



2008-2009 Assessment Plan Report

PROGRAM ASSESSMENT REPORT AY 2008-2009

Report Date: June 29, 2009

School/College: College of Arts and Sciences

Department/Program: Bachelor of Science in Computer Science

Person completing the Report: Gregory D. Benson

1. **Overview Statement:** Briefly summarize the assessment activities that were undertaken this academic year, indicating:
 - a. which program learning outcomes were assessed this year.
 - b. who in your department/program was involved in the assessment of the above learning outcomes

Here is our learning outcomes statement from our program description and our original assessment plan. Students who complete the Bachelor of Science in Computer Science (BSCS) will be able to demonstrate:

1. An understanding of fundamental topics in computer science including programming, data structures, algorithms, and computer systems implementation;
2. The ability to design, implement, and debug software applications;
3. Effective communication and team participation skills with respect to software development.

This year we assessed student performance in the areas specified in the first learning outcome. This involved categorizing our major courses in to *clusters*. We look at overall grade data in each of these clusters. In the following years we will expand our assessment to cover the second and third learning outcomes listed above.

Greg Benson carried out all of the assessment activities for the 2008-2009 year. However, other CS faculty were consulted regarding the approach and initial goals.



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2. Please Answer the Following Questions for Each of the Student Outcomes Assessed:

a. What did you do?

Describe clearly and concisely how you assessed the learning outcomes that were evaluated this year (e.g., measures, research methods, etc.). [please use bullet points to answer this question]

- Based on our original assessment plan we categorized our BSCS major courses into four clusters:
 1. Foundational (CS 110, CS 112, CS 245)
 2. Math & Theory (Math 109, Math 201, Math 202, CS 245)
 3. Software Development (CS 220, CS 342, CS 414, CS 490)
 4. Systems (CS 210, CS 220, CS 315, CS 326)

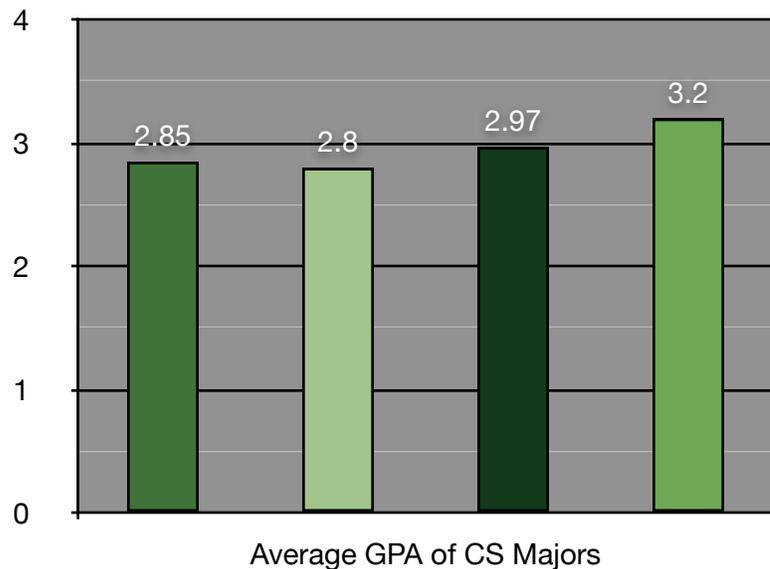
Note that CS 220 and CS 245 are included in more than one cluster. This represents the fact that these courses contain material that pertains to multiple clusters. Currently our analysis is fairly rough and is intended to give us a view into how students are doing in each of our learning outcome areas. Based on this initial assessment, we will refine our data analysis techniques.

- We collected and extracted student GPA data for BSCS majors taking these courses in Fall 2008 and Sprint 2009. Using this data we computed an average GPA for each cluster.
- Currently we are looking at clusters across all CS majors for the 2008-2009 academic year. The long term goal is to conduct this analysis on a cohort basis so that we can track student performance as they progress through the major.
- See the following page for a the result of our analysis for the 2008-2009 academic year.



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	Foundational	Math & Theory	Software Development	Systems
Average GPA	2.85	2.80	2.97	3.20
Std Dev GPA	0.36	1.22	0.88	1.08
N	22	31	34	26



b. What did the faculty in the department or program learn?

Summarize your findings and conclusions as a result of the assessment indicating strengths and weaknesses in student learning demonstrated by this assessment.

The cluster analysis has proved to be quite interesting. The results confirmed our intuition that our students are weakest in Math & Theory, although they are not as weak as we originally thought. The overall Foundational performance is not much higher than the overall Math & Theory performance. Students tend to be more interested in software application development, as such, we expected the overall Software Development performance to be higher than Foundational and Math & Theory, but the results are not as high as we would have guessed. The Software Development cluster includes upper division courses, so they have fewer students as some of the students from the



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Foundational cluster did not continue with the BSCS major. As such, we would expect that the Software Development cluster would indicate a more significant performance improvement over the Foundational cluster. However, the upper division courses become more demanding.

Perhaps most striking is the overall student performance in the Systems clusters. These courses are considered quite difficult by our students and we would have thought student performance in this area to be the lowest, or at least lower than the Software Development cluster. While it is difficult to speculate the reasons for this result, one possibility is that students know these classes are hard and therefore they are mentally prepared to dedicate more time and energy to them. Students often end up doing better than they expect in these courses.

Subjectively, the data shows a lack of grade inflation in CS courses. GPA averages range from a C+ to a B-. A general rule is that an average grade in a CS course is about a B-. Thus the data confirms this practice. Although as a faculty, we do not have a universal agreement that a B- should be the average.

c. What will be done differently as a result of what was learned?

Discuss how courses and/or curricula will be changed to improve student learning as a result of the assessment. Include a discussion of how the faculty will help students overcome their weaknesses and improve their strengths.

While we need more internal discussion in the department about these results, it is clear that we need to focus energy on our improving student performance in our Foundational and Math & Theory clusters. It also suggests that we do not need to spend as much energy on making adjustments to our systems courses.

This data is only a snapshot and it will become increasingly useful as we track it over time and as we follow cohorts.

Other changes in terms of assessment analysis include only extracting data for majors that continue. In this analysis, it included GPA data for students in the lower division courses who later change out of CS.

Finally, last year we completely revised the curriculum for the BSCS degree. As such, the clusters will need to be reworked in light of the new program. Also, the data collected this year cannot be directly incorporated into our long term studies. We will begin our long term data collection in AY 2009-2010.



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3. **Attach a copy of the components of the department/program assessment plan that have been modified since its initial submission:**
 - a. Program Mission
 - b. Program Learning Goals
 - c. Program Learning Outcomes
 - d. Program Learning Rubrics aligned with outcomes
 - e. Curriculum map that shows the courses that pertain to the outcome

We did not make significant changes to our original assessment plan. One minor change was to move CS 414 Compilers from the Systems cluster to the Software Development cluster as after reviewing the CS 414 content.

We envision more changes to the plan based on this report and analysis and the BSCS curriculum changes. We intend to have these changes in place by Fall 2009.

Please return to: Provost Office by June 1, 2009

You can send your replies as either a Word attachment (to: marin@usfca.edu) or as a hard copy to: Provost Office, Lone Mountain Rossi Wing 4th floor.

If you have any questions, please contact: William Murry, Director of Institutional Assessment (wmurry@usfca.edu or x5486).