

Lincoln University

Computer Science Major Program Assessment Plan

Term Spring 2011 Assessment Cycle Fall 2010- Spring 2011

Mission Statement

The Computer Science Major program is designed to prepare the students for a profession in a Computer Science or a related field as well as graduate studies in Computer Science or a related field. The primary aim is to raise the level of participation in technical fields by promoting student creativity.

I. Spring 2011 Assessment Plan Overview

The faculty of the department of Computer Science as well as one faculty from Mathematics (for discrete Math) will collect course Student Learning Outcome data for the courses they teach for the computer science curriculum based on the direct and indirect assessment methods outlined in this report. They will each analyze their data and make a report for each class that can include recommendations for their courses as well as the program. The faculty reports will be summarized in the 2010-2011 assessment cycle report and will be combined with data from the Fall 2010 interim report (generated already). The faculty will also meet approximately every two weeks to review all recommendations from the prior assessment reports for possible implementation. If any recommendation is resolved i.e. implemented, it will be noted in the Spring report as such. The spring 2011 assessment report will be completed and submitted to the Dean of School of Natural Science and Mathematics by April 30, 2011. (It is possible that SLO results for the database management course: INF-354 to be measured and collected by a faculty from the BIT department in Spring and included in the Spring 2011 CSC Assessment report. Database Management course is offered in the BIT department in addition to computer science department. The CSC department also plans to provide SLO results for CSC-158 to the BIT department at the end of the spring 2011).

II. Computer Science Major Program Goals

A variety of employment and graduate study opportunities exist for qualified computer science graduates. The following are the primary goals for the program of the Bachelor of Science degree in Computer Science at Lincoln University:

1. To produce outstanding graduates who can apply a combination of creativity and logic in problem-solving, complemented with outstanding computer technology skills.
2. To ensure that Lincoln University Computer Science students are academically well-prepared for successful matriculation in graduate programs of study in Computer Science or a related field such as Information Systems.

3. To ensure that Lincoln University Computer Science students are academically well-prepared for gaining employment as Computer Programmers, Software Engineers, and System Analysts.

III. Program Student Learning Outcomes

After completing the Bachelor of Science degree in Computer Science, the student should be able to:

1. Demonstrate mastery of a minimum of three programming languages such as Visual C++, Java, and Visual BASIC in terms of both grammar and the set of commands. The student's learning will include procedural, object-oriented, event-driven, and GUI/ component-based programming as well as general understanding of formal languages and compilers
2. Solve problems and analyze algorithms and be able to apply and implement the theoretical foundation of computation in computers. The students must become skillful in solving mathematics, science, and business problems, and be able to analyze and apply algorithms in solving problems in these and other disciplines.
3. Read, analyze, organize, and use data. The students must become competent in managing data. This includes, database design and modeling, and using the proper data structures to organize and store data, so that it can be used as information.
4. Demonstrate mastery of the fundamental concepts of computer organization and fundamentals of computer architecture, mostly from a software developer's point of view. This includes understanding the logical gates, how CPU executes machine instructions, how the operating systems handles multitasking jobs, etc.
5. Read and write technically and communicate ideas in the discipline.
6. a) Demonstrate skills in advanced features of commercial computer application software in the areas such as spreadsheets, database, web programming, and computer animation and demonstrate skills in applied computer science.
 b) Demonstrate strong mathematical skills and be able to apply it to computer Science.

IV. Direct Assessment Methods:

Primary

- a) Written Tests & Quizzes
- b) Programming Projects
- c) Homework Assignments
- d) Computer Lab work
- e) Practical test (done on the computer)
- f) Presentations
- g) Papers (technical writing)
- h) Database Projects
- i) Software Engineering Projects

Additional Direct Methods

- a) Internship Presentation Papers
- b) Internship supervisor evaluation papers
- c) Project portfolio collected in CSC-498 (capstone course for CSC majors)
- d) [An exit exam is in plan during Spring 2011]

V. Indirect Assessment Methods:

- a) Entrance Interview
- b) Exit Interview
- c) Supplemental Instruction Surveys (new in Spring 2011)
- d) Other course-based student surveys
- e) Internship/ Job placement statistics
- f) Graduation/ retention rates

VI. Spring 2011 Assessment Process Outline for CSC Major Program

Phase 1.

