

# UB Department of Computer Science and Engineering

## BA and BS in Computer Science (CS)

### Facts About CSE@UB

#### FAQ:

Full-time faculty: 38 Typical  
CSE class size: 50 Average

starting salary for  
undergraduate degree holders:  
\$63,402

#### CSE degrees offered:

- BA, BS in computer science
- BS in Computer Engineering
- A five-year path to a combined BS/MS in Computer Science
- A five-year combined BA in CS + MBA
- MS, PhD in Computer Science and Engineering
- BS in Bioinformatics

#### Research centers directed by CSE faculty:

- Buffalo Center for Biomedical Computing (BCBC)
- Center of Excellence in Document Analysis and Recognition (CEDAR)
- Center of Excellence for Information Systems, Assurance, Research, and Education (CEISARE)
- Center for Unified Biometrics and Sensors (CUBS)
- CSE department faculty are affiliated with the Center for Cognitive Sciences

### Computer Scientists: Transforming Society with Critical Technologies

Computer and information technologies are critical to the nation's technological infrastructure and competitive advantage in today's knowledge-based global economy. These technologies have enabled discoveries and inventions in diverse fields of study, and have transformed society and our daily lives in dramatic ways.

Computer Science (CS) is a systematic study of the concepts, foundations and applications of software, hardware, and intelligent systems. Typical subjects include: programming languages, data structure, algorithms, computer organization, operating systems and machine learning.

Computer scientists are engaged in understanding the algorithmic complexity of problems and the limits of computability, automating human intelligence, providing ubiquitous access to information, or designing secure and effective software, computer, and communication systems. Computer scientists work in every sector of industry, government, and society in general.

#### Computer scientists may use their knowledge to:

- Administrate database management systems software;
- Analyze problems in hardware, software, and systems;
- Design, test, and evaluate network and communications systems;
- Meet an organization's system software and infrastructure needs;
- Work as researchers, or inventors, innovating to solve complex problems, and create or apply new technology. CS research may be multidisciplinary, such as developing and advancing uses of virtual reality, extending human-computer interaction, or designing robots.

### Curriculum Overview

Both the BA and the BS in Computer Science prepare students well for graduate work or for professional positions in computing and information technology fields. The primary difference is that the BS program provides a more concentrated approach to computer science, while the BA program encourages students to combine computer science with studies in another field.

#### Freshman–Sophomore

The first two years build a strong foundation in object-oriented programming, data structures, and digital systems. During the first two years, CS majors also develop the necessary foundations in calculus, probability/statistics, and discrete mathematics. The student also takes a two-semester sequence in any science discipline during this period.

#### Junior

The junior year is devoted to the study of algorithms, programming languages, computer organization, and theory of computing. These courses continue to provide important core concepts necessary for more advanced study of both hardware and software systems.

#### Senior

The first three years prepare students to take a pair of required courses in the senior year: software engineering and operating systems. The final year is devoted to the elective courses in topics such as, software systems, networking and artificial intelligence.



A new building will house the departments of Computer Science and Engineering and Electrical Engineering.

### Careers for UB CSE Grads

Opportunities for computer scientists exist locally, nationally, and internationally. Our degree-holders have joined top companies, including Apple, Amazon.com, Bloomberg, Cisco, General Electric, Google, Hewlett-Packard, IBM, Intel, Kodak, Lockheed Martin, Microsoft, NASA, Nokia, Disney and Xerox.

### Did You Know?

- According to the US Bureau of Labor Statistics, employment for computer scientists is projected to increase 38 percent through 2016, much faster than the average for most occupations. Our graduates are aggressively recruited by top companies nationwide.
- CS graduates often receive scholarships to pursue masters and doctoral studies at prestigious institutions.



Undergraduate CSE students working together.

# UB Department of Computer Science and Engineering

## BA and BS in Computer Science (CS)



CSE students gather at the annual CSE picnic.

### World-Class Faculty

CSE faculty members:

- are recognized internationally for their research. Faculty members include fellows of major professional computing societies and editorial board members of prestigious journals.
- have received outstanding teaching awards, including the SUNY Chancellor's Award for Teaching Excellence, the Milton Plesur Award for Teaching Excellence, and the UB Alumni Association's Richard T. Sarkin Award for Excellence in Teaching.
- have collaborative research ties with major computing companies, including IBM, Microsoft, Google, Intel, Cisco, Nokia, Kodak, and Xerox.

### Internship Opportunities

Many of our students gain work experience during their undergraduate studies. Some students find computing-related employment in the summer. Others get experience through internships, which may offer academic credit. Graduates often state that these experiences gave them a competitive advantage during their job-search and facilitated a smoother transition to full-time employment.

### Student Clubs and Activities

Many CS undergraduates join the UB's Association for Computing Machinery (ACM) student chapter, the CSE Undergraduate Student Association, and the IEEE Computer Society student chapter, which provide opportunities to interact with students, faculty, and community members who share similar interests and career goals. They also sponsor a number of events, including programming contests, guest speakers, and social events.

### Undergraduate Research

CSE offers undergraduates ample opportunities to engage in creative research. Undergraduates may obtain academic course credit while acquiring valuable research experience under world-class faculty. CSE faculty are at the forefront of their chosen fields of expertise, and students may engage in research on a variety of topics: pattern-recognition, high-performance computing, algorithms and complexity, artificial intelligence, medical image processing, multimedia systems, optical, wireless and sensor networks, computer security and information assurance, software systems and languages, computer architecture, and Very Large Scale Integrated (VLSI) systems.

### Successful Alumni



CSE Professor & Chair  
Aidong Zhang

CSE Professor and Chair Aidong Zhang is Principal Investigator and Program Director of the Buffalo Center for Biomedical Computing. Her 200-plus research publications cover diverse topics including bioinformatics, geographic information systems, content-based image retrieval, distributed database systems, multimedia database systems, digital libraries, and database mining. Zhang's prestigious grants and awards include a National Science Foundation CAREER award, a National Institutes of Health grant to establish a pre-Center for Biomedical Computing, the SUNY Chancellor's Research Recognition Award, and the UB Exceptional Scholar Award.



Teaching Associate  
Professor Carl Alphonse

CSE Teaching Associate Professor Carl Alphonse is active in the Computer Science Education community, regularly organizing workshops on the teaching of object-oriented programming. He is a founding member and first president of the Western New York chapter of the Computer Science Teachers Association, an organization that supports and promotes computing education in grades K-12. He is also interested in pedagogical tools for teaching, such as the student oriented software design tool called "green," originally developed with support from an IBM Eclipse Innovation Grant, and further developed by undergraduate students in the department.



CS alumnus Nick Triantos

**Nick Triantos** (BS CS '91) is the CEO of TokBox, provider of a web-based video communication product. He holds MBA degrees from Columbia University and UC Berkeley's Haas School of Business. Triantos's background includes senior positions at Quantum Technology Partners and NVIDIA and engineering positions at Navio, 3DO, and Apple.



CS alumna Judy Hwang

**Judy Hwang** (BS CS '01)  
**Software Engineer, Applied Sciences Group**  
"My education gave me the tools I needed to be involved in exciting and important work. As a software engineer, I write the software that makes products, like our cardiac monitor, work. We're taking the latest and the greatest from computer technology and biology – and then merging the two. It's really groundbreaking."

To apply, please visit [admissions.buffalo.edu](http://admissions.buffalo.edu).

## CONTACT INFORMATION

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