DEPARTMENT OF COMPUTER SCIENCE

Computer Science is the study of modern computers including their design, applications, programming and theoretical foundation. Since computers are now used in virtually every business, governmental agency, educational institution, and research enterprise, students who obtain a background in computer science position themselves well to be technology experts in almost any profession. For half a century computing machinery and software applications have gone through very rapid evolution which continues today. Computer science specialists are particularly well prepared to understand and adapt to the continuing changes in the field.

Employment opportunities are to be found in a wide variety of corporations, state and federal agencies, research laboratories, and other organizations. Although the opportunities offered students are many and varied, it must be recognized that the rapid rate of change of our technology imposes the responsibility of continuing study in order to remain current in this field.

Majors/Emphases

The Computer Science major prepares students for a wide range of careers using computer technology. Graduates are prepared to use modern technology and mathematical theory to engineer solutions that affect our daily lives. Depending on a student's choice of coursework within the major, a graduate could be prepared to work for a company needing a specialist in commercial software development, web site development and administration, systems programming, cybersecurity, industrial programming applications, database engineering, data analytics, artificial intelligence, or software engineering. Students obtaining a BSE degree can complete a minor or second major in Computer Science to be licensed to teach Computer Science in K-12 schools. The major also prepares students to begin graduate programs in Computer Science, Computer Engineering, or Cybersecurity.

The three emphases within the Computer Science major serve students with a variety of interests, backgrounds, and career objectives.
The **General** emphasis is targeted toward students who want to combine their study of computer science with a minor or second major in another area of study. Students who choose the **Comprehensive** emphasis are not required to complete a minor or second major; instead, they complete additional coursework in computer science, mathematics, natural science, and ethics. The **Applied Computing** emphasis is designed solely for students who have completed an Associate of Applied Science degree in Information Technology from an institution that has an articulation agreement with UW-Whitewater. A minor is not required for this emphasis.

The **Cybersecurity** major educates future Cybersecurity professionals to identify, prevent, detect and respond to security attacks that endanger the safety of property and people. Students in the program will learn to design and implement actionable security solutions by considering both human and technical factors. The practice-oriented learning environment will help prepare students to obtain positions such as security analyst, security engineer, security consultant, penetration tester, or security manager.

The Cybersecurity major includes three emphases.
The **Cybersecurity** emphasis allows student to pursue an additional minor or major of interest. The **Cyber Operations** emphasis provides a smooth transfer path for students with associate degrees in Cybersecurity from two-year technical colleges. The **Comprehensive** emphasis allows students to study multiple aspects of cybersecurity in depth, together with solid foundations in Computer Science, Mathematics, and8 Information Technology.

All Computer Science or Cybersecurity majors choose one emphasis when they declare the major. Students may change their emphasis at any time, but they are encouraged to consult with an academic advisor in the Computer Science department before doing so.

Minors

The minors offered by the Department of Computer Science allow students to build programming and data analysis skills that complement their major coursework and prepare them for a wide variety of careers.

The **Computer Science** minor builds a solid background in computing and related principles, which allows students to explore advanced or emerging areas of the computer science field. Students obtaining a BSE degree can become licensed to teach computer science in K-12 schools by completing this minor.

The **Web Site Development and Administration** minor gives students experience with the technologies used to build modern Web applications and equips students to form the technical core of a Web design team.

Students in the **Cybersecurity** minor learn about operational security in penetration testing, vulnerability analysis, system administration, intrusion detection, and incident response. They also learn to design and implement security features in the areas of cryptography-based secure network protocol design, secure operating system design, and secure software design.

The **Bioinformatics** minor, offered jointly with the Department of Biological Sciences, provides students with marketable skills that are required to solve computational problems in biological, biochemical, biomedical, and psychological research and in related fields.

The **Data Science** minor introduces students to this rapidly growing field and equips them with marketable problem solving skills and strategies needed to confront diverse analytic challenges. The curriculum of the data science minor covers conceptual, computational, and quantitative methods used to distill valuable patterns from the abundance of data that surrounds us.

Majors in Computer Science

- Computer Science - Applied Computing Emphasis (BA/BS) (http://uww-public.courseleaf.com/undergraduate/letters-sciences/computer_science/computer-science-applied-computing-emphasis/)
- Computer Science - Artificial Intelligence Emphasis (BA/BS) (http://uww-public.courseleaf.com/undergraduate/letters-sciences/computer_science/computer-science-artificial-intelligence-emphasis/)
- Computer Science - Comprehensive Emphasis (BS) (http://uww-public.courseleaf.com/undergraduate/letters-sciences/computer_science/computer-science_comprehensive/)
- Computer Science - General Emphasis (BA/BS) (http://uww-public.courseleaf.com/undergraduate/letters-sciences/computer_science/computer_science/)

- Cybersecurity - Comprehensive Emphasis (BS) (http://uww-public.courseleaf.com/undergraduate/letters-sciences/computer_science/cybersecurity_comprehensive/)
- Cybersecurity - Cyber Operations Emphasis (BS) (http://uww-public.courseleaf.com/undergraduate/letters-sciences/computer_science/cybersecurity-cyber_operations/)
- Cybersecurity - Cybersecurity Emphasis (BS) (http://uww-public.courseleaf.com/undergraduate/letters-sciences/computer_science/cybersecurity/)

Minors in Computer Science

- Computer Science (http://uww-public.courseleaf.com/undergraduate/letters-sciences/computer_science/computer_science_minor/)
- Cybersecurity (http://uww-public.courseleaf.com/undergraduate/letters-sciences/computer_science/cybersecurity-minor/)
- Data Science (http://uww-public.courseleaf.com/undergraduate/letters-sciences/computer_science/data-science-minor/)
- Web Site Development and Administration (http://uww-public.courseleaf.com/undergraduate/letters-sciences/computer_science/web_site_development_and_administration_minor/)

Certificates in Computer Science

- Computer Science Master's Bridge Program (http://uww-public.courseleaf.com/undergraduate/letters-sciences/computer_science/computer-science-masters-bridge-cert/)
- Web Site Development and Administration (http://uww-public.courseleaf.com/undergraduate/letters-sciences/computer_science/web_site_development_and_administration_certificate/)