2012-2013 Annual Program Assessment Report

College: **CECS**

Department: **ECE**

Program: **Computer Engineering**

Assessment liaison: **Deborah van Alphen**

1. **Overview of Annual Assessment Project(s). Provide a brief overview of this year's assessment plan and process. (See the chart at the end of this report for an overview of our 3-year assessment cycle.)**
   Fall '12 was the second semester of our 2-semester Major Assessment Phase, during which we collect our assessment data for our two program educational objectives (PEO's) and our 14 student learning outcomes (SLO's). PEO's were mostly assessed with survey questions, and SLO's were mostly assessed with embedded test questions, homework, and projects.
   Spring '13 was our 1-semester Major Evaluation Phase, during which we analyze and evaluate our results, and develop a Program Improvement Plan that will be implemented over the subsequent 3 semesters. The tentative Program Improvement Plan was amended and approved (as amended) by our faculty during the April Department Meeting. It was later further amended and approved by an email vote of the faculty.
2. **Assessment Buy-In. Describe how your chair and faculty were involved in assessment related activities. Did department meetings include discussion of student learning assessment in a manner that included the department faculty as a whole?**
   In the Fall '12 semester, faculty were asked to assess several SLO's (typically 3 for each required course, and 1 for each elective course) for any courses that had not already been assessed in the Spring '12 semester. The chair, the assessment coordinator, and two junior faculty served on the Program Improvement Committee, which selected the outcomes to be assessed for each course. In the Spring '13 semester, the Program Improvement Committee developed the Program Improvement Plan, based on the assessment results that were obtained. Each faculty member was also requested to take the lead responsibility for one of the SLO's. The assessment process and/or results were discussed in most of our monthly department meetings.

3. Student Learning Outcome Assessment Project. Answer items a-f for each SLO assessed this year. If you assessed an additional SLO, copy and paste items a-f below, BEFORE you answer them here, to provide additional reporting space.

3a. Which Student Learning Outcome was measured this year?

All 14 of our SLO's were assessed in the Spring '12 and Fall '12 semester. Specifically the SLO's are:

a. An ability to apply knowledge of math, science, and engineering to the analysis of computer engineering problems.
b. An ability to design and conduct scientific and engineering experiments, as well as to analyze and interpret data.
c. An ability to design systems which include hardware and/or software components within realistic constraints such as cost, manufacturability, safety and environmental concerns.
d. An ability to function in multidisciplinary teams.
e. An ability to identify, formulate, and solve computer engineering problems.
f. An understanding of ethical and professional responsibility.
g. An ability to communicate effectively through written reports and oral presentations.
h. An understanding of the impact of engineering in a social context.
i. A recognition of the need for and an ability to engage in life-long learning.
j. A broad education and knowledge of contemporary issues.
k. An ability to use modern engineering techniques for analysis and design.
l. Knowledge of probability and statistics.
m. An ability to analyze and design complex devices and/or systems containing hardware and/or software components.
n. Knowledge of math including differential equations, linear algebra, complex variables and discrete math.

3b. Does this learning outcome align with one or more of the university's Big 5 Competencies?

The SLO's above align with the Fundamental Competencies as follows:

- Critical Thinking a, c, e
- Oral Communication g
- Written Communication g
- Quantitative Literacy b, n
- Information Literacy i

3c. Does this learning outcome align with University's commitment to supporting diversity through the cultivation and exchange of a wide variety of ideas and points of view? In what ways did the assessed SLO incorporate diverse perspectives related to race,

ethnic/cultural identity/cultural orientations, religion, sexual orientation, gender/gender identity, disability, socio-economic status, veteran status, national origin, age, language, and employment rank?
No.