During the Spring 2011 semester, each instructor will utilize an assessment spreadsheet, recording and tracking the students skills in each course Student Learning category via the measuring tools designated for each part of the course. Project assessment rubrics are used for assessing most programming projects. Questions on the tests/ final exams target assessment of different learning goals and are used to measure bulk of the student learning. Point system is used to assess the student's learning on each test using point system rubrics. The students earn points on each question based on setup, the degree of accuracy, and logical follow-through, and the general ability to write code when applicable. In some upper level CSC classes, student will write technical papers (rubrics for papers and presentations will be used). The course SLO ratings are currently based on the following point system guidelines

4. Secure ($\geq 88\%$ of total points **earned in a given SLO category**)
3. Satisfactory ($\geq 73\%$ & $< 88\%$ of total points)
2. Needs improvement ($\geq 58\%$ & $< 73\%$ of total points)
1. Unacceptable ($< 58\%$ of points earned)

Meetings:

Faculty of the department will meet on regular basis to discuss the assessment plan in order to ensure that the implementation and the assessment process can continue to improve. Faculty will also review the recommendations from previous reports to consider for action.

Phase 2. At the end of Spring 2011 semester, each instructor of a class (section of a course) will use the standardized Computer Science department electronic SLO sheets to report each student's learning outcome in their classes (based on their own class assessment sheets as mentioned in phase 1). The Department standardized spreadsheet automatically calculates the class SLO average and standard deviation in each category. The frequencies for learning proficiency levels for each SLO categories and also attendance, final grade frequencies, and Pass/Fail frequencies will also be tabulated for each spring 2011 class.

Phase 3. The instructors will analyze their course data and make other observations and will report it to the department using either the course report sheets designed by the department or their own format.

Phase 4. Other supporting data will be collected at the end of each semester by direct and indirect methods (mentioned earlier) by instructors, chair, or the coordinator of the CSC program. The Computer Science Majors will fill the *Entrance Interview Form* soon after declaring major in Computer Science and will fill the *Exit Interview Form* in their senior year. Those students, who carry internships under the course CSC-299, will fill the *Internship Form* and their work supervisor will assess the students' internship work using the *Student Internship Evaluation Form*. The Computer Science senior's portfolio will be assessed using the *Senior Portfolio Evaluation Form*. The Computer Science senior's portfolio will be assessed using the *Senior Portfolio Evaluation Form* under the capstone course CSC-498.

Phase 5. At the end of the Spring 2011 semester, the computer science coordinator (or in future the CSC/ Department assessment committee) will collate all primary data at the courses level as well as any supporting data available and will summarize into a 2010-2011 Assessment cycle report.

Phase 6. The Fall 2010-Spring 2011 cycle report will include general program level trends as well as course level trends and results (Fall 2010 and Spring 2011) for courses taught by all instructors along with some long term trend results as well as actions taken or recommended based on the following underlying principles.

- Every student has the potential to learn all listed learning skills and reach the secure level.
- Examine the effectiveness of courses and program.
- Improve the student learning outcomes.
- Improve the course contents.
- Improve teaching methods.
- Maintain high standards regarding course contents
- College education is open-ended and ever changing (particularly in computer science and technology).
- Include and encourage student creativity.

VII. Examination of Current Assessment Process for Possible Future Updates

The department has been adhering to an underlying data-driven assessment process that that has been placed for several semesters. However, every phase of the current assessment process including the methods of data collections will be revisited and re-examined, to ensure improvements in all categories of the assessment process during each semester through regular assessment meetings by faculty. The effectiveness of the current process will be discussed and debated in evaluating computer science students' learner outcomes as well as the effectiveness of the computer science program.