AIMS OF THE PROGRAM

The primary mission of the Department of Computer Science is to prepare students for professional work in the field of computer science, within a Christian context. A secondary mission of the Department is to provide service courses in computer science to the University community at-large.

The Department of Computer Science offers two bachelor of science degree programs. The first, the Bachelor of Science in Computer Science, is intended for students who wish to pursue careers in computer science, either in industry or in academia. The second program, offered in collaboration with the Department of Business Administration, is a double major leading to a Bachelor of Science in Business Administration and Computer Information Systems. This program is intended for students who wish to apply the tools of computer science in a management context.

In addition to the above programs, the Department offers a minor in Computer Science.

Computer Science, B.S.

CSIS 110, 111 Principles of Computer Programming I, II ............... 6
CSIS 125 Discrete Structures I ................................................ 3
CSIS 211 Data Structures & Algorithms .................................. 3
CSIS 215 Object-Oriented Programming in C++ ........................ 3
CSIS 225 Discrete Structures II ........................................... 3
CSIS 245 Introduction to LAN Technology ............................... 4
CSIS 310 Assembler Programming & Machine Organization ........... 3
CSIS 315 Application Development for Event-Driven GUI Applications .................................................. 3
CSIS 360 Operating Systems .................................................. 3
CSIS 405 Formal Languages and Automata ................................ 3
CSIS 445 Internetwork Architectures ..................................... 3
CSIS 450 Principles of Database Design .................................. 3
CSIS 490 Software Engineering ............................................ 3
PHYS 305 Digital Electronics ............................................... 4
C.S. Electives (upper division) ............................................ 6
TOTAL 53

Required Cognates:

PHYS 121 General Physics I ................................................ 4
PHYS 122 General Physics II .............................................. 4
MATH 121 Precalculus .................................................... 3
MATH 181 Calculus I ....................................................... 4
MATH 241 Intro to Probability & Statistics ............................ 3
COMM 115 Discussion Techniques .................................... 2
TOTAL 21

General Education and Elective Courses: 54
GRAND TOTAL 128

The Bachelor of Science in Computer Science is a composite major. It therefore does not require a minor.

We strongly suggest that students seeking a Bachelor of Science in Computer Science plan to take their major courses in the following sequence:

Freshman - Fall Semester CSIS 110
Spring Semester CSIS 111, CSIS 125

Sophomore - Fall Semester CSIS 211, CSIS 225
Spring Semester CSIS 215, CSIS 245

Junior - Fall Semester CSIS 310, PHYS 305, CSIS upper div. elec.
Spring Semester CSIS 315, CSIS 360

Senior - Fall Semester CSIS 405, CSIS 445, CSIS 450
Spring Semester CSIS 490, CSIS upper division elective

All students pursuing majors or minors in this department should plan on enrolling in MATH 110 no later than the spring semester of their Freshman year.

Double Major in Business Administration and Computer Information Systems, B.S.

This program is open only to students seeking a double major in Business Administration and Computer Information Systems. Students who wish to pursue this program must make formal application both to the Department of Business Administration and the Department of Computer Science.

Business Administration Courses:

ACCT 211, 212 Accounting Principles I, II ...................................... 8
BUAD 211 Profiles of Entrepreneurship .................................. 3
BUAD 301 Principles of Management .................................... 3
BUAD 311, 312 Business Law I, II ........................................... 6
BUAD 321 Business Finance .................................................. 3
BUAD 350 Business Ethics and Social Responsibility ................ 3
BUAD 496 Senior Business Seminar ....................................... 1
ECON 211 Macroeconomics .................................................. 3
MKTG 343 Principles of Marketing ........................................ 3
MKTG 402 E-Commerce Environment ..................................... 3
TOTAL 36

Computer Information Systems Courses:

CSIS 110, 111 Principles of Computer Programming I, II ............... 6
CSIS 125 Discrete Structures I ........................................... 3
CSIS 211 Data Structures & Algorithms ................................ 3
CSIS 215 Object-Oriented Programming in C++ ....................... 3
CSIS 245 Introduction to LAN Technology ............................. 4
CSIS 303 E-Commerce and Web Site Design .................................. 3
CSIS 310 Assembler Programming & Machine Organization ........ 3
CSIS 315 Application Development for Event-Driven GUI Applications .................................................. 3
CSIS 360 Operating Systems ................................................. 3
CSIS 445 Internetwork Architectures ..................................... 3
CSIS 450 Principles of Database Design .................................. 3
CSIS 490 Software Engineering ............................................ 2
TOTAL 40

Required Cognates:

MATH 241* Statistics ....................................................... 3
MATH 236* Applied Mathematics for Business .......................... 3
COMM 115 Discussion Techniques .................................... 3
TOTAL 9

*MATH 110 is a prerequisite for these classes.

