

California State University, Fresno

College of Science and Mathematics

Department of Computer Science

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Student Outcomes Assessment Plan (SOAP)

I. Mission Statement

The mission of the Department of Computer Science is to provide undergraduate and graduate programs giving students an inclusive learning environment where students from all backgrounds can obtain a modern and comprehensive computer science education required for life and work in our technologically advanced and diverse society, as well as critical thinking and technical skills that will be needed in the students' later careers, whether professional or academic; to support the university mission by offering valuable service and General Education courses that bring the ideas and methodology of computer science to non-majors and teaching internship and service-learning courses to engage with local businesses and non-profits.

II. Institutional Learning Outcomes, Program Learning Outcomes/Goals, and SLO's [a,b,c]

- A. Institutional Learning Outcomes. Fresno State ILO's are posted on the following webpage:
<http://fresnostate.edu/academics/oie/assessment/fresno-state-assessment.html>
- B. The program learning outcomes for students of the Department of Computer Science are:
 - 1. Knowledge, to understand the concept of computation in both its abstract form and its physical realizations (PLO 1). Specifically, students will be able to:
 - a. Demonstrate solid understanding of fundamental concepts and principles in each specific area of computer science and how they are applied in various scenarios and applications (SLO 1);
 - b. Demonstrate solid skill of problem solving by applying appropriate data organization, programming methods, algorithms, and communications (SLO2);
 - 2. Skills, to be able to implement computational models in software effectively (PLO 2). Specifically, students will be able to:
 - a. Gather and analyze software requirements, apply appropriate design, implement software using one or more modern programming languages, and test the correctness of the software (SLO 3);
 - b. Work as a team to solve larger scale problems and use contemporary tools to speed up the development process (SLO 4);

- c. Present technical findings effectively, write satisfactory reports, document their work, and communicate their ideas with both Computer Science professionals and general audience (SLO 5); and
 3. Values, to be able to understand professional, ethical, legal, security, and social issues and be responsible as a computer science professional in the contemporary world. Specifically, students will be able to:
 - a. Attain an understanding of these issues and responsibilities by graduation (PLO 3 and SLO 6)
 4. [JDEI] Students from all backgrounds will meet *the above* program learning outcomes (i.e., PLO 1, PLO 2 and PLO 3).
 - a. A breakdown of rubric scores from one or more of the above SLOs will not show a moderate or lower effect size for categories of gender, ethnicity, first-gen status, Pell eligibility, veteran status, and enrollment status (PLO 4).
- C. A few years after graduation, graduates should accomplish the following Program Educational Objectives (PEOs):
 1. Pursue a successful and professional career and contribute to the field of computer science or related ones.
 2. Equip with soft skills for effective communications and team-based collaborations.
 3. Engage in lifelong learning opportunities for professional growth.
 4. Understand and adhere to ethical principles and professional responsibilities.
 5. Seek to serve the community as a responsible professional or leader.

III. Curriculum Map [d]: Courses in which SLO's are addressed and evaluated

The following table shows the evaluation map between PLOs/SLOs and courses. Note that PLO 4 is evaluated along with PLO 1 to PLO 3 and hence can be evaluated in any course listed in the table.

Course	SLO 1 in PLO 1	SLO 2 in PLO 1	SLO 3 in PLO 2	SLO 4 in PLO 2	SLO 5 in PLO 2	SLO 6 in PLO 3
CSCI 1	I				I	I
CSCI 40	I	I				
CSCI 41	I	I				
CSCI 60	I					
CSCI 80	I					
CSCI 100	I					
CSCI 113	I					
CSCI 114	I	D				
CSCI 115	D	D				
CSCI 117	I					
CSCI 119	I					

CSCI 126	I					
CSCI 130	I	D		I	I	
CSCI 150	I	D	I	I	I	D
CSCI 152E	D	D	D	D	I	D
CSCI 154	I			D	D	
CSCI 156	D			D	D	
CSCI 157	D					D
CSCI 158		D		D	D	
CSCI 159		D				
CSCI 164	I					D
CSCI 165	D			D	D	
CSCI 166	D	D				
CSCI 167	D	D			D	
CSCI 168E	I					
CSCI 172	I					
CSCI 173	D			D	D	
CSCI 174	D	D				
CSCI 175	D	D				
CSCI 176	I					
CSCI 178	I			D	D	
CSCI 179	I			D	D	
CSCI 191T	I				D	
CSCI 195i	M	M			M	
CSCI 196S	M	M			M	
CSCI 198	M	M			M	

For courses in the major, using the abbreviations below, indicate which outcomes are introduced, which are developed, and which are mastered in that particular course.

I = Introduced

D = Developed

M=Mastered

IV. SLO's Mapped to Assessment Measures and Methods [e]

Assessment Measure	Evaluation Method	SLO 1 in PLO 1	SLO 2 in PLO 1	SLO 3 in PLO 2	SLO 4 in PLO 2	SLO 5 in PLO 2	SLO 6 in PLO 3	PEOs
Embedded Questions	Score (percentage)	x	x				x	
Programming Projects	Criteria	x	x	x	x	x		
Presentations	Criteria	x	x	x	x	x	x	
Reports	Criteria	x	x	x	x	x		
Survey	Criteria	x	x	x	x	x		x

V. Assessment Measures: Description of Assignment and Method (rubric, criteria, etc.) used to evaluate the assignment [f]

A. Direct Measures (Department/Program must use a minimum of three different direct measures)

1. Embedded Questions

Designated Computer Science courses will utilize rubrics to assess student projects produced in those courses. Such rubrics may describe, for example, the assessment of requirements, specifications, design, implementation, testing, tools/environments, life-cycle, team organization and communication, and the software project management plan of a software engineering project.

