2018 - 2019
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.

This year OAPA has refined the annual assessment reporting process to make it simple, clear, and of high quality at the same time.

IMPORTANT REMINDER:
Please use the "Guidelines" and "Examples for Answering Open-Ended Questions" to answer each question in the template as you complete the report. Please provide and attach the following information:

1. PLO Assessed **(Q1.1, Q2.1)**
2. Definition of the PLO(s) **(Q2.1.1)**
3. Rubrics and Explicit Program (not class) Standards of Performance/Expectations **(Q2.3)**
4. Direct Measures **(Q3.3.2)**
5. Data Table(s) **(Q4.1)**
6. Curriculum Map **(Q21.1)**
7. Most Updated Assessment Plan **(Q20.2)**

Please provide only relevant information and limit all of your attachments to 30 pages.

Please save your progress. There is NO "submit" button. After July 1, 2019, the saved report will be considered the final submission.

DEADLINE TO SUBMIT: JULY 1, 2019.

Please begin by selecting your program name in the drop down.
If the program name is not listed, please enter it below:

BS Computer Science

OR enter program name:

Section 1: Report All of the Program Learning Outcomes Assessed

Question 1: All the Program Learning Outcomes Assessed

Q1.1.
Which of the following Program Learning Outcomes (PLOs) including Sac State Baccalaureate Learning Goals (BLGs)or 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**
- ☐ 20. **Research**
- ☐ 21A. Other, specify any assessed PLOs not included above:

a.

b.

c.

☐ 21B. **Check here if your program has not collected any data for any PLOs**. Please go directly to Q6 (skip Q1.3.a. to Q5.3.1.)

Q1.3.a.
Are your PLOs closely aligned with the mission and/or the strategic plan of the university?

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

Undo

(Remember: Save your progress. There is NO "submit" button. After July 1, 2019, the saved report will be considered the final submission.)

Section 2: Report One Learning Outcome in Detail

Question 2: Detailed Information 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):

Overall Disciplinary Knowledge

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

Q2.1.1.
Please provide the definition for this PLO **(See Appendix 15 Sample Answer to Q2.1.1).**

The Computing Accreditation Commission (CAC) of ABET has adopted new criteria for computing programs that go into effect for all programs in the 2019-20 accreditation cycle. In order to be in compliance with these new criteria, the department has extensively revised the assessment plan in Spring 2018. In Fall 2018, the revised assessment plan (2018 version), as well as the updated student outcomes SO (1) through SO (6) and the corresponding performance indicators, was approved and adopted starting from the 2018-2019 cycle. AY 2018-2019 was the first year in a new three-year assessment cycle.

The following are the latest student outcomes to evaluate student competencies in the discipline.

SO (1): Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.

SO (2): Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.

SO (6): Apply computer science theory and software development fundamentals to produce computing-based solutions.

For each outcomes, we defined a set of performance indicators. Each indicator is evaluated in one or more core courses. According to our latest assessment plan, only outcomes (1), (2) and (6) are evaluated in the first year of the three year assessment cycle. The year reported here (2018-2019) is the first year in a new cycle. Therefore, the results in this report will be limited to Outcomes (1), (2) and (6). The following table shows the mapping of these student outcomes to performance indicators and core course.

1	Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.	1-1. Apply modeling and analysis techniques.	CSC 131, 190/191
		1-2. Apply requirements engineering process.	CSC 131, 190/191
		1-3. Apply design principles.	CSC 131, 190/191
		1-4. Apply project management processes and tools.	CSC 131, 190/191
		1-5. Demonstrate the ability to analyze and design basic and complex hardware components.	CSC 137
2	Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.	2-1. Understand and apply proper testing techniques	CSC 131, 190/191
		2-2. Apply error detection and correction, flow control, and congestion control principles	CSC 138

Q2.2.
Has the program developed or adopted ***explicit program standards of performance/expectations*** for this PLO? (e.g. "We expect 80% 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

Undo

Q2.2.a.
Please provide the standards of performance/expectations for this PLO:

The percentage of students satisfying each performance indicator (the target success rate) was 70%.

