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# COMPUTER AND INFORMATION SCIENCE (CSS)

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Averett offers Bachelor of Arts and Bachelor of Science degrees in two majors, Computer Science and Computer Information Systems. In addition, Averett offers minors in Computer Science and in Computer Information Systems to complement any major.

The purposes of courses in this department are to train students in the techniques, theory, and applications of computer science and information systems as well as in specific programming languages and computer systems. The two majors give students sufficient training to pursue any of the following:

1. A career in the public or private sector in a computer-related position.
2. Additional education at the graduate level in the areas of computer science, business, management information systems, and other quantitative fields.

The Computer Science Department believes the strengths of its programs are a direct result of its dedicated students, abundant and modern computer facilities and laboratories, small classes which allow good student-faculty relationships, personal attention from a faculty that places emphasis on quality teaching, and a faculty that is interested in and constantly aware of individual progress.

Students must attain at least a 2.00 grade point average in the major in order to graduate.

## Requirements for a Major in Computer Science:

In addition to the General Education requirements, the following courses are required:

	Semester Hours
CSS 211, Introduction to Programming I.....	4
CSS 212, Introduction to Programming II .....	4
CSS 231, Programming in C++.....	4
CSS 333, Data Structures .....	3
CSS 361, Topics in Computer Science I .....	3
CSS 372, Networks and Internets .....	3
CSS 381, Architecture and Assembly Language .....	3
CSS 411, Modeling and Simulation .....	3
CSS Elective at the 300-400 level.....	3
MTH160, Introduction to Statistics.....	3
MTH 201, 202, 301, Calculus I, II, III.....	9
MTH 211, Foundations of Higher Mathematics .....	3
MTH Elective at the 300-400 level .....	3
	Total 48

A student without previous computer experience would normally be expected to begin with CSS 113, Microcomputers and Application Software.

Suggested Electives: other computer science courses, courses in all areas of the sciences, mathematics, accounting and other business courses, and economics.

## Sample Four-Year Course Sequence: Computer Science

### Freshman Year:

CSS 211, Introduction to Programming I  
CSS 212, Introduction to Programming II  
MTH 201, 202, Calculus, I, II  
MTH 160, Introduction to Statistics

### Sophomore Year:

CSS 231, Programming in C++  
CSS 331, Data Structures  
MTH 301, Calculus III  
MTH 211, Foundations of Higher Mathematics

### Junior Year:

CSS 361, Topics in Computer Science I  
CSS 372, Networks and Internets  
MTH Elective at 300-400 level

### Senior Year:

CSS 381, Programming in Assembly and Machine Language  
CSS 411, Modeling and Simulation  
CSS Elective at 300-400 level

## Minor in Computer Science

The department offers a minor for those students desiring a strong support area for their major. The following courses are required for the minor in Computer Science:

	Semester Hours
CSS 113, Microcomputers and Application Software.....	3
CSS 211, Introduction to Programming I.....	4
CSS 212 Introduction to Programming II .....	4
CSS 231, Programming in C++.....	4
CSS Electives (2) at the 300-400 level.....	6
Total	21

Students must maintain a grade point average of at least 2.00 in the minor.

## Requirements for a Major in Computer Information Systems

In addition to the general education requirements, the following courses are required:

	Semester Hours
CSS 113, Microcomputers and Application Software.....	3
CSS 114, Web Authoring and Office Applications.....	3
CSS 211, Introduction to Programming I.....	4
CSS 212, Introduction to Programming II .....	4
CSS 271, Topics in Operating Systems.....	3
CSS 351, System Administration.....	3
CSS 372, Networks and Internets .....	3
CSS 375, Principles of Databases .....	3
CSS401, Project in Computer Science .....	1
CSS Elective at 200 – 400 level .....	3
BSA206, Business Communication (pre-requisite course) .....	3
BSA 221, Principles of Accounting I.....	3