General Education and Elective Courses: 43-46
GRAND TOTAL 128-131

57
# Computer Science

## Computer Science Minor

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSIS 110, 111</td>
<td>Principles of Computer Programming I, II</td>
<td>6</td>
</tr>
<tr>
<td>CSIS 125</td>
<td>Discrete Structures I</td>
<td>3</td>
</tr>
<tr>
<td>CSIS 211</td>
<td>Data Structures &amp; Algorithms</td>
<td>3</td>
</tr>
<tr>
<td>CSIS 215</td>
<td>Object-Oriented Programming in C++</td>
<td>3</td>
</tr>
<tr>
<td>CSIS 245</td>
<td>Introduction to LAN Technology</td>
<td>4</td>
</tr>
<tr>
<td>CSIS 315</td>
<td>Application Development for Event-Driven</td>
<td>3</td>
</tr>
<tr>
<td>CSIS 445</td>
<td>Internetwork Architectures</td>
<td>3</td>
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</tbody>
</table>

**TOTAL:** 25 hours

## COURSES

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CSIS 102</td>
<td>Microcomputer Literacy and Applications</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Prerequisite:</strong> OFIS 100 or equivalent</td>
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<tr>
<td></td>
<td>An introduction to the use of microcomputers, oriented toward future microcomputer users, not computer specialists. Topics include history of the field, computer hardware, software, operating systems, the Internet, and information systems. Students will work with popular applications for business and personal use, including web browsers, word processors, spreadsheets, and databases. (Fall, Spring)</td>
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<tr>
<td>CSIS 105</td>
<td>Introduction to Computing</td>
<td>3</td>
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<td></td>
<td><strong>Prerequisite:</strong> CSIS 102</td>
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<td></td>
<td>An overview of computing as a human activity emphasizing the use of computers as tools to meet the needs of individuals and groups. Topics for study and discussion will include the history and development of computers, the impact of computers on the quality of life, information processing using computers, and ethical issues with respect to the use of information. Students will be introduced to the use of the Internet. (Fall, Spring)</td>
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<tr>
<td>CSIS 110</td>
<td>Principles of Computer Programming I</td>
<td>3</td>
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<tr>
<td></td>
<td><strong>Prerequisite:</strong> CSIS 110</td>
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<tr>
<td></td>
<td>A continuation of CSIS 110 with emphasis on elementary data structures and advanced techniques. Students will be introduced to C++. (Spring)</td>
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<tr>
<td>CSIS 125</td>
<td>Discrete Structures I</td>
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<tr>
<td></td>
<td><strong>Prerequisite:</strong> MAP score of 49, or Corequisite: MATH 110</td>
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<td></td>
<td>An introduction to the basics of discrete mathematics as applied in computer science. Topics include elementary logic, propositional logic, predicate logic, proof techniques, sets, relations, functions, counting, elementary number theory, and Boolean algebra. (Spring)</td>
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</tbody>
</table>

