

# COMPUTER SCIENCE AND INFORMATICS

## Computer Science

### Mission

The mission of the Computer Science Department is to provide a transformational educational experience in a Christian context through personalized mentoring and instruction, advanced scholarship, professional practice, and service that prepares our graduates for lifelong learning and ethically responsible leadership in the field.

### Programs

The Department of Computer Science offers a Bachelor of Science in Computer Science (B.S.C.S.) degree, a Bachelor of Arts (B.A.) degree with a major in Computer Science, a Bachelor of Science in Informatics (B.S.I.) degree with majors in Bioinformatics and Data Science, and a Bachelor of Science in Computing with a major in Computer Science Fellows (B.S.C.).

The **Bachelor of Science in Computer Science (B.S.C.S.)** degree is designed for students who desire a significant concentration in upper-level computer science topics and a solid foundation in mathematics and the sciences. The B.S.C.S. program is accredited by the Computing Accreditation Commission of the Accreditation Board for Engineering and Technology. Students select one of three areas of concentration in order to meet their career goals: computer science, software engineering, or cybersecurity. All concentrations include a common set of core topics in computing, preparing graduates to pursue careers in research, industry, or other computing-related fields. A graduate degree in computer science is recommended for those pursuing a research career.

The **Computer Science Concentration** focuses on providing a broad survey of topics in computing. It allows a wide range of options in advanced elective topics. This concentration provides a strong foundation for applying computing to a wide-range of areas.

The **Software Engineering Concentration** emphasizes the methods used to produce and maintain high-quality software in a systematic, controlled, and efficient manner. It combines computer science with topics more closely associated with engineering, such as quality assurance, project planning, and economic tradeoffs. In addition to Software Engineering I and II, which are required of all B.S.C.S. students, the concentration includes courses in software quality assurance, software project management, and engineering economics.

The **Cybersecurity Concentration** provides exposure to concepts, tools, and processes related to cybersecurity threats, vulnerabilities, and defensive mitigations. It combines computer science foundational coursework with both theoretical work and applied (e.g., laboratory) experiences that will ground students in the concepts, techniques, tactics, and procedures used to compromise and secure computer systems. The concentration includes courses in Introduction to Cybersecurity, Advanced Cybersecurity, Cryptology, Terrorism, and Cybersecurity Lab. Upon graduation, students will be prepared for a career in the cybersecurity industry.

The **Bachelor of Arts (B.A.)** degree with a major in computer science provides a traditional liberal arts education with a solid set of core courses in computer science. These courses provide the foundation necessary for a career in computer science. During the sophomore year, a student selects one of two areas of concentration in order to meet

specific goals. Students may choose a concentration program from computer science, or any approved minor in another discipline. The requirements for the B.A. with a major in computer science are presented in the College of Arts & Sciences section of this catalog.

The **Bachelor of Science in Informatics (B.S.I.)** degree offers majors in Bioinformatics and Data Science.

The major in **Bioinformatics** is a multidisciplinary program offered by the Department of Computer Science in conjunction with the Biology Department. The uniqueness of the program is the strong foundation it provides in both disciplines. Graduates may pursue careers in either computer science or biology, or in bioinformatics, a field that combines the two. The curriculum includes courses in biology, computer science, chemistry, and mathematics, as well as the humanities and social sciences. It is an excellent choice for students planning to enter one of the medical professions.

The major in **Data Science** is designed for individuals interested in interdisciplinary approach to data management and analysis in the digital age. The curriculum provides a strong foundation in programming, statistics, mathematics, and computing, with particular emphasis in cloud computing, machine learning and data mining. A major in Data Science also requires students to obtain a minor in a second discipline. Upon graduation, students with this major will be ready for careers in the emerging fields of Data Science, Data Analytics, and Data Management.

The **Bachelor of Science in Computing with a Major in Computer Science Fellows (CSF)** The Computer Science Fellows Program is designed for highly motivated students entering the School of Engineering & Computer Science with a wide range of interests who desire a more diverse experience across the disciplines. The program seeks to broaden Computer Science Fellows' backgrounds in their chosen area(s) of diversification while preparing them for graduate studies or for successful careers. The Computer Science Fellows is a major within the School of Engineering & Computer Science that allows Fellows to create an individualized course of study with the advice of a program Director who mentors them throughout the entire undergraduate experience. In the course of this mentoring process, the Director will in turn call upon the expertise of professors in other departments for assistance in serving the needs of the Fellow.

An important characteristic of the Baylor computer science programs is the integration of software, hardware, theory, and design methodology throughout the curriculum. A highly personalized education is provided by faculty dedicated to undergraduate education with small class sizes and modern laboratories. The programs are broadly based to prepare computer science graduates to handle the increasingly complex and ever-changing areas of computer science and bioinformatics.

- Bioinformatics, B.S.I. (<https://catalog.baylor.edu/undergraduate/school-engineering-computer-science/computer-science-bscs-informatics-bsi/bioinformatics-bsi/>)
- Computer Science Fellows, B.S.C. (<https://catalog.baylor.edu/undergraduate/school-engineering-computer-science/computer-science-bscs-informatics-bsi/computer-science-fellows-csf-bsc/>)
- Computer Science, B.A. (<https://catalog.baylor.edu/undergraduate/school-engineering-computer-science/computer-science-bscs-informatics-bsi/computer-science-ba/>)
- Computer Science, B.S.C.S. (<https://catalog.baylor.edu/undergraduate/school-engineering-computer-science/computer-science-bscs-informatics-bsi/bachelor-science-computer-science-bscs/>)

- Cybersecurity, B.S.I. (<https://nextcatalog.baylor.edu/undergraduate/school-engineering-computer-science/computer-science-bscs-informatics-bsi/cybersecurity-bsi/>)
- Data Science, B.S.I. (<https://catalog.baylor.edu/undergraduate/school-engineering-computer-science/computer-science-bscs-informatics-bsi/data-science-bsi/>)