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School of UNDERGRADUATE STUDIES

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Computer Science



Career Options for Computer Science Majors

This booklet contains specific information about majoring in computer science at The University of Texas at Austin, as well as career opportunities related to this major. The careers listed typically require a bachelor's degree, and special certification or training requirements are noted. Please use this booklet as an idea generator, rather than as a comprehensive list of all career options for computer science majors. The career descriptions were obtained from the Center for Strategic Advising & Career Counseling (CSA&CC) library resources and career websites (see listing of sources on last page).

The first section, "Direct Career Opportunities," includes careers that use the logic and problem solving skills acquired by computer science majors. The second section, "More Career Opportunities," lists careers that are potentially available to all natural sciences majors who have related experience or coursework.

For computer science majors, there are many career options that require a master's or doctoral degree but do not require any particular undergraduate degree. Examples of these include law, international affairs, museum administration, library and information studies, hospital administration, and many more. For careers requiring graduate education, please visit our library or speak to a career counselor.

The CSA&CC offers many other services and resources to help you with your career planning. These include:

- Career Counseling
- Career Assessment
- Career Information Library
- Internship Information
- Graduate School Planning Assistance

Visit our website at utexas.edu/ugs/csacc or call (512) 232-8400 for more information.

MAJORING IN COMPUTER SCIENCE AT THE UNIVERSITY OF TEXAS AT AUSTIN

Departmental Website: www.cs.utexas.edu

Campus Location: TAY 2.124

Phone Number: 471-7316

DESCRIPTION OF MAJOR

Computer science is the study of computer systems, networks, communication, software, computing techniques and its underlying theories.

EXAMPLES OF COURSES

CS 303E Elements of Computers and Programming

Problem solving and fundamental algorithms for various applications in science and business and on the World Wide Web. Introductory programming in a modern object-oriented programming language.

CS346 Cryptography

A theoretical introduction to cryptography. Topics include private key cryptosystems, public key cryptosystems, digital signatures, secret sharing schemes, and the necessary mathematical background.

CS 349 Contemporary Issues in Computer Science

Social, professional, and ethical issues involved in the use of computer technology. Topics may include software engineering ethics, computer safety and reliability, constitutional issues, intellectual property, computer crime, societal impact, emerging technologies, philosophical issues

CS 354 Computer Graphics

Introduction to techniques for human-machine communication through imagery. Topics include display hardware, transformations, interactive techniques, geometric modeling, two- and three-dimensional display algorithms, graphics software systems architecture, and hidden-line and surface elimination. Projects are assigned and in-depth exploration is encouraged.

Skills gained by Computer Sciences Majors:

Ability to cope with constant change

Ability to think logically

Abstract reasoning

Ability to work under pressure

Attention to detail

Computer Programming

DIRECT JOB OPPORTUNITIES

This sampling includes careers that use the logic and problem solving skills typically acquired by computer science majors.

Computer Game Designer

Design and program computer games by creating an overall concept, making a detailed outline, and programming all modules of the game. For smaller projects, one designer may do the design and the majority of the programming. For large projects, management, design, and programming tasks are done by different people. Practical experience and specialized skills such as 3-D graphics are very important.

Computer Security Specialist

Protect an organization's computer systems from viruses, data theft, fraud, and illegal intrusions. Establish programs to monitor security, educate users about good security practices, and cooperate with law enforcement officials in computer crime investigations.

Database Administrator

Manage operation and security of an organization's database systems. Verify accuracy of data and develop contingency plans for security problems. Coordinate development and use of data resources and represent database operations in interdepartmental meetings.

Database Analyst

Design databases to help businesses keep track of customer information, accounts, records, and inventory. Make changes in system to reflect new business practices, standards, or regulations. Provide reports so managers can use information effectively.

Data Miner

Analyze databases in government, business, or scientific applications to extract additional information or find useful patterns or correlations. Data mining is a multidisciplinary field, so coursework in math and statistics is helpful in addition to computer science. Some data miners specialize in areas such as biology (bioinformatics) or marketing. May require a graduate degree for positions beyond entry-level.

