COMPUTING
DEGREES & CAREERS

Association for Computing Machinery
Advancing Computing as a Science & Profession

Association for Information Systems

IEEE
IEEE computer society

TODAY'S HIGH-TECH GROWTH IS TOMORROW'S HIGH-TECH BOOM!

The need for computing professionals and executives right here in the U.S. is growing as companies become more global. Almost every major challenge facing our world is turning to computing for a solution, from conquering disease to eliminating hunger, from improving education to protecting the environment.

Job growth rates for computing professions from the United States Bureau of Labor Statistics can be summarized with one word: big. Today's market has big demand with big salaries for qualified professionals. Estimates for job growth in the United States range from 38% to 56% across the computing spectrum. With more choices and more opportunities, it's a better time than ever to begin a career in computing.

In fact, according to CNN/Money Magazine in 2006, software engineering is the number one best job for salary and opportunities!

Want in? A college degree in a computing major will make it happen. Although you typically don't need prior training in computing, your high school may have classes that can help you get a head start. Talk with your guidance counselor and your school's computer science teachers to learn more about the opportunities available to you now and in the future, or visit our website.

High school computer science classes are the gateway to studying any of the college computing majors outlined in this brochure. For more detailed descriptions of options in computing, please talk to your computer science teacher or guidance counselor, or go to the following website: computingcareers.acm.org

http://computingcareers.acm.org

Do you want to help build the next generation of mobile phones, tiny media players, and even high-tech clothing? Or create new and more advanced medical tools?

COMPUTER ENGINEERING (CE) students study the design of digital hardware and software including communications systems, computers and devices such as phones, MP3 players, DVRs, alarm systems, x-ray machines, and even laser surgical tools. Increasingly, CE specialists integrate customized hardware and embedded software, to improve existing technologies and invent new ones.

Do you love to solve puzzles? Invent new ways of using computers? Or exchange theories about new ideas?

COMPUTER SCIENCE (CS) spans the range from theory to practice to cutting-edge inventions. CS makes graduates aware of new technologies and new ideas and is a foundation for many different computing careers. Computer scientists do varied work. They design and build software and create efficient solutions to real-world problems in fields such as robotics, computer-enhanced vision, and digital forensics. Individual computer science programs allow students to specialize in one or more of these fields.

Do you enjoy finding better ways to get things done using computers? Are you interested in understanding how computers can make businesses work better?

INFORMATION SYSTEMS (IS) specialists design computing solutions that provide companies, non-profit organizations and governments with the information they need to achieve their goals. IS employs computer systems to implement and improve the way organizations work. IS professionals combine their knowledge of computing and organizations to bridge the gap between technical and business specialists. Most IS programs are found in business schools, and may go by such names as management information systems, computer information systems, or business information systems. All IS degrees combine business and computing topics, but the emphasis between technical and organizational subjects varies.

Are you the one everyone calls when they want their own web site? Are you the troubleshooter everyone turns to when their computer acts weird?

PROFESSIONALS IN INFORMATION TECHNOLOGY (IT) make a living solving, supporting, troubleshooting and designing – from web sites to networks, in organizations ranging from business and government to schools, health care, and more.

IT specialists possess the ideal combination of knowledge and practical, hands-on expertise to support both an organization's technology infrastructure and the people who use it. They're responsible for selecting hardware and software products appropriate for an organization. IT professionals create and manage web sites and networks to provide a secure, efficient, and productive environment for everyone.

Directors, composers, and architects – they all see the big picture. Do you? Creating software products involves a lot more than just writing code.

SOFTWARE ENGINEERS (SE) see the whole picture, too – the life cycle of a product, including efficiency and reliability, meeting customers' budgets, proper testing, and maintenance. Large, expensive software systems often play a vital role in safety-critical applications and are made up of many smaller building blocks. Software engineers combine experience in computer science, engineering, and math to design, define, and organize many aspects of a complex software product.

Software engineering courses are offered both within computer science study and as separate degrees. Both share some courses in common, and CS graduates who want to head up large development projects increasingly pursue software engineering in graduate school.

Medical Imaging

Doctors today can clean the arteries of a patient's heart, preventing a future heart attack. Modern medical imaging can reveal a detailed view of clogged problem areas – without any surgery. CAT scans, MRIs, and ultrasounds are all the products of computing professionals.

- Computer engineers design the hardware.
- Computer scientists devise the algorithms to process images from electrical impulses.
- Software engineers write software and ensure that it meets medical quality standards.
- IT professionals connect the imaging equipment to the rest of the high-tech hospital gear.
- Information systems specialists ensure that the right medical staff gets the right information at the right time.

In just a few years, doctors will be able to operate on patients half a world away using remote cameras and robotic arms. Computing professionals will continue to push the boundaries of medicine.

Finding Information on the Web

Most people use search engines such as Google and Yahoo every day. But search engines for the web could be much better than they are today. How about searching for objects in pictures? Or sounds? Scenes in movies? The web is constantly growing. Search engines need to learn what information means.

- Computer scientists devise the revolutionary approaches that makes search possible.
- Software engineers develop the products that dig up results.
- Specialists in information systems design solutions that allow search companies to sell relevant advertisements.
- Computer engineers design complex, high-performance networks to cope with immense quantities of data.

Search technology has a long way to go, and it will take many computing professionals to make that happen.

Online Music & Movie Distribution

One day you might tell your grandchildren stories about what television was like. The future of music, movies, and all media is on the Internet. From iTunes to YouTube, commercial entertainment is moving to the Web – fast. Most of the major studios plan to distribute films online. The entertainment industry is being shaken up and the whole revolution is powered by technology and computing professionals.

- Computer scientists design the huge databases that store music, TV shows, and movies.
- Specialists in software engineering, IT, and computer science work with artists to create attractive, engaging interfaces for consumers.
- Information systems professionals design the logic that keeps track of customers' interests and provides recommendations.
- Computer engineers built the iPod and other portable media devices on which we play our downloads.

Mobile Devices

Soon, the idea of using your cell phone only for voice will seem old-fashioned. You already text your friends, but mobile phones are rapidly becoming much more. They can access the Web, play games, and even tell you where you are right now. Soon you'll be able to press a key and instantly buy tickets to see your favorite band at a club you're just walking by. Or pay bus fare just by hopping onto the bus you want to take.

- Computer engineers develop smaller, less power-hungry chips.
- Computer scientists create compression algorithms to transmit information more efficiently.
- Information systems specialists design the connections between businesses and mobile customers.
- IT specialists make sure that the hardware and software used behind the scenes is up-to-date.
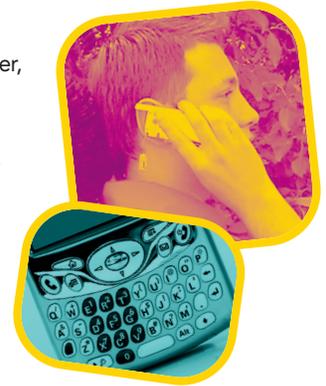
Gaming

The Microsoft Xbox 360. The Sony Playstation 3. The Nintendo Wii. They're all great gaming machines, but the technology behind them isn't a game at all – it's seriously powerful stuff. And games aren't just for kids anymore. Adults not only play today's video games, they create them, too. At the heart of these virtual reality platforms is cutting edge computing.

- Computer engineers produce faster, more powerful chips capable of displaying ever more lifelike characters in 3-dimensional worlds.
- CS and SE experts create the artificial intelligence that makes each game challenging, keeping players coming back for more.
- IT professionals support networks and infrastructure that enable game development.
- IS professionals create systems for keeping track of customer feedback, behavior, and demand.