Criteria: It's considered acceptable that at least 70% of the evaluated projects receive 70% score/percentage. For JDEI, A breakdown of rubric scores from the above SLOs will not show a moderate or lower effect size for categories of gender, ethnicity, first-gen status, Pell eligibility, veteran status, and enrollment status.

2. Student Programming Projects

Designated Computer Science courses will utilize rubrics to assess student projects produced in those courses. Such rubrics may describe, for example, the assessment of requirements, specifications, design, implementation, testing, tools/environments, life-cycle, team organization and communication, and the software project management plan of a software engineering project.

See the appendix for an example programming assessment rubric.

Criteria: A score of 0-5 is given for each item in the rubric. It's considered acceptable that at least 70% of the evaluated projects receive an average score of 3.5. For JDEI, A breakdown of rubric scores from the above SLOs will not show a moderate or lower effect size for categories of gender, ethnicity, first-gen status, Pell eligibility, veteran status, and enrollment status.

3. Student Course Presentations

Designated Computer Science courses will utilize rubrics to assess student presentations produced in those courses. Such rubrics may describe, for example, the assessment of structure of organization, effectiveness of delivery, and appropriateness of technical contents.

Criteria: A score of 0-5 is given for each item in the rubric. It's considered acceptable that at least 70% of the evaluated projects receive an average score of 3.5. For JDEI, A breakdown of rubric scores from the above SLOs will not show a moderate or lower effect size for categories of gender, ethnicity, first-gen status, Pell eligibility, veteran status, and enrollment status.

4. Capstone Student Project Reports

Capstone student project reports provide a strong indicator for the student learning outcomes listed in Section II. Such reports describe what problems they solve and how students apply computer science knowledge into their internship, service-learning project or senior project experience. Capstone project advisor will assess student reports using the rubrics provided by the department (see appendix)

Criteria: A score of 0-5 is given for each item in the rubric. It's considered acceptable that at least 70% of the evaluated projects receive an average score of 3.5. For JDEI, A breakdown of rubric scores from the above SLOs will not show a moderate or lower effect size for categories of gender, ethnicity, first-gen status, Pell eligibility, veteran status, and enrollment status.

B. Indirect Measures (Department/Program must use a minimum of one indirect measure)

1. Senior Exit Survey

The department/program assessment/equity/curriculum committee will develop an exit survey for graduating seniors (related to at least one SLO each academic year). The survey participants will be anonymous and students will have the option to disclose demographic data.

Criteria: A score of 0-5 is given for each item in the rubric. It's considered acceptable that at least 70% of the surveys receive an average score of 3.5 (out of 5). For JDEI, A breakdown of rubric scores from the above SLOs will not show a moderate or lower effect size for categories of gender, ethnicity, first-gen status, Pell eligibility, veteran status, and enrollment status.

2. Alumni Survey

The department/program assessment/equity/curriculum committee will develop an alumni survey for graduates (related to PEO). The survey participants will be anonymous and graduates will have the option to disclose demographic data.

Criteria: A score of 0-5 is given for each item in the rubric. It's considered acceptable that at least 70% of the alumni surveys receive an average score of 3.5 (out of 5). For JDEI, A breakdown of rubric scores from the above SLOs will not show a moderate or lower effect size for categories of gender, ethnicity, first-gen status, Pell eligibility, veteran status, and enrollment status.

VI. Assessment Schedule/Timeline [g]

Academic Year	Measure	SLO1	SLO2	SLO3	SLO4	SLO 5	SLO 6	PEO		
2025-2026	A1 Questions	x	x				x			
2026-2027	B1 Survey	x	x	x	x	x		x		

Academic Year	Measure	SLO1	SLO2	SLO3	SLO4	SLO 5	SLO 6	PEO
2028-2029	A2 Programming	x	X	x	x	x		
2029-2030	A3 Presentations	x	x	x	x	x		
2030-2031	A1 Questions	x	x				x	
2031-2032	A4 Reports	x	x	x	x	x		
2032-2033	B1 Survey	x	x	x	x	X		x
2033-2034	A1 Questions	x	x				x	

VII. Closing the Loop [h,j,k]

The Department of Computer Science has a curriculum and assessment committee consisting of all tenured and tenure track faculty monitoring the undergraduate program, suggesting curriculum and other catalog changes, and reviewing changes proposed by others. The Chair of this committee is also the Curriculum/Assessment Coordinator.

The members of the Undergraduate Committee are responsible for designing and carrying out assessment activities with the help of the entire faculty as needed. The Committee also analyzes the resulting data and suggests changes to the program as necessary. Assessment data and suggested program changes are presented to the entire faculty in the annual department assessment retreat (or department meetings), and the entire faculty decides whether to implement any changes.

Fresno State Closing the Loop process is described immediately below.

VIII. A major assessment report, which focuses on assessment activities carried out the previous academic year, is submitted in September of each academic year and evaluated by the Learning Assessment Team and Director of Assessment at Fresno State.

The assessment coordinator will submit an annual assessment report every September. Feedback will be shared in department meetings.