Internet Applications Programmer

Write programs to add features to websites such as animation or forms. Create tools to improve users' experience of the Internet such as subscription services or videoconferencing. Often work closely with webmasters and webpage developers.

Manager of Information Systems

Oversee all operations of an information systems department, including training, technical support, database operations, and networking. Supervise staff, prepare operating budget, create long-term expansion or upgrading plans, ensure efficient use of resources, and coordinate work with other department managers. Business coursework and/or experience is helpful. With a master's degree in business, this position can lead to Director of Information Systems or Chief Information Officer.

Network Analyst

Make long-range plans for installation or expansion of computer networks, configure network communication equipment, write scripts or programs to automate operations, and train network control operators. Can lead to position as Network Administrator, which involves more administrative and managerial work.

Scientific or Engineering Programmer

Write programs to simulate scientific phenomena, analyze experimental results, or apply science and engineering principles to research or manufacturing.

Software Engineer

Design and write software programs, usually as part of a development team. Determine user needs, write specifications, design overall structure of program, write and test code, and provide documentation.

Systems Administrator

Manage operation of multi-user computer network. Establish and maintain file servers, databases, Internet access, intranets, and security procedures. Configure and update hardware and software and provide assistance to users and managers.

Systems Analyst

Determine organization's information needs, write detailed specifications, choose programming tools and methods, supervise code writing, test program and get feedback, and solve problems and add requested features. Work can be done on a consulting basis with the job title of Systems Consultant.

Systems Integrator

Combine hardware and software from many manufacturers to create an optimal system to fit clients' needs. Oversee installation of new system and monitor its performance. Work for computer equipment manufacturers, consulting firms, or IT departments.

Systems Programmer

Develop operating systems, drivers, or software tools such as compilers and editors. May also develop new programming languages or adapting existing languages to specific needs.

Technical Support Representative

Answer questions from computer users, research answers to problems, and walk users through step-by-step solutions. With experience, can lead to position as technical support manager.

Technical Writer (Computer)

Write on-line help materials, books, manuals, and other documents that explain computer systems, software, operating systems, and programming tools to users. Work for publications departments of software companies, IT departments of other businesses, technical publishers, or on a freelance basis.

Trainer

Teach courses in operating systems or specific software in variety of settings, such as in-house corporate training programs, continuing education programs, vocational schools, children's camps, and employment training programs.

User Interface Designer

Design menus, icons, and other features that users interact with when using a software application or operating system. Consult with programmers and other designers.

Virtual Reality Programmer

Develop software that immerses users into virtual worlds where they can hear, see, feel, and interact with a computer-created environment. Strong graphics and design background is very helpful.

Webmaster

Create or maintain website either by providing content and programming or by supervising those who do. Monitor popularity and performance of site, respond to user feedback, and coordinate work of programmers, writers, and graphics specialists.

MORE JOB OPPORTUNITIES

This section lists other opportunities that may be available to all natural sciences majors. Entry into these careers usually requires internship or volunteer experience or relevant coursework in addition to a computer science degree. This is a sampling of job opportunities; for more options and ideas, please visit the CSA&CC career information library.

ADVERTISING/MARKETING/SALES

Buyer

Purchase merchandise directly from manufacturers and resell it to retailers (wholesale buyer) or purchase goods from wholesalers for resale (retail buyer). Become expert in particular kind of merchandise (such as technical equipment or software), stay informed about new trends, analyze customers' buying preferences, and decide what merchandise employer will sell.

Customer Service Representative

Interact with customers to provide information in response to inquiries about scientific and technical products and services and to handle and resolve complaints.

Green Marketing Analyst

Create innovative ways to introduce environmentally conscious products into the marketplace. Analyze sales data and consumer spending habits and consult with other marketing team members and graphic designers.

Pharmaceutical Sales Representative

Market a pharmaceutical company's products to physicians, hospitals, and pharmacists. Conduct sales meetings, give presentations, and maintain current knowledge about employer's products. Sales experience is helpful.

