals/Objectives, Program Learning Outcomes with an associated curriculum map, and an assessment plan with an associated action plan, to be submitted to the Office of Graduate Studies within one full academic year of approval of this policy (Approved in May 2015). Items in *italics* are additional elements being requested to assist with institutional level data collection.

Graduate Learning Goals/Objectives and Program Learning Outcomes

The Faculty Senate further recommends that in developing graduate learning goals/objectives, faculty consult resources such as the information submitted in the Instructional Program Priorities (IPP) process, the Graduate Learning Goals recommended by the Graduate Studies Policies Committee, and/or the Lumina Foundation Degree Qualifications Profile in framing their learning goals/objectives and assessment components.

Graduate programs shall develop Program Learning Outcomes (PLOs) that represent their unique perspectives. Each graduate program shall define its own set of learning outcomes, specific to the level of study and to the discipline, which are clearly more advanced in content than those defined for related undergraduate work. For some programs, these might already be defined, at least in part, by external accrediting agencies. Such defined outcomes shall also form the basis for assessment plans within graduate programs and offer foci for future academic program review terms.

Program Learning Outcomes are designed with the goal of placing graduated master's or doctoral students into post-degree positions in secondary education, non-profits, business and consulting, government and private agencies, and other fields that draw on the knowledge and skills of graduates in the focused areas of their degree preparation.

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: Gradates 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. Mapping of CpE Program Learning Outcomes to Institutional Graduate Learning Goals for Masters Programs.

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		X	X		
2. Critical thinking	X		X	X		
3. Creative thinking	X		X	X		
4. Written communication		X				
5. Integrative and applied learning	X		X	X		
6. Civic knowledge and engagement		X			X	X

Curriculum Map

Each program shall create a curriculum map:

1. List all courses, both required and elective, as well as other required graduate education activities.
2. Indicate where in the curriculum each PLO is addressed through development of a curriculum map. The curriculum map may be presented in many formats, including tabular form as the template below. Another format may be substituted
3. *Please indicate if the course is a core (C), an elective (E), or culminating experience (Thesis, Project, or Comprehensive Examination) course.*

Course Work	**PLO 1 (e.g., exam, homework)**	**PLO 2 (e.g., exam, research paper, project)**	**PLO 3 (e.g., project)**	**PLO 4 (e.g., research paper, project)**	**PLO 5**	**PLO 6**
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				

* Taught by a part timer, have Suresh's mapping for EEE 285.

Assessment Plan

Each graduate program shall develop a plan for assessing student achievement of its Program Learning Outcomes:

1. *Indicate the date assessment of the PLO started and identify each PLO separately in the Assessment Plan*.
2. Identify graduate program-specific direct and indirect lines of evidence for each of the PLOs. (See the policy for summaries of the kinds of direct and indirect evaluative data programs might draw on to assess progress towards and achievement of PLOs).
3. *Please indicate the lead personnel associated with evaluating each PLO.*
4. *Articulate evaluation parameters for measuring introductory and advanced levels of graduate student development for each PLO and the timeline for* measurement, e.g., at time of admission or prior to culminating experience coursework.

Courses taken during the 1st year will be used to measure introductory levels of student development for each PLO and courses taken after the 1st year will be used to measure advanced levels of student development for each PLO. Because many graduate courses do not have graduate courses as prerequisites, each course may include 1st year as well as those who are no longer 1st year graduate students. Exam, project, etc. scores of 1st year graduate students will be kept separate from the others so the 1st year PLO measurement data can be compared with the data collected from those who are no longer 1st year graduate students.

5. Evaluate each of the PLOs based on direct lines of evidence, collectively supporting the evaluation of introductory and advanced levels of development over the course of each student's program trajectory. Emphasis should be placed on early assessment of indicators that predict success in the graduate experience.

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	1st year vs. 2nd year graduate students (O)	
	2: Critical Thinking			Course Instructor	1st year vs. 2nd year graduate students (O)	Research Paper (assessing the content)
	3: Creative Thinking			Course Instructor	1st year vs. 2nd year graduate students (O)	Projects (e.g., assessing the quality of student work in class projects)
	4: Written Communication			Course Instructor	1st 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		1st year vs. 2nd year graduate students (O), F	
Every 3 years	5: Integrative and applied learning		Course instructor, Alumni Survey		1st year vs. 2nd year graduate students (O), F	
	6: Civic knowledge and engagement		Alumni Survey		F	

Action Plan

Based on the assessment data collected, each graduate program shall provide detailed information about action steps to be taken to maintain program quality and/or address identified deficiencies.

