Goals of the Program in Computer Science

The primary goal of our program is to prepare our graduates to understand the field of computing, both as an academic discipline and as a profession within the larger context of society. We try to achieve this goal in several ways. We provide a broad and coherent coverage of the discipline. We expose our students to the theory underlying the field. We expose our students to the ethical and societal issues associated with computers. We prepare our students to apply their knowledge to specific computing problems and to produce solutions, both independently and as members of teams. We structure the program in such a way that it supports and is supported by the educational goals of the University and the Division of Liberal Arts and Sciences.

Specific Knowledge Objectives

Every student who graduates with a B.S. in Computer Science is expected to have learned the following:

1) Hardware
   The structure of the hardware that makes up a computer system, and the digital logic on which the hardware depends.

2) Data Representation
   The various forms in which data is represented within a computer.

3) Machine Language
   How a computer program is executed at the machine instruction level.

4) Interpreters and Compilers
   The connection between low level languages and higher level languages.

5) Concepts of Programming Languages
   The principles that guide the design of high level languages.

6) Principles of Structure and Object Oriented Programming
   Principles of good programming, including choice of data structures, algorithm development, implementation, testing and debugging, and maintenance.

7) Performance and Optimization of Algorithms
   The mathematical foundations of computer science.
8) Operating System Concepts
   The principles on which operating systems are designed.

The Assessment Procedure

   The Computer Science subdepartment uses a number of different methods to assess the extent to which student outcomes meet the stated objectives.

Capstone course

   All students are required to take C435 Operating Systems, which they typically do during their final semester in residence at IUSB. This course covers the fundamental principles of operating systems, including process management and scheduling, memory management, file system design, and input/output processing. In addition, students complete the design and implementation of a simulated multi-tasking operating system. The course, offered once a year, therefore draws upon a broad variety of skills and knowledge that students have acquired in their other courses in the major.

   Objectives assessed: primarily 8, with elements of 1, 2, 3, 4, and 6.

Performance reviews

   Some of the courses in the major typically involve the presentation of significant projects to the instructor and other students in the course. C308 Analysis and Design, offered every year, and C463 Artificial Intelligence, offered every other year, are two courses that currently contain this component. Further, students who take Y398 Internship in Computer Science, or who work with faculty members on individual research projects are often called upon to make public presentations of their work.

   Objectives assessed: elements of 1, 2, 3, 4, 5, 6, 7, and 8 may be present, depending upon the specific project.

Faculty Inventory

   During several sub-department faculty meetings throughout the year, faculty perceptions of student outcomes plays a predominant role. For instance, during the 1996-1997 academic year, the sub-department has discussed whether a change of programming language will be effected in the first programming course, requiring extensive reflection on program objectives and anticipated student outcomes. Such faculty inventories are thus a continuous process engaged in by all members of the sub-department.

   Objectives assessed: elements of 1, 2, 3, 4, 5, 6, 7, and 8 may be present,
depending upon the topic addressed.

Alumni Survey

The sub-department will mail a survey to each of its graduates during their second and fifth year after graduating in order for graduates to provide feedback on their experiences at IUSB.

Objectives assessed: In addition to broadly assessing each of the items 1 -- 8, it is hoped that this survey will assess other aspects of the program that are currently being overlooked by the faculty.

Student Survey

Every three years, the student chapter of the Association of Computing Machinery, in consultation with the sub-department faculty, will conduct a survey of all computer science majors in order to assess their current experiences at IUSB. Surveys will be compiled by student representatives, and all personally identifying data will be stripped from the summaries presented to the faculty so as to preserve student confidentiality.

Objectives assessed: in addition to broadly assessing each of the items 1 -- 8, it is hoped that this survey will assess other aspects of the program that are currently being overlooked by the faculty.

Program Reviews

Every seven years, an external reviewer with expertise in Computer Science will be asked to provide a comprehensive review of the sub-department. In addition, the sub-department will provide its own comprehensive self-evaluation of its program.

Objectives assessed: items 1 -- 8.

GRE's, and Graduate School Admissions:

The sub-department will keep historical data on scores that its students achieve on standardized exams such as the Advanced GRE exam in Computer Science, as well as admissions into graduate school.

Objectives assessed: items 1 -- 8, particularly with respect to the GRE examinations.

Instructor/course evaluations

At the end of each course, instructors solicit anonymous feedback from students about all aspects of the course and instruction. These evaluations use a standardized evaluation form
developed by the Department of Mathematics and Computer Science, and are administered in accordance with the guidelines established by the Division of Liberal Arts and Sciences in order to ensure full participation, confidentiality, and timely feedback to the instructor.

**Objectives assessed:** items 1 -- 8, depending upon the course.