Scientific Sales/Service Manager

Direct the actual distribution or movement of a scientific or technical product or service to the customer. Coordinate sales distribution by establishing sales territories, quotas, and goals and establish training programs for sales representatives. Analyze sales statistics gathered by staff to determine sales potential and inventory requirements and monitor the preferences of customers.

BUSINESS

Health Information Administrator

Plan, develop, and supervise systems for the management of health records that are consistent with current medical, ethical, and legal requirements. Supervise medical records personnel, analyze patient and institutional data, develop in-service training programs, act as liaison to medical staff, safeguard confidentiality of health records, and testify in court as needed. Work for hospitals, clinics, rehabilitation centers, insurance companies, and nursing homes.

Management Consultant Analyst

Analyze business problems by collecting information from both internal and external sources, developing possible solutions, and then making recommendations to management team. Usually work for consulting firms, who hire recent college graduates for 2-3 year analyst positions.

Project Manager

Plan, administer, and coordinate projects that relate to product development, product improvement, research for new ventures, new product sales launches, or organizational structure. Develop product schedules, allocate resources, interface with vendors, and hire, train, and supervise employees. Work for companies that provide scientific or technical products and services.

Quality Control Analyst

Inspect, test, and audit materials, manufacturing processes, and products for compliance with company and industry quality standards. Develop quality assurance programs and prepare documentation reports. Work for companies that provide scientific or technical products and services.

Regulatory Affairs Specialist

Ensure that companies comply with government and industry laws and regulations concerning the development, manufacturing, and marketing of health care products such as pharmaceuticals, medical devices, biotechnology products, and nutritional supplements. Help company seek FDA approval for clinical studies and act as regulatory resource. Advise scientists and

project managers and review technical documents.

CORPORATE COMMUNICATION

Public Relations Specialist

Write articles for internal publications, write press releases, assemble press kits, arrange speaking engagements, assist in fundraising activities. Work in a variety of settings: business (especially in scientific, pharmaceutical, or biotech companies), government, non-profit, and education.

Technical Recruiter

Maintain contacts in the community and travel, often to college campuses, to seek qualified job applicants. Screen and interview applicants and make job offers. Stay up-to-date on organizational hiring policies, equal employment opportunity, and affirmative action guidelines. Work for scientific and technical companies, government agencies, and non-profit organizations.

Technical Writer

Write technical materials, such as equipment manuals, appendices, or operating and maintenance instructions. May assist in layout work.

Web Designer

Use knowledge of computer applications to translate client needs into artistically appealing website. Select color, text, and artwork and update/maintain site as needed. May use science knowledge to contribute to content of websites for scientific and technical companies.

EDUCATION

College Academic Advisor (Natural Sciences)

Advise natural sciences students at all levels about selection of courses, schedule planning, and other academic issues. May present seminars and workshops and develop and implement academic programs and refer students to other campus resources.

Corporate Trainer

Develop and conduct individual, group, and classroom training for employees on a wide variety of subjects. Develop training manuals, handouts, procedures, and supplemental training materials. Other duties involve test creation and administration for the advancement of employees.

Environmental Educator

Make students aware of environmental issues such as recycling, pollution, and conservation through classroom learning, hands-on activities, nature walks, and online presentations. Work for nature centers, aquariums, camps, zoos, botanical gardens, and parks. Developing an area of expertise such as wildlife or geology is helpful.

Secondary School Teacher

Instruct high school and junior high school students in scientific subject areas. Most secondary school teachers teach several courses in a single subject area. Public schools generally require certification; private schools typically do not.

Science Educator

Develop and implement science education programs. Create tours, demos, classes, workshops, films, field trips, and printed materials. Deliver educational outreach programs to schools and community centers. Provide instructional and curriculum support for teachers. Work for museums, science centers, planetariums, and programs sponsored by government agencies such as NASA and the National Science Foundation.

