

Annual Assessment Summary

COMPUTER SCIENCE

**Department of Mathematics,
Computer Science,
and Economics**

January 2006

Part 1: Objectives

1. Educate its students to be lifelong learners who will advance knowledge and serve the world through the application of humanistic values and scientific principles. (College Objective)
2. Prepare students for positions in organizations, which require a strong mathematics, computer science or economics background. (Department Objective).
3. CS graduates should be able to communicate ideas and arguments in a well-organized, clear, efficient and precise way both orally and in writing, using appropriate computing terminology and be able to work in groups and as teams. (Computer Science Objective)
4. Graduates should be able to apply logic, fundamentals of computing, software science, software development methodology and tools to developing computer systems and applications. (Computer Science Objective)
5. Graduates should be able to analyze, design, implement, and evaluate a computerized solution to a real life problem using appropriate tools. (Computer Science Objective)
6. Graduates should solve problems in a wide variety of computing related fields at the BA/BS level, demonstrating knowledge of these areas, creative thinking, and problem solving skills and teamwork. (Computer Science Objective)

Part 2: Assessment Planning Charts

A. Direct Measures

Objective #	Assessment(s)	Type #	Data/results	Action Taken/Recommendations
2	Calculus I and II gateway examinations.	1	Students demonstrate computational and mathematical maturity	The collection of these examinations needs to be formalized.
3, 5	Capstone project in CS552, Software Engineering.	5	Students are able to communicate ideas and arguments in a well-organized, clear, efficient and precise way both orally and in writing and are able to analyze, design, implement, and evaluate a computerized solution to a real life problem	
4	Homework and project submissions in courses CS220, CS250, CS350, CS444 and CS552 (via homework submission system)	4	Students are able to apply logic, fundamentals of computing, software science, software development methodology and tools	
6	Homework and project submissions in courses CS444 and CS552 (via homework submission system)	4	Students are able to solve problems in a wide variety of computing related fields at the BA/BS level	

A. Indirect Measures

Objective #	Assessment(s)	Type #	Data/results	Action Taken/Recommendations
1,2,3,4,5,6	CS Student exit interview form.	10	Results indicate that students are satisfied with their knowledge and skills appropriate for entry into the computing professions or graduate study.	Additional topical course offerings added to curriculum (CS315, Java).
1,2,6	Annual CS Advisory Council Meeting ("Meet the Graduates" event)	11	Results indicate that students are satisfied with their knowledge and skills appropriate for entry into the computing professions or graduate study.	The addition of CS444 (database course) is based on these meetings.

Part 4: Evaluation Rubric for Assessment System

Factors	Rubric Score	Evidence/Rationale
Level A		
Professional standards and student learning outcomes	3	Standards used in assessment of student performance are based on the computer science program standards promulgated by the IEEE Computer Society.
Faculty Involvement	3	The computer science faculty in the department consists of two faculty members who are both involved in the process.
Assessment alignment	2	Assessment instruments that assess the ideas and skills specified in the learning goals are effective at evaluating whether and how thoroughly students have learned those concepts via comparison to computer program standards.
Level B		
Assessment structure	3	Assessments are multiple, regular and comprehensive.
Data management	3	An automated data collection system has been implemented to capture student homework, project and capstone experience information.
Data collection points	3	An automated data collection system has been implemented to capture student homework, project and capstone experience information.
Data collection sources	3	Data is collected from students, recent graduates, faculty and other professionals. Additional infrastructure to capture and retain Calculus I & II gateway examinations needs to be established.
Program improvement	3	Additional topical course offerings added to curriculum (CS315, Java) as well as the addition of CS444 (database course)
Level C		
Comprehensive and integrated measures	2	No cut-off criteria have been established.
Monitoring student progress & managing & improving operations & programs	3	Measures are routinely used to manage and improve programs as evidenced by additional program offerings incorporated into the program.

Factors	Rubric Score	Evidence/Rationale
Assessment data usage by faculty	3	The computer science faculty in the department consists of two faculty members who are both involved with assessment.
Assessment data shared with students	1	Assessment data is not shared with current students.
Fairness, accuracy & consistency of assessments	3	The efforts to date have been judged to be fair and accurate by the faculty conducting the assessment activities.

B. General Findings

The Mathematics, Computer Science and Economics Department has established a **Vision Statement** establishes the values and philosophy of the department. It was established with a view to the broad directions and aspirations of the department and its programs.

The established **Departmental Goals and Objectives** focus on the general aims or purposes of the program and curriculum. The goals set the broad, long range intended outcomes, wishes, desires, hopes and intentions of the departmental majors as well as describes what is provided in terms of content, skills developed, attributes, areas covered and broad knowledge/values, perspectives expected of all program graduates

The established **Computer Science Objectives** provide brief, clear statements of learning outcomes of computer science instruction. Attention is focused on the specific types of performances that the students are expected to demonstrate at the end of instruction.

Assessment is not an end in itself, but a vehicle for educational improvement. We believe that its effective practice begins with and establishes a vision of the kinds of learning we most value for students and strive to help them achieve. Assessment recognizes the value of information in the process of improvement. But to be useful, information must be connected to issues or questions that people really care about. The point of assessment is not to gather data and return results. It is a process that starts with the questions of the faculty, that involves them in the gathering and interpreting of data, and that informs and helps guide continuous improvement. Based on this philosophy, the assessment data generated for the computer science program is evaluated on a qualitative basis. Since the numbers of both student and faculty involved in the program is small, this qualitative approach serves its intended purpose.

The calculus I and II gateway examinations serve as way to assess student performance in obtaining a strong mathematics foundation. We have found these instruments to be indicative of student's future performance in the computer science program. At present, review of these documents is done on an ad hoc basis. The collection and review of these instruments needs to be formalized.

The CS552 capstone course integrates knowledge, concepts, and skills associated with an entire sequence of study in the CS program. This method of assessment is unique because the course becomes the instrument for assessing student teaching and learning. Evaluation of students' work in CS552 is used as an important means of assessing student outcomes and driving program changes.

Assessment practices embedded in the academic courses generate information about what and how students are learning within the program and classroom environment. Course-embedded assessment takes advantage of already existing curricular offerings by using

standardized data instructors already collect. This data is routinely captured via the student homework submission system, which has been in place since 2004.

Student interviews have become increasingly important tool for understanding the educational needs of students. When combined with other assessment instruments we have successfully used surveys to produce important curricular and co-curricular information about student learning and educational experiences. During this interview process, students are asked to reflect on what they have learned as CS majors in order to generate information for program improvement. These surveys have been performed for the prior 5 years.

Surveying of alumni and industry professionals is a useful assessment tool for generating data about student preparation for professional work, program satisfaction, and curriculum relevancy. Alumni surveying provides us with a variety of information that can highlight program areas that need to be expanded or enhanced. The survey process is conducted during the annual "Meet The Graduates" event. This event has been conducted for the prior 5 years.

C. Future Goals

Overall the CS assessment effort is characterized by careful attention to detail as well as routine data collection and reflection on the meaning of that data. To date we are pleased with our assessment program and are striving to maintain the intensity of the effort.

D. Resources needed to implement assessment system

Present resources are sufficient for our needs.