3d. What direct and/or indirect instrument(s) were used to measure this SLO?
SLO d was assessed by faculty observation of teamwork (including the successful implementation of a team project), in Senior Design. While the college has a rubric for teamwork, the rubric was not used.
SLO g was assessed by the evaluation of:

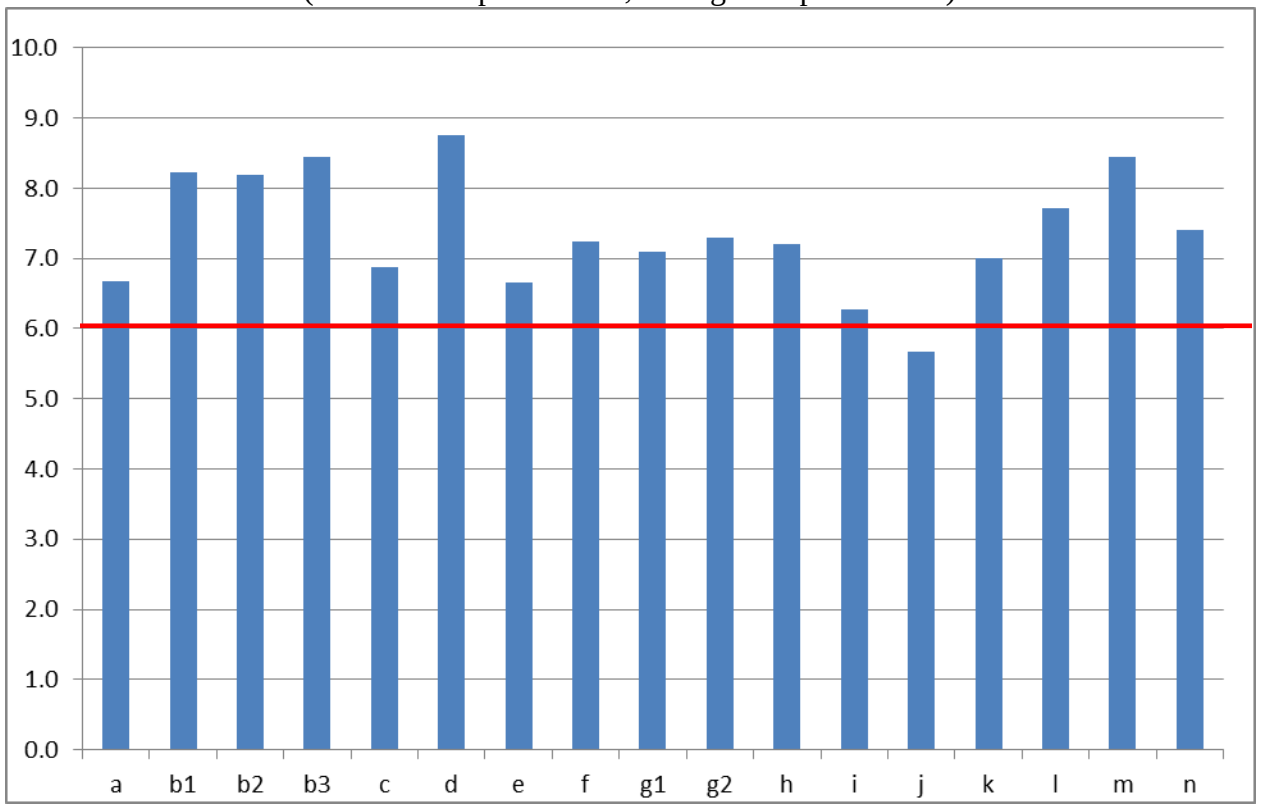
- oral reports presented in Senior Design, which were assessed using the IEEE Contest Rubric;
- written reports submitted as lab reports in various lab courses, which were assessed by the instructors without rubrics;
- written lab reports for one lab, which were assessed by the Program Improvement Committee using the department's approved rubric.

SLO's a - c, e - f, and h – n were assessed based on embedded test questions, homework assignments, and projects. Each test question, homework assignment, and project is given a score between 0 and 10, and the average of the scores obtained for each SLO is reported.