Q2.3.
Please **provide and/or attach the rubric(s)** that you used to evaluate your assignment**(**
See Appendix 15 Sample Answer to Q2.3):

According to the new assessment plan (2018 version), in Fall 2018, instructors for upper division core courses identified questions that would be used to assess performance indicators for outcomes SO(1), SO(2), and SO(6). These questions were submitted to the department assessment committee for review prior to implementation as assignment or exam questions. At the end of Fall 2018/Spring 2019 semesters, faculty evaluators submitted the percentage of students satisfying each performance indicator (the target success percentage was 70%). The minimum score for students to satisfy each performance indicator was 70% of the maximum possible score of selected questions. If that 70% target is not met, actions are taken in the next year to improve student performance (closing the loop) . More details appear in the assessment plan.

Click here to attach a file | Click here to attach a file

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:
☐	☐	☐	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**)

Undo

Q3.1.1.
How many assessment tools/methods/measures **in total** did you use to assess this PLO?

N/A

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**)

Undo

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:

As explained in Q2.3, one or more courses were selected for evaluating each performance indicator. The instructor for each core course was responsible for evaluating the set of performance indicators mapped to his/her course. The evaluation was done using one or more exam questions or homework assignments. Student performance data for each indicator were reported by the instructors to the assessment coordinator, who analyzed the results.

(Remember: Save your progress. There is NO "submit" button. After July 1, 2019, the saved report will be considered the final submission.)

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**)

Undo

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 **attach the assignment instructions that the students received to complete the assignment (** **See Appendix 1 Sample Answer to Q3.3.2**):

As discussed in Q2.1.1, there were in total thirty-four (5+12+17) performance indicators defined for the PLO reported this year. The evaluation of each performance indicator was done using one or more exam questions or homework assignments.

All the questions and assignments that were used in the evaluation this year have been reported to the assessment coordinator. All these questions and assignments can be provided upon request.

Click here to attach a file **Click here to attach a file**

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.**)

Undo

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

Undo

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

Undo

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

Undo

Q3.5.
Please enter the number (#) of faculty members who participated in planning the assessment data **collection** of the selected PLO?

Entire faculty

Q3.5.1.
Please enter the number (#) of faculty members who participated in the **evaluation** of the assessment data for the selected PLO?

11

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

Undo

Q3.6.
How did you **select** the sample of student work (papers, projects, portfolios, etc.)?

That was selected by each instructor based on the indicators, approved by the assessment committee.

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

The work of all the students in each assessed class was included in the assessment.

Q3.6.2a.
Please enter the number (#) of students ***from ONLY your program*** that were assessed for this program learning outcome (not all students in the class).

See details in the assessment data reported

Q3.6.3a.
Please enter the number (#) of samples of student work ***from ONLY your program*** that were evaluated for this program learning outcome.

All of them

Q3.6.4.
Was the sample size of student work for this program assessment adequate for assessing this program learning outcome?

- (•) 1. Yes
- ( ) 2. No
- ( ) 3. Don't know

Undo

(Remember: Save your progress. There is NO "submit" button. After July 1, 2019, the saved report will be considered the final submission.)

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**)

Undo

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:

Click here to attach a file **Click here to attach a file**

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**)

Undo

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**)

Undo

Q3.8.3.
If other measures were used, please specify:

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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 do **NOT** include student names and other confidential information. This is going to be a **PUBLIC** document:

data and findings for OAPA (18-19).docx
25.53 KB Click here to attach a file

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 **(See Appendix 15 Sample Answers to Q4.1-Q4.3)**?

As noted in Q4.1, students performance meet our program's standards (the target success rate) for most but not all performance indicators. The following indicators did not meet the 70% minimum standard:

- (2-9) Apply semi-formal modeling languages, such as, UML, in requirement specification and design appropriately. (68%) (CSC131)
- (6-2) Explain trade-offs in the selection of algorithms and data structures. (53%) (CSC130)
- (6-5) Solve problems recursively. (57%) (CSC135)
- (6-7) Solve problems using the logic programming paradigm. (46%) (CSC135)
- (6-15) Demonstrate understanding of issues in lexical analysis. (67%) (CSC135)
- (6-16) Produce a recursive descent parser for a medium size grammar. (62%) (CSC135)

The assessment coordinator will be working with the instructors of these courses on improving student performance on the corresponding indicators and then doing a reassessment.

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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

Undo

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

Undo

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

Undo

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**)

Undo

Q5.1.1.
Please describe ***what changes*** you plan to make in your program as a result of your assessment of this PLO.

