

Assessment of Student Learning Plan (ASLP): Academic Programs

2015-16 Academic Year

University of Southern Maine

A. College, Department, Date

College Science Technology & Health
Department Computer Science
Date 5/27/2016

B. Contact Person for the Assessment Plan

Name and title Dr. Bob Boothe, Dept. Chair

C. Degree Program

Name of Degree Program Bachelor of Science in Computer Science

D. Assessment of Student Learning: Program Assessment

Step 1: Identify the Student Learning Outcomes (SLO's)

- a. Do you have your student learning outcomes published on your department's website? [Yes]

at <http://usm.maine.edu/cos/mission-statement-department-computer-science>

- b. Please identify **which of your student learning outcome(s) were assessed this past academic year.**

There were no assessments in Fall 2015. In Spring 2016, we assessed the following courses for the listed outcomes:

COS 350 - outcomes (a) (c) (k)

COS 420 - outcomes (c) (d) (i) (k)

COS 457 - outcomes (b) (e) (f) (i)

The outcomes are:

- (a) an ability to apply knowledge of computing and mathematics appropriate to the discipline
- (b) an ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
- (c) an ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
- (d) an ability to function effectively on teams to accomplish a common goal
- (e) an understanding of professional, ethical, legal, security and social issues and responsibilities
- (f) an ability to communicate effectively with a range of audiences
- (g) an ability to analyze the local and global impact of computing on individuals, organizations, and society
- (h) recognition of the need for and an ability to engage in continuing professional development
- (i) an ability to use current techniques, skills, and tools necessary for computing practice.
- (j) an ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
- (k) an ability to apply design and development principles in the construction of software systems of varying complexity.

- c. *Do you have a **matrix or curriculum map** showing when your student learning outcomes are assessed and in which courses? [Yes]*

Assessment map:

Spring 2016 (even spring)

COS 350 (a) (c) (k)

COS 420 (c) (d) (i) (k)

COS 457 (b) (e) (f) (i)

Fall 2016 (even fall)

COS 360 (b) (h) (j)

COS 450 (b) (e) (f) (i)

Spring 2017 (odd spring)

COS 398 (e) (f) (g) (h)

COS 485 (a) (j)

Step 2: Assessment Methods Selected and Implemented

- a. *Identify which direct measures (other than course grades), that were used to determine whether students achieved the stated learning outcomes for the degree.*

Our assessments are direct measures using rubrics for specific assignments or exam questions designed to evaluate achievement of a specific learning outcome.

- b. *Briefly describe when you implemented the assessment activity, and if a scoring rubric was used to evaluate the expected level of student achievement. (This information may be shown on your curriculum map).*

COS 350 - outcomes (a) (c) (k)

COS 420 - outcomes (c) (d) (i) (k)

COS 457 - outcomes (b) (e) (f) (i)

Scoring rubrics were used for all assessments

Step 3: Using the Assessment results to Improve Student Learning

- a. *Briefly describe your unit's process of reviewing the program assessment results (i.e. annual process by faculty committee, etc).*

At the end of each semester we have a department meeting where we share and discuss our assessment results and discuss plans for future changes.

- b. *What changes have been or will be made to improve student learning, as a result of using the program assessment results?*

Our changes are generally about spending more course time on difficult subjects. In the past we have changed COS 161 and COS 285 from 3 to 4 credit to add labs and more course time to cover material better. These have both been valuable changes.

Final conclusions from this year's assessments:

COS 350

My goal for these assessments is for an average score of at least 4.0, corresponding to the "Very Good" level of performance. I expect there will always be some lower performing students that do not reach this level.

Objective A - Apply knowledge of computing and mathematics: Systems programming frequently involves bitwise manipulations such as setting and resetting various flag bits as well as shifting and masking out bit-fields in sub-field encoded values. We see examples many times throughout the course, however

when I assessed their ability to perform similar tasks on the exams, many students performed poorly. The average assessment score was 2.59, far below my target.

Changes: Next year I will increase the amount of class time spent on this topic.

Objective C - Design and Implement Computer Based System: Students like to write programs and overall did very well on this aspect of the course. The average assessment score was 4.81. I am satisfied with student achievement in this area.

Objective K - An ability to apply design and development principles in the construction of software systems of varying complexity: For the last two programming assignments students write concurrent programs using UNIX processes (fork, exec, and wait) and also threads (pthreads, create, join, mutex, and condition variables).

I am assessing their ability to apply the principle of concurrency taught in the course to create correctly executing concurrent programs. Many students have difficulty with this, but ultimately most succeed in getting their programs working correctly. The average assessment score was 4.66. I am satisfied with student achievement in this area.

COS 420

Overall, I was pleased with the student progress in this course. Most came in with little understanding about how to approach and solve a large, complex, software development project and by the end of the course the majority of the students were able to demonstrate good skills in requirements definition, design, implementation and team work. Every group was able to bring their project to a very high quality level by the end of the course.

As the data shows, teamwork is still a work in progress. In a very few cases, there was very little participation in the code development process. May need some way to identify this earlier on and develop very draconian measures to get engagement (or drop).

Used a Github classroom account (<https://classroom.github.com/>) that allows a course/faculty member to have private repositories. Github and the classroom feature worked superbly. Issue tracking, milestones, and commits that were associated with issues were significant improvements over the Atlassian/local git repository method in the last time the course was offered.

COS 457 – not ready at the time of this report

c. Date of most recent program review/self-study?

ABET accreditation visit October 2014.

E. Course Assessment Activities: *Is your program able to report any assessment-related activities at the Course-Level... (i.e. created grading rubrics to use in required courses, examined student progress in entry-level courses, developed a new course, etc)? Please briefly explain any assessment projects.*

We are very concerned about the high number D, F, I & W grades in our introductory classes. We are piloting a Python class for non-majors and we are investigating using a flipped classroom model in our introductory Java course.

F. Community Engagement Activities in your departmental curriculum:

a. Does your department have a student learning outcome that is related to any community engagement activities? If so, please state the outcome.

NO

b. Please indicate what community engagement activities are included in your program's curriculum, and whether the activities are required or optional for students in your major.

<u>Community Engagement Activity</u>	<u>Included</u>	<u>Required/Optional</u>	
Student Research (related to a community-based problem)	___	R	O
Student-Faculty Community Research Project	___	R	O
Internship, or a Field Experience	___	R	O
Independent Study (community-related project)	___	R	O
Capstone Course (community-related project)	___	R	O
Service-Learning (course-based)	___	R	O
Study Abroad, or an International Program	___	R	O
Interdisciplinary Collaborative Project (community related)	___	R	O
Student Leadership Activities (related to a team project)	___	R	O
Students/Faculty Community Leadership (advisory boards, committees, conference presentations)	___	R	O
Other Activities (not mentioned above):			

c. Please list any courses (i.e. EDU 400) that have a community engagement activity in your program.

Entry-level courses:
Mid-level courses:
Upper-level courses:

Reminder: Please complete and submit this form by the end of the academic year, May 2016.