BSA 305, Principles of Management .....	3
BSA 402, Quantitative Decision Making .....	3
BSA 434, Business Law .....	3
MTH 160, Introduction to Statistics .....	3
MTH 171, Applied Calculus or MTH 201 Calculus I .....	3
Total	51

### Sample Four-Year Course Sequence: Computer Information Systems

#### Freshman Year:

CSS 113, Microcomputers and Application Software  
MTH 171, Applied Calculus  
CSS 114, Web Authoring and Office Applications  
MTH 160, Introduction to Statistics

#### Sophomore Year:

CSS 211, Introduction to Programming I  
CSS 212, Introduction to Programming II  
BSA206, Business Communication  
BSA 221, Principles of Accounting I  
BSA 305, Principles of Management

#### Junior Year:

CSS 271, Topics in Operating Systems  
CSS 372, Networks and Internets  
CSS elective 200-400 level  
BSA 402, Quantitative Decision Making

#### Senior Year:

CSS 351, System Administration  
BSA 434, Business Law  
CSS 375, Principles of Databases

### Minor in Computer Information Systems

The following courses are required for a minor in **Computer Information Systems**:

	Semester Hours
CSS 113, Microcomputers and Application Software .....	3
CSS 211, Introduction to Programming I .....	4
CSS 212, Introduction to Programming II .....	4
CSS 305, Concepts of Information Systems .....	3
CSS 361, Topics in Computer Science I .....	3
CSS 372, Networks and Internets .....	3
CSS 445, Internship .....	3
Total	23

Students must maintain a grade point average of at least 2.00 in the minor.

## Human-Computer Interaction Program

Averett University offers a HCI program for students choosing as their primary major either art, computer science, computer information systems, or psychology. The program is administered by the department of psychology in consultation with an advisory committee composed of faculty members drawn from each of the contributing departments. The program is described on page 162.

## Teaching Endorsement

An endorsement in Computer Science may be added to another primary teaching area upon the successful completion of selected courses. In addition to the **General Education** requirements, the requirements for the endorsement are:

	Semester Hours
Two of the following: MTH 103, MTH 151, MTH 111, MTH 112, MTH 171, MTH 201, or any higher-numbered Math course .....	6
CSS 113, Microcomputers and Application Software.....	3
CSS 211, Introduction to Programming I.....	4
CSS 212, Introduction to Programming II .....	4
CSS 231, Programming in C++.....	4
CSS 251, Introduction to COBOL Programming.....	4
CSS 305, Concepts of Information Systems .....	3
CSS 333, Data Structures .....	3
CSS 361, Topics in Computer Science I .....	3
CSS 372, Networks and Internets .....	3
CSS 411, Modeling and Simulation .....	3
ED 474, Secondary/PK-12 Curriculum.....	2
ED 406, Instruction in Secondary/PK-12 Education.....	<u>3</u>
	Total 45

## Courses of Instruction

113 Microcomputers and Application Software (3)  
An introduction to computers and software application packages. Topics include hardware, DOS, windows, an introduction to the Internet, word processors, spreadsheets, databases, and presentations. No previous computer experience required.

114 Web Authoring and Office Applications (3)  
Intermediate and advanced topics in office application software and authoring for the web. Topics include HTML, Java Script, style sheets, macros, user interface issues in databases, and linking databases with web pages. Prerequisite: CSS 113.

211 Introduction to Programming I (4)  
A first course in programming. In addition to coding, debugging, and designing programs, topics include fundamentals of object-oriented design, design of user interfaces, loops, branching, static lists, sorting and searching, data types, and creating data files. Prerequisites or corequisites: MTH 103 or equivalent; CSS 113 or equivalent.

212 Introduction to Programming II (4)  
A continuation of CSS 211 emphasizing advanced programming techniques and theory. Topics include graphics, sorting, accessing database files, object linking and embedding, dynamic link libraries, and dynamic lists. Prerequisite: CSS 211.