As mentioned in Q4, our students did not meet the target success rate for six performance indicators. Each performance indicator corresponds to a certain skill that the assessment coordinator and the course instructor will be working on improving. Methods of improvement include spending more lecture time and giving more excercises to improve these skills. After implementing these improvements, we will be reassessing student performance on these indicators.

Q5.1.2.
Do you have a plan to assess the ***impact of the changes*** that you anticipate making?
- 1. Yes, describe your plan:

In Fall 2019, the assessment coordinator and the course instructor will be working on improving all the performance indicators that did not meet the target rate (70%). Methods of improvement will be proposed, discussed, and implemented. After implementing these improvements, we will be reassessing student performance on these indicators in AY 2019-2020 cycle for closing the loop.

- 2. No
- 3. Don't know

Undo

Q5.2.

To what extent did you apply **previous assessment results** collected through your program in the following areas? Undo 1-12 Undo 12-23	1. Very Much	2. Quite a Bit	3. Some	4. Not at All	5. N/A
1. Improved specific courses	○	◉	○	○	○
2. Modified curriculum	○	◉	○	○	○
3. Improved advising and mentoring	○	○	◉	○	○
4. Revised learning outcomes/goals	○	◉	○	○	○
5. Revised rubrics and/or expectations	○	◉	○	○	○
6. Developed/updated 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:	○	○	○	○	○

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

The above assessment data for 2018-2019 has not been used yet. As explained above, it will be used in Fall 2019 to improve student performance on the indicators that did not meet the target. This approach was used in previous years according to the ABET accreditation standards and procedures.

Note that the Computing Accreditation Commission (CAC) of ABET has adopted new criteria for computing programs that will go into effect for all programs in the 2019-20 accreditation cycle. In order to be in compliance with these new criteria and based on the previous assessment data, the department has extensively updated the assessment plan in Spring 2018. The updated assessment plan (2018 version), as well as the revised student outcomes SO (1) through SO (6) and the corresponding performance indicators, was approved and adopted starting from the 2018-2019 cycle.

Q5.3. To what extent did you apply **previous assessment feedback** from the Office of Academic Program Assessment in the following areas? Undo 1-9	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 **previous feedback** from the Office of Academic Program Assessment in any of the areas above:

Based on the previous feedback from OAPA, in Spring 2018, we have revised the performance indicators used for evaluating PLO (g) (Write effectively) to make them more measurable, i.e., using action verbs. We have also redesigned the rubrics used for each performance indicator for PLO (g). In evaluating PLO (g), we adopted a norming precess to make sure all the faculty who participated in the evaluation would assess student work in a consistent way. 16 faculty members participated in the evaluation of PLO (g) and they are grouped into faculty-pairs. Each faculty-pair was given the rubric and five student papers to evaluate. Faculty evaluated each student paper in terms of the five performance indicators using the following 4 point scale mechanism: 4 - Exceeds criterion; 3 - Satisfies criterion; 2- Approaches criterion; 1 - Does not (or fails to) satisfy criterion. Each faculty member was tasked to work with her partner to compare and discuss their scores and then submit the agreed upon score to the program assessment coordinator.

The updated indicators for PLO (g) as well as the corresponding VALUE rubrics are as shown below.

(g) Write effectively.	g-1. Focus – clearly addresses the topics	CSC 191
	g-2. Organization – introduction includes clear purpose and overview of document; body provides supportive information; conclusion is reasonable and well-stated.	CSC 191
	g-3 Problem Statement - purpose, nature of challenges, and significance of work are clear.	CSC 191
	g-4 Word Choice – use and placement of words and phrases are appropriate and accurate for the topics addressed.	CSC 191
	g-5 Sentence and Paragraph Structure – well-constructed sentences with varied structures; correct syntax, grammar, and spelling.	CSC 191

CATEGORIES	4	3	2	1	Score	
Focus	All topics are addressed clearly and completely.	Most topics are addressed clearly and completely.	Most topics are addressed but not clearly and/or completely.	Not all topics are addressed.		
Organization	The introduction states the purpose for writing and an overview of the content of writing. The body provides supportive information that is relevant and presented in a logical order. The conclusion is	The introduction includes an overview of writing but not a clear description of the purpose of writing. The body provides supportive information that is limited but relevant to the topics and is presented in a logical order.	The introduction does not provide a complete overview of writing and the description of the purpose of writing is not clear. The body provides a limited amount of supportive information that is	There is no clear introduction, structure, or conclusion.		

