

Computing Programs at BYU

INFORMATION SYSTEMS

Information Systems (IS) professionals leverage technology to solve business problems. BYU's programs emphasize technology by requiring programming skills and incorporate collaborative teamwork in resolving the managerial, operational and behavioral aspects of IS. Students are taught to understand both technical and organizational factors required to provide competitive advantages for information and technology-enabled business processes. They can build databases and dashboards focused on delivering the value of business intelligence (BI). They focus on integrating solutions that enhance and meet the information and operational needs of businesses and other enterprises.

Graduates often play a key consultant role in analyzing and determining an organization's IS requirements and are active in their specification, design, and implementation. They are adept at both adapting and adopting change and can serve as an effective bridge between the technical and management communities within an organization. BYU IS graduates can design, build, and implement applications used in technology-based organizational communication and collaboration systems which enhance web, mobile, security, BI, and business operational environments.

COMPUTER SCIENCE

Computer science touches virtually every area of human endeavor. Software is responsible for everything from the control of kitchen appliances to sophisticated climate models used in predicting future environmental change. Students in computer science learn to approach complex problems in business, science, and entertainment using their strong backgrounds in mathematics, algorithms, and data structures.

The degree programs in the Computer Science Department at BYU prepare students to be confident software developers and technical problem solvers. BYU's computer science graduates are known for solid preparation in the fundamental principles of the discipline. In addition to the core computer science courses, students are given the opportunity to broaden their analytical and scientific skills by completing course work in physics, statistics, and mathematics. This knowledge is then applied as students study the deep theoretical underpinnings of the science in class and in laboratory work, associated with most courses. This broad foundation gives students the power to maintain their skills and functionality in the rapidly changing world of technology.

COMPUTER ENGINEERING

Computer engineering is concerned with the design and construction of computers and computer-based systems. It involves the study of hardware, software, communications, and the interaction among them. Its curriculum focuses on the theories, principles, and practices of traditional electrical engineering and mathematics, and applies them to the problems of designing computers and computer-based devices.

Computer engineering students study the design of digital hardware systems including communications systems, computers and devices that contain computers. They study software development, focusing on software for digital devices and their interfaces with users and other devices. CE study may emphasize hardware more than software or there may be a balanced emphasis. CE has a strong engineering flavor.

Currently, a dominant area within computing engineering is embedded systems, the development of devices that have software and hardware embedded in them. For example, devices such as cell phones, digital audio players, digital video recorders, alarm systems, x-ray machines, and laser surgical tools all require integration of hardware and embedded software, and are all the result of computer engineering.

INFORMATION TECHNOLOGY

Information technology is a label that has two meanings. In the broadest sense, the term “information technology” is often used to refer to all of computing. In academia, it refers to undergraduate degree programs that prepare students to meet the computer technology needs of business, government, healthcare, schools, and other kinds of organizations. In some nations, other names are used for such degree programs.

In the previous section, we said that *Information Systems* focuses on the “information” aspects of “information technology”. *Information Technology* is the complement of that perspective: its emphasis is on the technology itself more than on the information it conveys. IT is a relatively new discipline which started as a grass roots response to the practical, everyday needs of business and other organizations. Today, organizations of every kind are dependent on information technology. They need to have appropriate systems in place. Those systems must work properly, be secure, and be upgraded, maintained, and replaced as appropriate. People throughout an organization require support from IT staff who understand computer systems and their software, and are committed to solving whatever computer-related problems they might have. Graduates of information technology programs address these needs.

IT programs exist to produce graduates who possess the right combination of knowledge and practical, hands-on expertise to take care of both an organization’s information technology infrastructure and the people who use it. IT specialists assume responsibility for selecting hardware and software products appropriate for an organization, integrating those products with organizational needs and infrastructure, and installing, customizing and maintaining those applications for the organization’s computer users. Examples of these responsibilities include: the installation of networks; network administration and security; the design of web pages; the development of multimedia resources; the installation of communication components; the oversight of email products; and the planning and management of the technology life-cycle by which an organization’s technology is maintained, upgraded, and replaced.