ENVIRONMENT AND OUTDOOR

Alternative Energy Specialist

Design and install systems that use renewable energy sources, such as glass and thermal solar panels and wind turbines. May act as liaison with utility companies. Entry-level technician jobs are available and some companies such as General Electric offer training programs for students.

Environmental Consultant

Offer recommendations to local, state, and federal government agencies and private businesses who need to adopt environmentally sound practices, adhere to environmental regulations, or clean up contaminated sites. Develop strategies for clients to improve air quality or design recycling programs. Research ecological impacts of development and recommend solutions to mitigate these impacts, especially for endangered or threatened species. Work for environmental consulting firms.

Environmental Science and Protection Technician

Perform laboratory and field tests to monitor the environment and investigate sources of pollution, including those that affect health. May collect samples of gases, soil, water, and other materials for testing and take corrective actions as assigned.

Forest and Conservation Technician

Gather information on condition of forest land tracts such as species and population of trees, insect damage, and potential fire hazards. Supervise and train forest workers in maintaining forests and their recreational facilities. Work for government agencies or large corporations in the lumber and paper industries.

Forester

Manage forest land for conservation, recreational, and economic purposes. Inventory timber and negotiate contracts for tree procurement and removal. Create strategies for conserving wildlife, soil, and water quality and monitor overall health of forest. Requires concentration of courses in biology.

Recycling Coordinator

Design and implement curbside and drop-off recycling and hazardous waste programs through city governments or private firms. Conduct public outreach campaigns to educate people about the advantages of recycling. May ensure compliance with ordinances or apply for grants.

GOVERNMENT

Environmental, Health and Safety Manager

Develop programs and processes for companies to ensure compliance with federal, state, and local laws. Requires thorough knowledge of environmental regulations such as the Clean Air and Clean Water Acts. Act as liaison with environmental regulators from government agencies.

Environmental Regulator

Enforce environmental laws to protect the health of people, plants, animals, and the environment. Grant permits to industrial and municipal facilities and measure pollution and emission levels. Alert media and the public to problems such as toxic spills and poor water quality. Collect samples and analyze data. Work for federal, state, and local government agencies.

Legal Assistant

Assist lawyers by researching legal precedent, investigating facts, or preparing legal documents. Conduct research to support a legal proceeding, to formulate a defense, or to initiate legal action. Often requires specialized coursework.

Patent Agent

Help businesses secure patents for new inventions such as pharmaceuticals, computer hardware, chemical processes, biotech products, and plant varieties. Work closely with inventors to prepare patent application. If registered by the U.S. Patent and Trademark Office (requires a bachelor's degree in science or engineering and passing score on examination), can represent companies in the patent application and discuss the application with patent examiners. Work for patent firms, law firms, corporate law departments, or on a freelance basis.

Patent Examiner

Review patent applications to assess compliance with regulations, determine scope of protection claimed by inventors, research relevant technologies to compare proposed patent with prior inventions, and communicate findings to patent agent or inventor. Work for U.S. Patent and Trademark Office.

HUMAN SERVICES

Americorps Volunteer

Serve full-time for a year in organizations and agencies throughout the country, work to fight illiteracy, improve health services, create businesses, increase housing opportunities, or bridge the digital divide. Benefits include an Education Award or an end-of-service stipend.

Child Life Specialist

Alleviate the stress of hospitalization for children and their families through play therapy and other kinds of counseling. Act as advocate and information source for children and collaborate with medical team.

Community Organizer

Establish and organize community groups to solve social problems in the community. Assess strengths and weaknesses of existing resources and propose changes. Promote cooperation and coordination among government agencies, nonprofit organizations, and other community groups. Conduct research, prepare budgets, and assist in fundraising.

Patient Advocate

Work to represent the interests of patients/consumers in healthcare settings. Explain medical procedures, services, and policies, help troubleshoot patients' concerns and problems, act as advocate for patient with health care staff. Provide resources, information, and referrals to patients and their families. Conduct training programs for medical employees.

