

# Graduate Programs in Computer Science

UMBC

AN HONORS  
UNIVERSITY  
IN MARYLAND



Named the #1 up-and-coming national university by *U.S. News and World Report* three years running, UMBC offers an exceptional and affordable education.

UMBC has continually proven itself to be a leader in science and engineering education. The Computer Science and Electrical Engineering Department is made up of 39 full-time faculty members and 15 research professors who dedicate themselves to teaching as they pursue their own research in the field.

According to the Department of Education's National Center for Education Statistics, UMBC ranks fourth among U.S. research universities in the production of IT degrees and certificates.

Currently, the department boasts over 250 graduate students from around the globe. Recent graduates have gone on to work at top companies such as Google and Microsoft, government organizations like NASA, and defense companies like Northrop Grumman.

## M.S. in Computer Science

Students pursuing a Master's of Science (M.S.) in Computer Science can choose from a thesis and non-thesis option. The thesis option requires the completion of a thesis that must be defended with an oral examination and approved by the student's master's thesis committee. In addition, thesis M.S. students must complete 30 credit hours, including 3 core courses, 1 breadth course and 6 credit hours of research. The non-thesis option requires the completion of a scholarly paper. In addition, non-thesis M.S. students must complete 33 credit hours including 3 core courses and 3 credits of CMSC 698. Both options must be completed within 5 years and students must maintain a minimum G.P.A. of 3.0.

## Ph.D. in Computer Science

Students pursuing a Doctorate of Philosophy (Ph.D.) in Computer Science are required to complete 33 credit hours, including 3 core courses, 1 breadth course and 18 credit hours of doctoral dissertation research. Ph.D. students must complete and defend their dissertation, pass the comprehensive portfolio, and pass the preliminary examination and admission to candidacy. In addition, Ph.D. students must complete a minimum of three years of full-time graduate study, with at least one year of full-time study at UMBC. The program must be completed within 4 years after admission to doctoral candidacy and students must maintain a G.P.A. of 3.0.

### Core Courses

CMSC 611: Advanced Computer Architecture  
CMSC 621: Advanced Operating Systems  
CMSC 641: Design and Analysis of Algorithms

In addition to the core courses, a wide range of elective and special topics courses are offered in areas such as: cybersecurity and information, natural language processing, databases and data mining, mobile and wearable computing, cognitive systems and architectures, semantic web, machine learning, and networking and sensors.

The Computer Science graduate program is research active. Faculty members receive funding from organizations such as the Department of Defense, NASA, NSA, NSF and NIST. Our faculty members are actively pursuing exciting research in a variety of specialized areas such as:

## Research Areas

- **Artificial Intelligence:** Intelligent decision support, semantic representations and ontologies, interactive AI systems, preference modeling, reasoning under uncertainty.
- **Machine Learning and Data Mining:** Knowledge-intensive learning, preference learning, unsupervised perceptual learning, privacy-preserving data mining, ML applications.
- **Multi-Agent Systems:** Trust modeling, self-organizing agent networks and swarm systems, wireless sensor networks, mobile applications, context-aware systems.
- **Web 2.0:** Semantic web, knowledge discovery and modeling, policy models, service-oriented computing.
- **Graphics and Visualization:** Light and shading, realistic and artistic rendering, graphics hardware, understanding data, use of color and texture for visualization, perceptual studies and evaluation.
- **Game Development:** Use of computer science concepts in game programming, especially graphics and AI, networks, parallel programming, and databases. Multidisciplinary team development.

**To Apply** Visit <http://www.csee.umbc.edu/programs/graduate/application-process/> OR send an email to [gradDirector@csee.umbc.edu](mailto:gradDirector@csee.umbc.edu)