(Remember: Save your progress. There is NO "submit" button. After July 1, 2019, the saved report will be considered the final submission.)

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:

NA

Click here to attach a file | Click here to attach a file

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:

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. **Research**
- ☐ 21. 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?

The recommendations from the last program review were addressed in the following ways this year:

(1) Standards of performance were clarified for all the assessment data. The minimum percentage of students that satisfies each performance indicator (the target success rate) was 70%. The minimum score for students to satisfy each performance indicator was 70% of the maximum possible score of selected assessment questions. If that 70% target is not met, actions are taken in the next year to improve student performance (closing the loop). If any assessed performance indicator uses a VALUE rubric, the following 4-point scale on selected assessment questions was used: 4: exceeds criterion, 3: meets criterion, 2: progressing to criterion, and 1: below expectations.

(2) The impact of the changes to new ABET criteria was assessed. In order to be in compliance with these new criteria and based on the previous assessment data, the department has extensively updated the assessment plan in Spring 2018 . The updated assessment plan (2018 version), as well as the revised student outcomes SO (1) through SO (6) and the corresponding performance indicators, was approved and adopted starting from the 2018-2019 cycle. AY 2018-2019 was the first year in a new three-year assessment cycle.

Q9. Please attach any additional files here:

Click here to attach a file | Click here to attach a file

Click here to attach a file | Click here to attach a file

Q9.1.
If you have attached **any** files to this form, please list **every** attached file here:

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]

BS Computer Science

Q11.
Report Author(s):
Haiquan Chen

Q11.1.
Department Chair/Program Director:
Nikrouz Faroughi

Q11.2.
Assessment Coordinator:
Haiquan Chen

Q12.
Department/Division/Program of Academic Unit (select):
Computer Science

Q13.
College:
College of Engineering and Computer Science

Q14.
What is the total enrollment (#) for Academic Unit during assessment (see Departmental Fact Book):
1,161 (Fall 2016)

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:

Undo

Q16. Number of **undergraduate degree programs** the academic unit has?
2

Q16.1. List all the names:
BS in computer science (submitted here)

BS in computer engineering, joint program with electrical engineering (to be submitted separately)

Only CS is submitted here. CE to be submitted separately.

Q16.2. How many concentrations appear on the diploma for this undergraduate program?
0

Q17. Number of **master's degree programs** the academic unit has?
3

Q17.1. List all the names:

Computer Science

Software Engineering

Computer Engineering, joint program with electrical engineering

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

0

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

0

Q18.1. List all the names:

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

0

Q19.1. List all the names:

When was your **Assessment Plan**...	1. Before 2012-13	2. 2013-14	3. 2014-15	4. 2015-16	5. 2016-17	6. 2017-18	7. No Plan	8. Don't know
Undo								
Q20. Developed?	◉	○	○	○	○	○	○	○
Q20.1. Last updated?	○	○	○	○	○	◉	○	○

Q20.2. (Required)
Please **obtain** and **attach** your latest **assessment plan**:

CS_BS_Assessment_Plan_new_09-10-2018_final.docx
28.05 KB

Q21.
Has your program developed a **curriculum map? Please note: A curriculum map is not a roadmap. A roadmap is a graphical representation of the courses students must take to graduate. A curriculum map is the matrix that represents in which course a certain program learning outcome (PLO), student learning outcome (SLO), or course learning outcome (CLO) was introduced, developed, and/or mastered.**

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

Undo

Q21.1.
Please **obtain** and **attach** your latest **curriculum map**:

CS_BS_Curriculum_Map.docx
16.3 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

Undo

Q23.
Does your program have a capstone class?
- (•) 1. Yes, specify:

CSC 190/191

- ( ) 2. No
- ( ) 3. Don't know

Undo

Q23.1.
Does your program have a capstone project(s)?
- (•) 1. Yes
- ( ) 2. No
- ( ) 3. Don't know

Undo

Q24.
BEFORE YOU SUBMIT: Please **check** that you have included all of the following key evidences:
- ☑ 1. PLO Assessed **(Q1.1, Q2.1)**
- ☑ 2. Definition of the PLO(s) **(Q2.1.1)**
- ☑ 3. Rubrics and Explicit Program (not class) Standards of Performance/Expectations **(Q2.3)**
- ☑ 4. Direct Measures **(Q3.3.2)**
- ☑ 5. Data Table(s) **(Q4.1)**
- ☑ 6. Curriculum Map **(Q21.1)**
- ☑ 7. The Most Updated Assessment Plan **(Q20.2)**

Please do **NOT** include student names and other confidential information. This is going to be a **PUBLIC** document.

