

Computer Science

Computers are everywhere, from inside our cars to on our desktops, and are affecting almost all aspects of our lives. Yet, for all of the things that computers and information technology can now do to make us more informed, productive, and connected, many opportunities still remain.

Computer scientists are experts on the subject of computation, both in terms of the theory of what fundamental capabilities and limitations of computation are, as well as how computation can be practically realized and applied. A computer scientist understands how to design and analyze algorithms that apply computation effectively, how to store and retrieve information efficiently, how computers work to deliver computation, and how to develop software systems that solve complex problems. Specialists within computer science might have expertise

in developing software applications, in designing computer hardware, or in analyzing computer algorithms, among many other current possibilities, and even more emerging specialties!

The new computer science (CS) program at the University of Michigan is available to students in both the Colleges of Engineering and of Literature, Science, and Arts. The program requires students to have a solid foundation in computer software, hardware, and theory, but also gives a student ample opportunity to take advanced electives in areas of computer science such as databases, architecture, networks, artificial intelligence, and graphics, or in emerging interdisciplinary areas such as electronic commerce, web information systems, and computer game design.

SKILLS & ABILITIES

The study of Computer Science develops the ability to solve problems using careful analysis and design techniques, as well as the ability to compare the relative effectiveness of various solutions. Implementation of a solution using software engineering principles is often the end-result of this process in a job setting. However, these

abilities may be applied to many different types of jobs in many areas of work. For example, while many CS graduates become software engineers at major software companies, many also go into other areas, such as consulting work at top business firms or management of hospital computing facilities.

Technical

Design and implementation of computer software
Evaluating alternative software solutions
Fundamental problem-solving strategies
Data representation and storage
Evaluation of computability
Developing computer hardware and operating systems
Writing technical documentation
Implementing data security

Analytical

Analyzing problems and their potential solutions
Thinking logically
Assessing needs
Reasoning algorithmically
Evaluating tradeoffs in software design and development
Solving complex design problems
Modeling and simulation of real-world activities

Communication

Writing program documentation
Training non-technical personnel
Technical writing
Oral presentation
Data visualization and presentation

Organizational

Working in teams
Coordinating tasks
Planning complex projects
Integrating different approaches

OCCUPATIONAL OPPORTUNITIES

A Bachelor's degree in Computer Science provides the foundation for a wide range of occupations in the computer industry ranging from design and development of complex software systems to testing and maintenance of existing software. In addition, computer software special-

ists are now needed in most areas outside the computer industry, including business, education, research, entertainment and the arts, and the medical fields. Those occupations marked with an * generally require additional graduate study.

Technical	Research/Education/ Health Care	Business/Finance	Information Systems/ Communication
Software engineer	Applications programmer	Technical consultant	Telecommunications analyst
Systems analyst	Systems programmer	Software developer for e-commerce	Systems security specialist
Applications programmer	Medical systems administrator	•Financial engineer	Database administrator
Systems programmer	Data analyst	•Business manager	Technical writer
Network manager	•Professor/teacher		•Intellectual properties attorney
Digital arts and entertainment programmer	•Physician		

CURRICULUM REQUIREMENTS

The Computer Science program requires five pre-declaration courses, Math 115, 116 and 215, and CS 203 and 280. In addition, approximately 48 hours of CS courses and related electives are required. Minimum departmental

grade requirements must be met at all levels of the CS program. For complete information on all CS requirements, including electives, please refer to the department web site at <http://www.eecs.umich.edu>.

FOR MORE INFORMATION

For information about choosing a career, about graduate/professional school, internships, or job descriptions, and for library resources:

The Career Center
3200 Student Activities Building
(734) 764-7460
<http://www.careercenter.umich.edu/>

Engineering Career Resource Center
230 Chrysler Center
(734) 647-7160
<http://career.engin.umich.edu/>

For general information about choosing a major in LS&A and about concentration and degree requirements:

LS&A Academic Advising Center
1255 Angell Hall
(734) 764-0332
<http://www.lsa.umich.edu/saa/>

For general information about choosing a major in Engineering and about concentration and degree requirements:

Engineering Advising Center
1009 Lurie Engineering Center
(734) 647-7106
<http://www.engin.umich.edu/>

For more specific information about the CS concentration and degree requirements in either LS&A or Engineering:

EECS Undergraduate Advising Office
3415 EECS
(734) 763-2305
<http://www.eecs.umich.edu>