3e. Describe the assessment design methodology: For example, was this SLO assessed longitudinally (same students at different points) or was a cross-sectional comparison used (Comparing freshmen with seniors)? If so, describe the assessment points used.
None of our SLO's are assessed longitudinally.

3f. Assessment Results & Analysis of this SLO: Provide a summary of how the results were analyzed and highlight findings from the collected evidence.
For each SLO, multiple average scores were collected, typically from several classes. The scores were usually based on embedded test questions and/or projects and homework assignments. A weighted average was computed for each SLO, with the scores normalized to a maximum of 10 and with the weights proportional to the number of students assessed in each course. We consider the SLO to be met if the average score exceeds 6. The results for the 14 SLO's are given in the graph below:

CompE Program – Student Outcomes Assessment, Cycle II (2012)
(smallest sample size: 16; average sample size: 29)



The threshold level of 6 was exceeded for all SLO's except SLO j (broad education and knowledge of contemporary issues.). A few SLO's (f, h, and i) were identified as meriting action in our Program Improvement Plan, even though the threshold was met. SLO f was identified because one of the component scores (obtained from an ethics quiz) going into the average was extremely low; SLO's h and i were identified because the sample size was considered too small.

3g. Use of Assessment Results of this SLO: Describe how assessment results were used to improve student learning. Were assessment results from previous years or from this year used to make program changes in this reporting year? (Possible changes include: changes to course content/topics covered, changes to course sequence, additions/deletions of courses in program,

changes in pedagogy, changes to student advisement, changes to student support services, revisions to program SLOs, new or revised assessment instruments, other academic programmatic changes, and changes to the assessment plan.)
Our current Program Improvement Plan was just approved at the end of the Spring '13 semester, so it has not yet been implemented. Our most recent previous Program Improvement Plan (from Spring '10) was implemented during Fall '10, Spring '11 and Fall '11, so these changes have been discussed in previous assessment reports to the college.

4. Assessment of Previous Changes: Present documentation that demonstrates how the previous changes in the program resulted in improved student learning.
We have just recently started assessing the results of previous changes, so we don't have much to report here. In previous Senior Exit Surveys, our graduating seniors had requested that the ECE Department teach its own course in Differential Equations, rather than having the Math Department teach this course. We introduced a new course (ECE 280), and asked the students in the 2012 Senior Exit Survey whether the new course met their needs. The results were very positive.

5. Changes to SLOs? Please attach an updated course alignment matrix if any changes were made. (Refer to the Curriculum Alignment Matrix Template, http://www.csun.edu/assessment/forms_guides.html.)
No changes were made to the SLO's this year.

6. Assessment Plan: Evaluate the effectiveness of your 5 year assessment plan. How well did it inform and guide your assessment work this academic year? What process is used to develop/update the 5 year assessment plan? Please attach an updated 5 year assessment plan for 2013-2018. (Refer to Five Year Planning Template, plan B or C, http://www.csun.edu/assessment/forms_guides.html.)
The 5-year plan is not very useful to us. We have a well-oiled assessment process in place, which involves a 3-year cycle and is largely driven by our accreditation agency, ABET. The numbers "3" and "5" are relatively prime – hence the 5-year plan is not a good fit for us. We modified the form accordingly, to make it a better fit for our assessment plan.
See attachment for the revised plan.

7. Has someone in your program completed, submitted or published a manuscript which uses or describes assessment activities in your program? Please provide citation or discuss.
No.

8. **Other information, assessment or reflective activities or processes not captured above.**

Our assessment process (shown below) consists of a three-year cycle, with three phases: the Major Assessment Phase (lasting for one year), in which we collect data from exams, surveys, etc., the Major Evaluation Phase (lasting for one semester), in which we evaluate the assessment data and write a Program Improvement Plan, and the Implementation Phase (lasting for three semesters), in which we implement the Program Improvement Plan. In the spring and summer of 2013, we completed a Self-Study Report for ABET accreditation, which covers two cycles (hence, 6 years) of our assessment process. For interested readers, the Self-Study Report is available from either the chair or the dean.