- 231      Programming in C++ (4)  
 An extensive study of object-oriented programming using the C++ language. In addition to fundamentals of programming in C++, topics include pointers, linked lists, classes and data abstraction, and recursion. Prerequisites: CSS 212 or equivalent. Alternate years.
- 235      Programming in Java (4)  
 An extensive study of object-oriented programming using the Java language. In addition to the fundamentals of Java, topics include programming for the web, designing user interfaces, and client/server programming.
- 251      Introduction to COBOL Programming (4)  
 A first course in computer programming using the COBOL language. In addition to designing, coding, and debugging programs, topics include loops, branches, lists, sorts, searches, and structured programming. Prerequisite: MTH 103 or equivalent. Alternate years.
- 271      Topics in Operating Systems (3)  
 Installation, use, and structure of modern operating systems. Operating systems covered include operating systems in the Windows and UNIX families. Topics include kernel structure, driver structure, command line interfaces, memory management, file systems, and virtual machines. Prerequisites: CSS 211 or higher.
- 305      Concepts of Information Systems (3)  
 A course designed to cover the basics of computer information systems, including transaction processing, decision support, and management information systems. Other topics include hardware and data storage options, software applications, databases, user support, networks and the Internet, security, the systems development life cycle, and social and ethical issues in the computer industry. Prerequisites: CSS 113, 211.
- 333      Data Structures (3)  
 A study of advanced concepts in the area of data structures. Topics include trees, lists, files, stacks, queues, heaps, program correctness, complexity analysis, and algorithmic design. Prerequisite: CSS 231 or equivalent. Alternate years.
- 351      System Administration (3)  
 Maintenance, setup, and troubleshooting issues for servers and networks. Server operating systems will include Windows and UNIX families. Topics include file services, web services, print services, database services, and client setup. Prerequisite: CSS 211 or higher.
- 361, 362 Topics in Computer Science I, II (3,3)  
 An advanced study of selected topics in computer science such as operating systems, information systems, data base management systems, algorithms, systems design, artificial intelligence, networks and communications, and digital electronics. Prerequisite: CSS 212 or 251. Alternate years.
- 372      Networks and Internets (3)  
 A study of physical and logical aspects of local and wide area networks. Topics include the OSI model, network topologies, communication protocols, media, hardware, and issues of network administration. Prerequisites: CSS 212 or equivalent. Alternate years.
- 375      Principles of Databases (3)  
 A study of the design of databases, focusing on relational database design. Topics include data modeling, normalization, queries, SQL syntax, constraints, security and recovery, and large-scale databases. Hierarchical, Network, and Object-Oriented designs are also introduced. Prerequisite: CSS 113 or 211.

- 381 Architecture and Assembly Language (3)  
An introduction to programming in assembler and machine language. Topics include register manipulations, addressing techniques, interrupt routines, string processing, binary arithmetic, bit manipulations, and internal data storage such as hexadecimal and two's complement. Prerequisites: CSS 212 or 231. Alternate years.
- 401 Project in Computer Science (1)  
A capstone experience for students to tie together topics that extend across courses. The student will prepare a paper and an oral presentation. Topics that may be pursued include topics in the history of computing, societal effects of information technology, and the writing of user manuals for software. This course is designed for students to work independently. Prerequisite: Senior status.
- 411 Modeling and Simulation (3)  
A capstone course in modeling and simulation using previously studied languages and including at least one major programming project. Topics include a survey of simulations, iterated function systems, cellular automata, predator-prey models, random number generation, and random distributions and applications. Prerequisites: CSS 212 or 231; MTH 301 or consent of instructor. Alternate years.
- 445 Internship (1-6)  
A supervised work experience that requires the student to apply computer skills in a professional environment. For each credit hour earned, the student spends a minimum of 30 hours of approved work experience with a cooperating organization. Graded on a Pass/Fail basis only. Prerequisite: Permission of instructor and a 2.0 cumulative grade point average.