

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 programs giving students a broad range of knowledge and experience in computer science, as well as a depth of education that will be needed in the students' later careers, whether professional or academic. The Master of Science degree program in Computer Science offers advanced principles, applications, and current topics.

The general learning goals for students of the Department of Computer Science are *knowledge*, to understand the concept of computation in both its abstract form and its physical realizations; *skills*, to be able to implement and design computational models in software effectively; and *values*, to appreciate the roles and responsibilities of computer science professionals in the global world.

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 apply knowledge of theoretical foundations, formalisms, and computer architecture. (PLO 1). Specifically, students will be able to:
 - a. Analyze the effects of choice of algorithm and data structure on correctness and performance (SLO 1);
 - b. Apply formalisms to model software solutions (SLO 2); and
 - c. Evaluate computer architectures, models, and organizations and their relationship to software (SLO 3).
 - 2. Skills, to analyze a problem, and then synthesize, implement, and evaluate a computer-based system, process, component, or program to meet requirements. (PLO 2). Specifically, students will be able to:

- a. Analyze, design, implement, debug, verify, and/ validate software to meet specified requirements (SLO 4); and
 - b. Work independently and collaboratively to research a problem, formulate and implement solutions (SLO 5).
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] All students 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).

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

Course	SLO 1	SLO 2	SLO 3	SLO 4	SLO 5	SLO 6
CSCI 174	I					
CSCI 188		I				
CSCI 200					I	I
CSCI 201					I	I
CSCI 202					I	I
CSCI 213			D			
CSCI 217		D				
CSCI 226	D			D		
CSCI 230	D			D		
CSCI 244			D		D	
CSCI 246			D			
CSCI 250			D		D	
CSCI 252			D		D	
CSCI 253					D	

CSCI 256				D	D	
CSCI 264				D	D	
CSCI 265	D			D	D	
CSCI 272	D			D	D	
CSCI 274	D			D		
CSCI 282		D				
CSCI 284		D				
CSCI 297	M	M	M			
CSCI 298	M			M	M	
CSCI 299	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	SLO 2	SLO 3	SLO 4	SLO 5	SLO 6
Embedded Questions	Score (percentage)	x	x	x	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	

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 master's project or master's thesis 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. Exit Survey

The department/program assessment/equity/curriculum committee will develop an exit survey for graduating students (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.

VI. Assessment Schedule/Timeline [g]

Academic Year	Measure	SLO1	SLO2	SLO3	SLO4	SLO 5	SLO 6
2025-2026	A1 Questions	x	x	x	x	x	x
2026-2027	B1 Survey	x	x	x	x	X	
2028-2029	A2 Programming	x	X	x	x	x	
2029-2030	A3 Presentations	x	x	x	x	X	x
2030-2031	A1 Questions	x	X	x	x	x	x
2031-2032	A4 Reports	x	x	x	x	x	
2032-2033	B1 Survey	x	x	x	x	X	
2033-2034	A1 Questions	x	x	x	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, or formed otherwise, monitoring the graduate 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 Graduate 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.