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>CSIS 211</td>
<td>Data Structures and Algorithms</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Prerequisite:</strong> CSIS 111, CSIS 125</td>
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<tr>
<td></td>
<td>A continuation of CSIS 111’s study of data structures, and a study of the time-complexity of algorithms. There will be an emphasis on choosing the appropriate storage arrangement and the appropriate algorithms to manipulate data, both in high-speed memory, on mass storage devices, or using a combination of the two. (Fall)</td>
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<tr>
<td>CSIS 215</td>
<td>Object-Oriented Programming in C++</td>
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<td></td>
<td><strong>Prerequisite:</strong> CSIS 211 or Instructor's approval</td>
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<td>A development of a strategic object-oriented approach to problem solving — analysis, design and coding — using the C++ language. There will be a focus on the use of classes to implement abstract data types, thus supporting the modern approach to loosely linked, modular code. The overloading of functions and operators, inheritance, and polymorphism will be studied as abstraction tools. (Spring)</td>
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<tr>
<td>CSIS 225</td>
<td>Discrete Structures II</td>
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<td><strong>Prerequisites:</strong> CSIS 125</td>
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<td></td>
<td>A continuation of the study of discrete structures begun in CSIS 125. Topics include recurrence relations, graphs and trees, matrices, discrete probability, computational complexity, and elementary computability. (Fall)</td>
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<tr>
<td>CSIS 245</td>
<td>Introduction to Local Area Network Technology</td>
<td>4</td>
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<td></td>
<td><strong>Prerequisite:</strong> CSIS 111, CSIS 125</td>
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<tr>
<td></td>
<td>A practical introduction to current LAN network technologies, with emphasis on Ethernet. Topics include: signal encoding, channel access/utilization, integration/configuration/operation of hardware, cabling protocols, and LAN operating systems. (Spring)</td>
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<tr>
<td>CSIS 291</td>
<td>Selected Topics</td>
<td>1-3</td>
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<td></td>
<td><strong>Prerequisite:</strong> Permission of Department Chair</td>
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<td></td>
<td>Designed for the student who wishes to do independent study or research. Content and method of study must be arranged prior to registration. May be repeated for a total of 6 credits.</td>
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<tr>
<td>CSIS 301</td>
<td>Issues and Practices in Information Security</td>
<td>3</td>
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<td><strong>Prerequisite:</strong> CSIS 105 or permission of Instructor</td>
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<tr>
<td></td>
<td>An examination of the issues to be considered and practices typically employed when implementing security measures to protect computing resources and data. Topics to be considered include basics of computing and networking, as well as securing communications channels, computer systems, and information resources. (Spring)</td>
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<tr>
<td>CSIS 303</td>
<td>E-Commerce &amp; Web Site Design</td>
<td>3</td>
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<tr>
<td></td>
<td><strong>Prerequisite:</strong> CSIS 105 or permission of Instructor</td>
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<tr>
<td></td>
<td>An examination of the ground rules for competitive survival in the new market space of electronic commerce, including the electronic channels of well-designed Web sites and their impact on small and large business entities. Emphasis will be placed on analyzing information and applying design techniques to develop effective Web pages for on-line business. Topics include e-commerce, navigation, security issues, networks, business models, and an overview of Web design and development tools. (Also taught as MKTG 303.) (Fall)</td>
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</tbody>
</table>
Computer Science

CSIS 310 Assembler Programming and Machine Organization 3 hours
Prerequisites: CSIS 215
An introduction to assembler language programming and computer organization and architecture. (Fall)

CSIS 315 Application Development for Event-Driven GUI Applications 3 hours
Prerequisites: CSIS 215
An introduction to the event-driven programming model using a windowed graphical user interface. Emphasis will be on using available tools and libraries to speed the development of significant applications. (Spring)

CSIS 360 Operating Systems 3 hours
Prerequisites: CSIS 310
A study of operating system organization, job control, I/O, and resource management. Emphasis will be placed on features of the UNIX O/S. (Spring)

CSIS 370 Programming Languages 3 hours
Prerequisite: CSIS 215.
Comparative study of programming languages with emphasis on formal language specification and analysis, run-time behavior, and implementation. (Fall)

CSIS 405 Formal Languages and Automata 3 hours
Prerequisite: CSIS 205.
An introduction to formal language theory, with emphasis on regular and context-free grammars. Topics include: language properties, the Chomsky Hierarchy, Finite State Machines, uncomputability, and computational complexity. (Fall)

CSIS 445 Internetwork Architectures 3 hours
Prerequisite: CSIS 245, 360.
An in-depth study of internetwork architectures. Topics include: protocols, switching, WAN routing, interconnectivity, virtual circuits, Client/Server based distributed applications, and distributed processing. (Fall)

CSIS 450 Principles of Database Design 3 hours
Prerequisite: CSIS 320.
Course covers design and implementation of databases with emphasis on structures and schemas, information retrieval, SQL, security, and integrity. (Fall)

CSIS 490 Software Engineering 3 hours
Prerequisite: CSIS 315
A study of the management and implementation of programming projects. Topics include project management, scheduling and control, programming assignments and specifications, testing and documentation, system implementation, and evaluation. Students will be required to complete a significant team project involving both design and implementation. This course meets the upper division writing component for senior year English. (Spring)

CSIS 491 Selected Topics 1-3 hours
Prerequisite: Approval by Department Chair
Designed for the student who wishes to do independent study or research. Content and method of study must be arranged prior to registration. May be repeated for a total of 6 credits.

CSIS 492 Computer Science Internship 1-3 hours
Prerequisite: Approval by Department Chair
On-the-job supervised experience in a field of computer science related to the student's concentration area. Limited to senior majors. May be repeated for a total of 6 credits.

CSIS 495 Special Topics Seminar 1-3 hours
Prerequisite: Approval by Department Chair
Covers topics of special interest such as new developments in the field of computer science, as well as occasional specialized topics such as artificial intelligence, computer graphics, etc. May be repeated for a total of 6 credits.