Save When Completed!
(**Remember**: **Save your progress. There is NO "submit" button. After July 1, 2019, the saved report will be considered the final submission.**)

DEADLINE: July 1, 2019.

Thank you and have a great summer!

ver. 03.**11**.19

Assessment of Outcome (1) *Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.*

- ***Results of 2018-2019 Assessment***

Five performance indicators for outcome (1) were assessed. Results indicate that SO (a) was satisfied at 82%. All the five indicators satisfied the criterion.

The assessment results for SO (1) are provided in Table 1.

Table 1. Assessment Results for SO (1)

Performance Indicators n = number of students		**CSC Core Course**	**2018-2019 % Satisfying Criterion**
1-1	Apply modeling and analysis techniques.	131	88% (n=59)
1-2	Apply requirements engineering process.	131	75% (n=59)
1-3	Apply design principles.	131	71% (n=59)
1-4	Apply project management processes and tools.	131	86% (n=59)
1-5	Demonstrate the ability to analyze and design basic and complex hardware components.	137	89% (n=27)
Average Percentage			**82%**

Assessment of Outcome (2) *Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.*

- ***Results of 2018-2019 Assessment***

The assessment results for SO (2) are provided in Table 2.

Table 2. Assessment Results for SO (2)

Performance Indicators n = number of students		**CSC Core Course**	**2018-2019 % Satisfying Criterion**
2-1	Understand and apply proper testing techniques	131	95% (n=59)
2-2	Apply error detection and correction, flow control, and congestion control principles.	138	87% (n=31)
2-3	Apply synchronization mechanisms to the critical section problem and to the process coordination.	139	90% (n=31)
2-4	Use software metrics appropriately.	131	86% (n=59)
2-5	Use object-oriented design appropriately.	131	75% (n=59)
2-6	Use design patterns appropriately	133	70% (n=30)
2-7	Use verification and validation techniques appropriately.	131	95% (n=59)
2-8	Apply documentation standards appropriately.	131	
2-9	Apply semi-formal modeling languages, such as, UML, in requirement specification and design appropriately.	131	**68% (n=59)**
2-10	Demonstrate the ability to develop communication protocols and networking applications.	138	88% (n=33)

2-11	Implement event-driven GUI applications.	133	86% (n=30)
2-12	Demonstrate competence in using SQL	134	81% (n=32)
Average Percentage			**84%**

Eleven performance indicators for outcome (2) were assessed. Results indicate that SO (2) was satisfied at 84%. The following indicator did not meet the 70% minimum standard:

- (2-9) Apply semi-formal modeling languages, such as, UML, in requirement specification and design appropriately. (68%) (CSC131)

- ***Recommendation***

In Fall 2019, the assessment coordinator will be working with the instructors of these courses on improving student performance on the corresponding topics/skills and then doing a reassessment.

Assessment of Outcome (6) *Apply computer science theory and software development fundamentals to produce computing-based solutions.*

- ***Results of 2018-2019 Assessment***

The assessment results for SO(6) are provided in Table 3

Table 3. Assessment Results for SO(6)

Performance Indicators n = number of students		**CSC Core Course**	**2018-2019 % Satisfying Criterion**
6-1	Apply appropriate fundamental algorithms and essential data structures in software development.	130	75% (n=45)
6-2	Explain trade-offs in the selection of algorithms and data structures.	130	**53% (n=45)**
6-3	Apply appropriate mathematical transformations and algorithms for 2D graphics.	133	77% (n=30)
6-4	Apply the relational data model in developing database systems.	134	81% (n=32)
6-5	Solve problems recursively.	135	**57% (n=37)**
6-6	Construct abstract machines and grammars for a given language.	135	92% (n=37)
6-7	Solve problems using the logic programming paradigm.	135	**46% (n=37)**
6-8	Solve problems using the functional programming paradigm	135	73% (37)
6-9	Calculate performance parameters, such as, circuit propagation delay, memory latency, speedup, etc.	137	71% (n=27)
6-10	Demonstrate knowledge of network architecture, layered model, and protocol stacks.	138	90% (n=31)