Volunteer Coordinator

Recruit, train, schedule and provide supervision to volunteers at non-profit organizations. Arrange for on-the-job and other required training, supervision and evaluation of volunteers. Serve as liaison between administration, staff, and volunteers.

INTERNATIONAL

Foreign Service Officer

Analyze and report on political and economic developments, including agricultural trends, humanitarian and social conditions. Identify export markets, negotiate international agreements, and interpret US policies and interests for foreign governments, opinion leaders and the public. Issue visas to foreign nationals, provide development assistance, and arrange cultural exchanges.

Import/Export Agent

Coordinate settlements between domestic and foreign sellers and buyers. Oversee delivery of goods, supervise shipping and receiving, and act as trade representative. Oversee assessment of import and export taxes and handle any customs concerns.

Intelligence Officer

A member of the armed forces, police officer or civilian intelligence agency who specializes in the gathering, fusion and analysis of information and intelligence in order to provide advice to their government or another organization.

Peace Corps Volunteer

Peace Corps Volunteers work internationally in the following areas: education, youth outreach, and community development; health and HIV/AIDS; agriculture and environment; business development; and information technology. Within these areas, the specific duties and responsibilities of each volunteer can vary widely.

MEDIA/PUBLISHING

Copy Editor

Act as liaison between author, editor, and proofreader. Review manuscripts for grammar and style usage. May develop in-house style guide, supervise freelance staff, and handle author queries. Science degree is helpful for scientific publishing company and science textbook publisher.

Grant Writer

Write and develop grant proposals, which includes conducting needs assessments and matching product needs with available funding. Work for government or non-profit agencies.

Science Writer

Explain and describe scientific concepts and terminology in clear, simple language. Write textbooks, instruction manuals, documentary scripts, grant proposals, marketing materials, and website content. May specialize in areas such as marketing and public relations or medical writing. Conduct research, read background information, and interview scientists and experts. Work for companies, government agencies, nonprofit organizations, or on a freelance basis.

Scientific/Environmental Journalist

Investigate and write about issues of scientific and environmental interest, such as land conservation, pollution, and gene therapy. Investigate leads and tips, research topics, analyze documents, observe events, and interview experts. Work for magazines, newspapers, media companies, nonprofit organizations, or on a freelance basis.

Staff Writer

Research and write articles for magazine. May write article promos, short features, author bios, or photo captions. May work on freelance basis or for one particular magazine.

RESEARCH

Information Broker

Perform research for clients in business, healthcare, government, law, and science. Use Internet, database, and library resources to find specific information. May also analyze information, write reports, and train clients in information retrieval. Often work for consulting firms or on freelance basis.

Market Research Analyst

Research market conditions in local, regional, or national areas to determine potential sales of a scientific or technical product or service. May gather information on competitors, prices, sales, and methods of marketing and distribution. May use survey results to create a marketing campaign based on regional preferences and buying habits.

Publications Researcher

Research story and script ideas; maintain research files on topics and people; verify stories for accuracy. Work for newspaper, magazine, or book publishers, especially those related to science.

Public Policy Analyst

Provide information and suggest scientific policy initiatives to policy makers. Present findings to interested organizations and the media, analyze effectiveness of previous policies, and recommend changes based on findings.

Science Technician

Provide technical and laboratory support to scientists and engineers in manufacturing, research and development, and quality control. Assist with the development and evaluation of laboratory procedures, data interpretation, and problem solving. Collect data, monitor experiments, verify and analyze information, write technical summaries, and maintain lab supply inventories.

SOURCES

Career Opportunities in Science by Susan Echaore-McDavid.
Checkmark Books, 2003.

Careers in Health Care by Barbara Swanson. McGraw- Hill, 2005.

The ECO Guide to Career that Make a Difference by The
Environmental Careers Organization. Island Press, 2004.

Career Opportunities in Computers and Cyberspace by H.
Henderson. Checkmark Books, 2004.

Careers in Computers by Lila Stair and Leslie Stair. McGraw-Hill,
2002.

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