

# Computer Science Department

## BRIEF MISSION STATEMENT

- Educate computer science majors in a rigorous B.S. degree program so that graduates are prepared to enter high-quality technical professional positions or go on to graduate programs.
- Provide computer education that serves the needs of various student components of the University.

## EXPANDED MISSION STATEMENT

### B.S. Degree Program

#### *Introduction*

The B.S. in Computer Science is designed to prepare students for success as computer science professionals. This implies that our curriculum must be continually modified in light of current industrial practices and national curriculum recommendations in this rapidly changing field. Students graduating from this program should be able to apply their knowledge to a specific design problem, including detailing the specifications, analyzing the problem, and providing a design and implementation that functions as desired, has satisfactory performance, is reliable and maintainable, and meets desired cost criteria. A broad background in the humanities and social sciences, together with a course emphasizing professional ethics, provides students a basis for understanding the societal implications of the work being performed. Students finishing this program should also be prepared for graduate studies in computer science.

#### *Curricular Program*

Students in the computer science program take 37 semester hours of required computer science courses plus 12 hours of computer science electives. The required courses provide breadth across many different areas of computer science, such as algorithms, computer organization and architecture, data structures, theoretical foundations, programming languages, operating systems, and software engineering; elective courses such as graphical user interfaces, systems programming, database design, networks/data communication, compiler theory, graphics, and artificial intelligence, round out the students' computer science education. In addition, students are required to take one year of physics, one additional science course, one year of calculus, three additional mathematics courses (linear algebra, probability, numerical analysis), and a technical writing course. Many computer science courses are heavily project-oriented, and integrate oral and written communication skills.

## ***Learning Objectives***

The Computer Science Department has adopted the following learning objectives for graduates of its B.S. degree program.

### **Programming Methodology**

1. Understand classical algorithmic processes and data structures
2. Be proficient in one high-level programming language
3. Have basic skill levels in a variety of programming languages
4. Be aware of programming language design issues and various language paradigms (object-oriented, event-driven, imperative, functional)

### **Computer Organization and Architecture**

5. Understand the basics of logic design
6. Understand computer organization
7. Be aware of multiple architecture approaches

### **Theory and Computational Mathematics**

8. Be competent in techniques of discrete mathematics
9. Understand the theoretical foundations of computing through automata theory and formal languages
10. Be able to perform simple analysis of algorithms

### **Software Systems**

11. Understand the steps of the software development process and the activities/products appropriate to each
12. Know the major issues in operating system design.
13. Understand the basics of file processing and database organization

### **General**

14. Be able to adapt to changing development platforms and design/implementation tools
15. Communicate effectively on technical matters in both oral and written forms
16. Understand the social/ethical issues of computing

## **EXPANDED MISSION STATEMENT**

### **Service Courses**

#### ***Introduction***

The Department offers a suite of "service courses" designed for non-computer-science majors (see table below). All of these courses are heavily laboratory-oriented, giving students considerable hands-on experience. In order to assist students in mastering the technologies they encounter in these courses, the Department has developed a number of

learning aids, including specialized laboratory manuals, specialized software, audio-visual tutorial files, and carefully structured laboratory exercises.

<b>Course</b>	<b>Title</b>	<b>Description</b>
CS 100	Principles of Computer Science	A survey of the field of computer science, intended as a general education course.
CS 101	Microcomputer Applications Software	Use of modern software applications, especially as applied in a business environment. Required for pre-business students.
CS 102/ Math 111	Microcomputer Applications for Sciences	Use of modern software applications, especially as applied in a science environment. Required for marine science students.
CS 110	Visual Basic Programming	A gentle introduction to windows-based programming.
CS 200-201	Web Technology I and II	Web page authoring, client-side and server-side scripting. Part of certificate program in E-Commerce Technology and Business.
CS 300	Web Site Management	Issues and technology of web server management. Part of certificate program in E-Commerce Technology and Business.

### *Learning Objectives*

The Computer Science Department has adopted the following learning objectives for students in its service courses.

1. Be competent in using up-to-date software as appropriate for the course.
2. Be able to apply software tools in a problem-solving environment as appropriate for the course.
3. For those courses required for other majors, regularly consult with those departments to keep the course content consistent with their needs.