

# **Computer Science B.S.**

## **Program Description**

The Bachelor of Science with a major in Computer Science program (BSCS) provides a blend of the foundations of computer science (CS) and applications in the information technology (IT) industry. The BSCS program emphasizes the study of computer systems architecture, software development, and data communications. Core technology areas include programming, computer architecture, operating systems, data communication, database systems, and software engineering. These areas are supported by a strong foundation in computing principles such as the design of programming languages, data structures, and operating system principles. The program includes a mathematics component and mathematics concepts are incorporated into many of the major courses.

Graduates of the CS program are prepared for a variety of careers in CS and IT, especially in the development of software for distributed systems. Example job titles from KSU graduates of the CS program include information technology specialist, programmer analyst, software engineer, network administrator, software developer, artificial intelligence engineer, back-end engineer/full stack developer, and software consultant. This program also prepares students for graduate studies in computing-related fields.



This program is a part of the College of Computing and Software Engineering.

## **Accreditation**

The Bachelor of Science with a major in Computer Science program is accredited by the Computing Accreditation Commission of ABET, <https://www.abet.org/>

## **Admission, Enrollment, and Graduation Policies**

### **Admission Requirements**

This program does not have specific admission requirements and only admission to Kennesaw State University is required.

### **Enrollment Requirements**

Progression through the program requires students to successfully complete or transfer the equivalent of CSE 1321, CSE 1321L, CSE 1322, and CSE 1322L with a grade of 'B' or better in all four courses.

## Graduation Requirements

Each student is expected to meet the requirements outlined in Academic Policies: 5.0  
PROGRAM REQUIREMENTS & GRADUATION.

## **Program Course Requirements**

### **Core IMPACTS Curriculum (42 Credit Hours)**

General Education Core IMPACTS Curriculum

### ***Core IMPACTS Curriculum Requirements Specific to This Major***

Science Majors: Must take MATH 1113 or higher in Mathematics & Quantitative Skills and MATH 1179 or higher in Applied Math.

Science and Engineering Majors: Must take two four-hour laboratory sciences in Natural Sciences. Students must choose from CHEM 1211/1211L, CHEM 1212/1212L, PHYS 1111/1111L\*, PHYS 1112/1112L, PHYS 2211/2211L\*, PHYS 2212/2212L, BIOL 1107/1107L, or BIOL 1108/1108L.

\*Students cannot take both PHYS 1111/1111L and PHYS 2211/2211L nor PHYS 1112/1112L and PHYS 2212/2212L.

### **Core Field of Study (18 Credit Hours)**

Students must earn a "C" or better in these courses.

- CSE 1321: Programming and Problem Solving I
- CSE 1321L: Programming and Problem Solving I Laboratory
- CSE 1322: Programming and Problem Solving II
- CSE 1322L: Programming and Problem Solving II Laboratory
- MATH 2202: Calculus II
- MATH 2345: Discrete Mathematics
- TCOM 2010: Technical Writing

### **Major Requirements (40 Credit Hours)**

Students must earn a "C" or better in these courses.

- CS 3305: Data Structures
- CS 3503: Computer Organization and Architecture
- CS 3502: Operating Systems
- SWE 3313: Introduction to Software Engineering
- CS 3410: Introduction to Database Systems

- CS 4306: Algorithm Analysis
  - CS 3622: Fundamentals of Data Communications
  - CS 4504: Parallel and Distributed Computing
  - CS 4308: Concepts of Programming Languages
  - CSE 3801: Professional Practices and Ethics
  - CS 4850: Computer Science Senior Project
  - STAT 2332: Probability and Data Analysis
  - MATH 3260: Linear Algebra I
- One (1) credit hour carried over from Applied Mathematics.
- One (1) credit hour carried over from Natural Sciences.

### **Major Electives or Concentration (15 Credit Hours)**

Complete a series of major elective courses OR select one major concentration and complete its requirements.

### **Major Electives (15 Credit Hours)**

Complete a minimum of 9 credit hours of CS 3000–4000 level coursework and 0–6 credit hours from the following list of courses:

- SWE 3633: Software Architecture and Design
- SWE 3643: Software Testing & Quality Assurance
- SWE 3683: Embedded Systems Analysis and Design
- SWE 4633: Cloud Software Development
- CSE 4983: CSE Computing Internship

### **Artificial Intelligence Concentration**

#### Required Courses (12 Credit Hours)

- CS 3642: Artificial Intelligence
- CS 4267: Machine Learning
- CS 4732: Machine Vision
- CS 4742: Natural Language Processing

#### Elective Courses (3 Credit Hours)

Select 3 credit hours from the following list of courses:

- CS 4277: Deep Learning
- CS 4491: Advanced Topics in Computer Science (in concentration)

- CS 4492: Undergraduate Research
- CSE 4983: CSE Computing Internship (in concentration)

### **Data Science Concentration**

#### Required Courses (12 Credit Hours)

- CS 4265: Big Data Analytics
- CS 4412: Data Mining
- CS 4422: Information Retrieval
- CS 4522: HPC & Parallel Programming

#### Elective Courses (3 Credit Hours)

Select 3 credit hours from the following list of courses:

- CS 4524: Cloud Computing
- CS 4722: Computer Graphics and Multimedia
- CS 4491: Advanced Topics in Computer Science (in concentration)
- CS 4492: Undergraduate Research
- CSE 4983: CSE Computing Internship (in concentration)

### **Cyber and Network Security Concentration**

#### Required Courses (12 Credit Hours)

- CS 3626: Cryptography
- CS 4612: Software Security
- CS 4622: Computer Networks
- CS 4626: Computer and Network Security

#### Elective Courses (3 Credit Hours)

Select 3 credit hours from the following list of courses:

- CS 4491: Advanced Topics in Computer Science (in concentration)
- CS 4492: Undergraduate Research
- CSE 4983: CSE Computing Internship (in concentration)
- IT 4823: Information Security Administration & Privacy
- IT 4833: Wireless Security
- IT 4843: Ethical Hacking for Effective Defense
- IT 4853: Computer Forensics
- IT 4883: Infrastructure Defense

**University Electives (5 Credit Hours)**

In accordance with KSU Graduation Policy, students must earn a grade of "D" or better in these courses while maintaining a minimum 2.00 cumulative GPA.

**Free Electives (5 Credit Hours)**

Select 5 credit hours of 1000–4000 level coursework from the University Catalog.

**Program Total (120 Credit Hours)**