



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

INFORMATION TECHNOLOGY (IT) professionals engage in procuring, securing, supporting, troubleshooting, and designing elements of the IT infrastructure. Their work covers a variety of contexts, from websites to databases and network applications, 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 websites and networks to provide a secure, efficient, and productive environment for everyone.

Directors, composers, and architects all see the big picture. Do you? Creating software 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.

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 computing teacher or guidance counselor, or visit

<http://computingcareers.acm.org>

Create, Discover, Innovate:

Smart Careers for a Digital Future

Sure, computers are fun and cool – but they also open doors to interesting, creative, and fulfilling careers. 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 (US-BLS) can be summarized with one word: BIG. Today's market has big demand with big salaries for qualified professionals. Computing occupations are estimated to grow rapidly over the next decade – many between 21% and 54% (US-BLS), far outpacing overall job growth in the United States. Software Developer/Engineer top at least two "Best Jobs" lists and Software Architects, IT Configuration Managers, Computer Systems Analysts, Network and Computer Systems Administrators, Information Security Analysts, Web Developers and Computer Network Architects are in several "Top 10" lists (*Forbes*, *CNN Money*, *U.S. News and World Report*). According to the National Association of Colleges and Employers computer science is the second highest-paid job at the bachelor's-degree level.

With more choices and more opportunities, it's a better time than ever to begin a career in computing. In fact, the US-BLS predicts that, for the foreseeable future, nearly 3 out of 4 new science or engineering jobs in the U.S. are going to be in computing, and that 140,000 brand new software developer jobs will be created by 2022. With the growing importance of topics like Big Data, Cybersecurity, and Human-Computer Interaction, the sky's the limit for careers in computing.

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

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Computing Degrees & Careers



Association for
Computing Machinery

Advancing Computing as a Science & Profession

Do you want to help build the next generation of smart phones, nanotech media devices, interactive robots, 3D virtual reality "holodecks," or even high-tech clothing? Are you interested in creating new and more advanced medical tools?

COMPUTER ENGINEERING (CE) professionals engage in the design of digital hardware and software systems and devices such as global communications systems, wearable implantable computers, smart phones, digital players, personal video recorders, internet alarm systems, high-tech body scanners, 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 or exchange theories about new ideas? Would you like to invent an app that helps rescue workers locate survivors?

COMPUTER SCIENCE (CS) professionals can conceive and create fun and valuable applications (apps) for social media and for all mobile operating systems including phones and tablets. 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 fields such as these. CS runs the gamut from theory to practice to cutting-edge inventions. It makes graduates aware of new technologies and new ideas and is a foundation for many different computing careers.

Do you enjoy finding better ways to get things done using computers? Are you interested in understanding how information systems can improve business processes and make organizations work better?

INFORMATION SYSTEMS (IS) professionals analyze, design, implement, and manage innovative technology-based solutions. They help modern enterprises in virtually any industry create value using information technology. IS professionals integrate their computing and business skills to radically improve the ways in which all organizations collect, manage, and use data to achieve their goals. They also facilitate communication between technical and business specialists in order to identify optimal IT solutions. Most IS programs are found in business schools or information schools.

Mobile Devices/Social Media

With more than seven billion subscriptions worldwide – covering more than 95% of the world's population – mobile technology is still growing. You probably spend more time texting on Snapchat, recording Vines, and Instagramming photos than dialing friends. Today's smartphone apps can name that song you can never remember, play graphically advanced and location-based games, and show your friends where you're having lunch – in real-time. You can deposit checks into your bank account with a snap of your camera phone, and, in some places, pay bus fare just by hopping onto the bus. Google Glass and smart-watches are already changing the way we experience the world, while fitness devices like Fuelband and FitBit track your body's every movement. And with the "Internet of Things" becoming a reality, these may only be scratching the surface of wearable computing's potential.

- Computer engineers design and develop smaller, less power-hungry chips.
- Computer scientists help design the user experience and create compression algorithms to transmit information more efficiently.
- Software engineers build social media networks and applications.
- Information systems specialists design the connections between businesses and mobile users and analyze massive quantities of data to personalize and improve social media experience.
- IT specialists make sure that the hardware and software used behind the scenes are up-to-date and that mobile networks are secure.



Gaming

Millions of people all over the world play Microsoft Xbox, Sony PlayStation, and Nintendo Wii, and millions more play games like Minecraft and Angry Birds on their phones every day. Oculus Rift and its cutting-edge eye tracking technology could change how every household experiences Virtual Reality. But the technology behind these devices isn't a game at all – it's seriously powerful stuff. And with the "gamification" of everything from social media and personal fitness to online education, games aren't just for kids anymore. Of course, adults not only play today's video games, they create them, too – as 3D modelers, animators, effects artists, graphics programmers, level designers, and more. At the heart of these virtual reality platforms is cutting-edge computing.

- Computer engineers design and 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 data mining and keeping track of customer feedback, behavior, and demand.



Digital Media and Entertainment

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 and YouTube to Amazon Prime and Netflix, commercial entertainment is moving to the web – fast. Thanks to video streaming, most of the major studios plan to distribute films online. The entertainment industry is being shaken up, digital rights management has become an essential field, and the whole revolution is powered by technology and computing professionals.

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



Online Search and Advertising

Most people use search engines like Google, Bing, 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 be taught what information really means, and it will take lots of new computing professionals to improve search technology as it evolves.

- Computer scientists devise the revolutionary approaches that make search efficient and accurate.
- Software engineers develop the huge programs that dig up and organize search results.
- Information systems specialists design solutions that allow search companies to match advertisements to user interests and conduct search analytics to measure and improve advertising value and performance.
- Computer engineers design high-performance networks and data centers to cope with immense quantities of data.



Medical Imaging

Doctors today can clean the arteries of a patient's heart, preventing a future heart attack, or operate on patients half a world away using remote cameras and robotic arms. Modern medical imaging can reveal a detailed view of clogged problem areas—without any surgery. Neuroimaging is being used to study the human brain and help people with disabilities regain control of their bodies. CAT scans, MRIs, ultrasounds, and 3D visualizations 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.