1. Assessment Data Summary
2. Evaluation
3. Actions for Program Improvements and/or Continuation

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 access 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 access 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	Access students' abilities to plan and conduct projects.
5: Integrative and applied learning	Alumni Survey	Alumni access their job-related performance especially their teamwork skills	Use survey data to access graduates' abilities to work effectively in a diverse and changing world.
6: Civic knowledge and engagement	Alumni Survey	Alumni access their job-related performance	Use survey data to access graduates' abilities to communicate and function

		especially their professionalism and communication skills	effectively according to the common norms in a professional environment.

Computer Engineering Assessment Related Document 2016-2017

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 s 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. Mapping of CpE Program Learning Outcomes to Institutional Graduate Learning Goals (IGLGs) for Masters Programs.

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		X	X		
2. Critical thinking	X		X	X		
3. Creative thinking	X		X	X		
4. Written communication		X				
5. Integrative and applied learning	X		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**	**PLO 6: Civic knowledge and engagement** (e.g., ethical standards,

					(e.g., teamwork, etc.)	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

Courses taken during the 1st year will be used to measure introductory levels of student development for each PLO and courses taken after the 1st year will be used to measure advanced levels of student development for each PLO. Because many graduate courses do not have graduate courses as prerequisites, each course may include 1st year as well as those who are no longer 1st year graduate students. Exam, project, etc. scores of 1st year graduate students will be kept separate from the others so the 1st year PLO measurement data can be compared with the data collected from those who are no longer 1st year graduate students.

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	1st year vs. 2nd year graduate students (O)	
	2: Critical Thinking			Course Instructor	1st year vs. 2nd year graduate students (O)	Research Paper (assessing the content)
	3: Creative Thinking			Course Instructor	1st year vs. 2nd year graduate students (O)	Projects (e.g., assessing the quality of student work in class projects)
	4: Written Communication			Course Instructor	1st 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		1st year vs. 2nd year graduate students (O), F	
Every 3 years	5: Integrative and applied learning		Course instructor, Alumni Survey		1st 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 access 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 access 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	Access students' abilities to plan and conduct projects.
5: Integrative and applied learning	Alumni Survey	Alumni access their job-related performance especially their teamwork skills	Use survey data to access graduates' abilities to work effectively in a diverse and changing world.
6: Civic knowledge and engagement	Alumni Survey	Alumni access their job-related performance especially their professionalism and communication skills	Use survey data to access 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 s recognize the ethical standards, and possess skills for effective communication.

CSc/EEE 242

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.

		MS Program PLOs					
		PLO1	**PLO2**	**PLO3**	**PLO4**	**PLO5**	**PLO6**
Course Outcomes	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 270 and CpE 201-S17 in the calculation of the average due to the small number of students in the courses. The assessment results indicate that 75% and 100% of the students meet or exceed the criteria for PLO 1 (problem solving) and PLO 3 (Creative Thinking), respectively. PLO2 (Critical Thinking) was assessed in one course (CpE 201-F16) where 80% of the students met or exceeded the criteria. Likewise, PLO 4 (Written communication) was assessed in one course where 93% of the students met or exceeded the criteria. PLO 6 (Civic knowledge and engagement) was also assessed in one course (CpE 201-F16) where only 40% of the students met or exceeded the criteria. The instructor for this course has plans to put more emphasis on these topics during the next academic year. Note, the CSc and EEE departments use 70% and 60%, respectively, as the thresholds for meeting the criteria.

Table 6. CpE MS Program Assessment 2016-2017: Individual Course Assessment Data

Student Outcome	Courses Taught by CSc		Courses Taught by EEE				Average
	CSc 255	CSc/EEE 273	EEE 234	CpE 201-F16	CpE 201-S17*	EEE 270*	
1. Problem Solving	**80.00**	**77.78**	**62.50**	**80.00**	**100.00**	100	**75.07**
2. Critical thinking				**80.00**	**100.00**		**80.00**
3. Creative thinking	**100.00**	**100.00**	**100.00**			50	**100.00**
4. Written communication		**93.01**				50	**93.01**
5. Integrative and applied learning							
6. Civic knowledge and engagement				**40.00**	**100.00**		**40.00**

* only a few students in the course, results not used in the average