

Computer Science (B.S.)

Program Description

The computer field is growing rapidly and has had a profound impact on almost every facet of our lives. Students in this field prepare for the world of the future. The computer science program at Webster offers a unique blend of theory and practice, with many classes taught by professionals in the field. Small classes provide personalized attention for each student. The computer labs allow students to gain hands-on experience, usually providing a computer for each student.

Locations

To learn where the B.S. in computer science is offered, please visit our Web site at www.webster.edu/ugcatalog/math.html

Computer Science (without an Emphasis)

Program Curriculum

36 required credit hours
27 general education credit hours
65 elective credit hours

At least 18 of the required 36 computer science credit hours must be taken at Webster University. Computer applications courses are not applicable toward the major.

Required Courses

COSC 1540 Introduction to Information Processing	3 hours
COSC 1550 Computer Programming I	3 hours
COSC 1560 Computer Programming II	3 hours
COSC 1570 Mathematics for Computer Science	3 hours
COSC 2250 Data Structures I	3 hours
COSC 2610 Operating Systems	3 hours
COSC 2810 Systems Analysis and Design	3 hours
COSC 3100 Data Structures II	3 hours

Computer science courses numbered 3000 or above, excluding COSC 3900 Practicum and COSC 3910 Project 12 hours

Computer Science (with an Emphasis in Information Management)

Degree Requirements

51 required credit hours
12 general education credit hour
65 elective credit hours

At least 18 of the required 36 computer science credit hours must be taken at Webster University.

Required Courses

COSC 1540 Introduction to Information Processing	3 hours
COSC 1550, 1560 Computer Programming I, II	6 hours
COSC 1570 Mathematics for Computer Science	3 hours
COSC 2250 Data Structures I	3 hours
COSC 2610 Operating Systems	3 hours
COSC 2810 Systems Analysis and Design	3 hours
COSC 3100 Data Structures II	3 hours
COSC 4110 Database Concepts	3 hours
COSC 4120 Database Applications	3 hours
COSC 4810, 4820 Information Systems I, II	6 hours

Students who do not have a second major or a minor in business or management are required to take the following courses:

ACCT 2010 Financial Accounting	3 hours
ACCT 2025 Managerial Accounting	3 hours
MNGT 2100 Management Theory and Practices	3 hours

Any two of the following courses:
BUSN 2750 Introduction to Statistics 3 hours
ECON 2010 Principles of Macroeconomics 3 hours
ECON 2020 Principles of Microeconomics 3 hours
FINC 3210 Principles of Finance 3 hours

Course Descriptions

COSC 1540 Introduction to Information Processing (3)

Covers the general concepts and vocabulary of information processing, including its history, the hardware and software requirements for the processing cycle, and career opportunities.

COSC 1550 Computer Programming I (3)

Introduces students to the C++ language in order to teach programming as a systematic discipline and as a problem-solving tool. Acquaints students with fundamental concepts of computers, information processing, algorithms, and programs. May be repeated once for credit. Only offered in a 16-week format.

COSC 1560 Computer Programming II (3)

This course uses the C++ language to introduce students to programming concepts such as abstract data types, use of classes and objects, pointers, and advanced file operations. Prerequisite: COSC 1550 with grade of B or better. May be repeated once for credit. Only offered in 16-week format.

COSC 1570 Mathematics for Computer Science (3)

Topics covered include number systems, computer arithmetic, binary, octal, hexadecimal, floating point operations, sets, and Boolean algebra.

COSC 2250 Data Structures I (3)

Studies the design and implementation of the most common algorithms associated with the basic data types and with some elementary data structures using C++. The relationship of algorithm design to problem solving in general is studied. The course also covers algorithms to improve the robustness and user friendliness of programs. Prerequisite: COSC 1560.

COSC 2610 Operating Systems (3)

An overview of the concepts and theories of operating systems. Examines the major components found in all operating systems including the memory, process manager, and device and file managers. Prerequisite: COSC 1550.

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COSC 2810 Systems Analysis and Design (3)

Covers the basic concepts involved in systems analysis, including effective communication, analysis tools, and phases of the systems development life cycle. Prerequisite: COSC 1540.

COSC 3100 Data Structures II (3)

This is a continuation of COSC 2250 Data Structures I. Students will program the data structures and algorithms using C++. Prerequisites: COSC 2250, COSC 1570, and 64 credit hours completed.

COSC 3200 Advanced Programming Techniques (3)

Study of advanced programming techniques in C++ beyond those covered in COSC 3100 Data Structures II. Prerequisites: COSC 3100 and permission of the department.

COSC 3410 Computer Security (3) Students in this course will study the techniques for protecting data within a computer and protecting data as it moves through a network. Data and system security and reliability will be considered in a distributed environment. Topics will include encryption, authentication and digital signatures, threats to the computer system, and system reliability. Prerequisite: COSC 3100.

COSC 3510 Computer Architecture (3)

Studies the design of microcomputer systems: transistors, logic gates, chips, and digital circuits. Prerequisites: COSC 1570, COSC 2610, and COSC 3100.

COSC 3610 Operating Systems Concepts (3)

Considers such topics as system performance, I/O support, and supervisory functions. Prerequisites: COSC 2610 and COSC 3100.

COSC 3660 Network Concepts (3)

Explores the basic concepts of computer networks. Course examines and compares network topologies, protocols, and national and international standards. It examines the similarities and differences in local area networks and wide area networks. Prerequisites: COSC 2660 and COSC 3100.

COSC 3810 Principles of Programming Languages (3)

This course is a study of the design, evaluation, and implementation of programming languages. It focuses on the principles of design and evaluation and their relationship to the syntax, semantics, and pragmatics of programming languages. Prerequisite: COSC 3100.

COSC 3900 Practicum (1-12)

(Note: This course does not count toward a computer science major without an emphasis or toward a minor.) Prerequisites: COSC 3100 and permission of the department. May be repeated for credit up to a maximum of 24 credits.

COSC 3910 Project (1-8)

(Note: This course does not count toward a computer science major without an emphasis or toward a minor.) Prerequisites: COSC 3100 and permission of the department.

COSC 4110 Database Concepts (3)

Examines different database models with consideration of the selection criteria, database organization, and query languages. Students learn the logical design process used in creating a database, including table normalization. Prerequisite: COSC 3100.

COSC 4120 Database Applications (3)

Continuation of COSC 4110. Students develop the logical design from COSC 4110 into a complete computer application with documentation. Focuses on specific applications that are important in a variety of computer information systems. Applications are examined from the perspective of user needs and program design. Students study program design using a database management system. Prerequisite: COSC 4110.

COSC 4250 Object-Oriented Analysis and Design (3)

Designed to teach the student the fundamentals of object-oriented software analysis and design. Presents the theoretical aspects of object-oriented software design but focuses on the practical issues surrounding object-oriented software analysis and design and the format of the design process as it exists in an industrial setting. The student gains experience in the design aspect of the systems development life cycle. Prerequisite: COSC 3100.

COSC 4260 Object-Oriented Programming (3)

Continuation of COSC 4250 using C++. Prerequisite: COSC 4250.

COSC 4810 Information Systems I (3)

Using systems analysis and design techniques, students look at the software and hardware requirements needed to create an information system. Prerequisites: COSC 2810 and COSC 3100.

COSC 4820 Information Systems II (3)

Continuation of Information Systems I, with emphasis on solving an organization's information system problems. This course provides the opportunity to apply the theory in a substantial project. Prerequisite: COSC 4810.

COSC 4910 Senior Overview (3)

Prerequisites: COSC 3100 and permission of the department.