6-11	Demonstrate working knowledge of network management including monitoring, measurement, analysis, and control.	138	88% (n=33)
6-12	Use principles of concurrency and tradeoffs in synchronization approaches, analysis, and control appropriately.	139	74% (n=31)
6-13	Describe and apply deadlocks solutions appropriately.	139	
6-14	Apply principles of resource management appropriately.	139	
6-15	Demonstrate understanding of issues in lexical analysis	135	**67% (n=37)**
6-16	Produces a recursive descent parser for a medium size grammar	135	**62% (n=37)**
6-17	Demonstrate the ability to use hardware design simulation tools.	137	85% (n=27)
Average Percentage			**73%**

Fifteen performance indicators for outcome (6) were assessed. Results indicate that SO(6) was satisfied at 73%. The following five indicators did not meet the 70% minimum standard:

- (6-2) Explain trade-offs in the selection of algorithms and data structures. (53%) (CSC130)
- (6-5) Solve problems recursively. (57%) (CSC135)
- (6-7) Solve problems using the logic programming paradigm. (46%) (CSC135)
- (6-15) Demonstrate understanding of issues in lexical analysis. (67%) (CSC135)
- (6-16) Produce a recursive descent parser for a medium size grammar. (62%) (CSC135)

- ***Recommendation***

In Fall 2019, the assessment coordinator will be working with the instructors of these courses on improving student performance on the corresponding topics/skills and then doing a reassessment.

B.S. in Computer Science

Correspondence between Upper Division Required Courses and Student Outcomes

Outcomes / Courses	1	2	3-a	3-b	4	5	6
CSC 130		X					**X**
CSC 131	**X***	**X**	X	X	X	X	X
CSC 133	X	**X**					**X**
CSC 134		**X**					**X**
CSC 135	X	X					**X**
CSC 137	**X**						**X**
CSC 138		**X**			**X**		**X**
CSC 139		**X**			X		**X**
CSC 190/191	**X**	**X**	**X**	**X**	**X**	**X**	X
CSC 192 & CSC 194				X	X		
CSC 195 & CSC 195A	X	X	X	X	X	X	X
CSC 198 & CSC 199	X	X			X		X
PHIL 103					**X**		

***** Bolded courses are those where assessment for the outcome is conducted

Courses Contributing to CpE Student Learning Outcomes

																									All
ABET Learning Outcome	Engr 1	CSc 15	CSc 20	CSc 28	CSc 35	CpE 64	CSc 60	CSc 28	Eng 17	CpE 166	CpE 185	CSc 130	EEE 117	EEE 117L	CpE 142	EEE 108	EEE 108L	EEE 180	CpE 186	CpE 151	CSc 139	Engr 120	CpE 190	CpE 191	Overall
a	-	D	D	D	D	D	D	D	D	I	D	D	D	D	D	D	-	D/M	D	D	M			M	M
b	-	-	I	-	D	I	I	-	-	I/D	-	I	-	M	M	D	-	D/M	-	D	D			M	M
c	-	-	-	I	-	-	-	-	I	-	-	-	D	-	D	D	-	D	-	D	D			M	M
d	-	-	I	-	-	I	-	-	-	-	-	-	-	D	-	-	-	I	M	-	-			I/M	M
e	-	-	I	I	I	I	D	D	I	I/D	I	D	D	D	D	D	-	D	D	M	M			M	M
f	I	-	-	I	D	I	-	-	-	-	-	-	-	I	-	-	M	I	-	D	D			D	M
g	I	-	I	I	D	I	I	-	-	-	-	-	-	D	D	-	D	D/M	I	D	D			M	M
h	I	-	-	-	I	D	-	-	-	I	-	-	D	I	-	D	D	D	I	D	D			M	M
i	-	-	-	I	I	I	I	-	I	-	-	-	I	D	D	D	I	I	D	-	I			D	D
j	I	-	I	I	I	D	I	-	-	I	-	-	D	I	-	-	D	D	M	D	D			M	M
k	I	I	I	I	D	D	D	D	I	I	-	D	D	D	M	M	-	D/M	D	M	M			M	M

I = Introduced, D = Developed and Practiced with feedback, M = Demonstrated as Mastery level appropriate for graduation