

COMPUTER SCIENCE

Courses offered by the Computer Science Department are interactive, featuring hands-on experience with contemporary computer hardware and software. The courses cover a range of computing topics with an emphasis on software development and fundamental computer science concepts. The Computer Science curriculum may culminate in either an Associate of Science degree or a certificate. The degree program prepares students to transfer to a four-year institution with a major in computer science or a related discipline. Students planning to transfer to a four-year institution and major in computer science should consult with a counselor regarding the transfer process and lower division requirements.

Contact Information

Division: Mathematics, Business, and Computer Technology (B - 127)

Division Phone Number: (909) 384-8520

Department Chair: Reginald Metu (rmetu@sbccd.edu), Ed.D.

Counselor Liaisons: Deana Kelly-Silagy (dsilagy@sbccd.edu), M.A. and Armando Garcia (argarcia@sbccd.edu), M.S.C.

- Computer Science Associate in Science for Transfer Degree (<http://catalog.valleycollege.edu/degree-certificate-program-index/computer-science/computer-science-as-t-degree/>)
- Computer Science Associate of Science Degree (<http://catalog.valleycollege.edu/degree-certificate-program-index/computer-science/computer-science-as-degree/>)
- Computer Science Certificate of Achievement (<http://catalog.valleycollege.edu/degree-certificate-program-index/computer-science/computer-science-certificate-achievement/>)

CS 074 3 Units

iOS App Development

Lecture: 18 contact hours

Lab: 108 contact hours

This course will cover the fundamentals of iPhone application development using the Objective-C, Swift, and the iPhone SDK (Software Development Kit). The theory and use of using and managing Xcode, 3D Game Development, Storyboard Builder, Audio /Animation /Data /Location, User Interface (UI) development, game and app design will be covered. Students will gain valuable experience using front end and back end development tools to complete production ready iPhone applications.

Associate Degree Applicable

CS 075 3 Units

Introduction to Web Development

Lecture: 18 contact hours

Lab: 108 contact hours

This course focuses on web development and addresses the essentials for skilled web developers who can create digital media, web, and mobile applications for modern desktop and portable devices. Students in this program are offered an in-depth, project-driven curriculum that provides a comprehensive study of HTML, CSS, JavaScript, Web Animation, Multimedia Creation. Students will learn to develop visually aesthetic, user friendly, and interactive web-based applications. Students will also gain valuable experience using front end and backend development tools like Adobe Dreamweaver, Adobe Animate, and Visual Studio. Students will also be exposed to the programming languages that cross over from web development to mobile device development. The synergy between the many web and mobile technologies will help each student build a foundation suitable for professional content.

Associate Degree Applicable

CS 076 3 Units

Android App Development

Lecture: 18 contact hours

Lab: 108 contact hours

This course will cover Android Developer Fundamentals and basic Android programming concepts and build a variety of apps, starting with Hello World and working their way up to apps for business solutions and game development. Creating assets for applications and utilities is also covered.

Associate Degree Applicable

CS 077 4 Units

Introduction to C-Sharp

Lecture: 54 contact hours

Lab: 54 contact hours

Advisory: Eligibility for college level Mathematics based on the SBVC Guided-Self Placement process.

This course is an introduction to C# (C Sharp) app development. C# is a sophisticated and type-safe object-oriented language that empowers developers to build a variety of secure and robust applications that run on the .NET Framework. Topics will include fundamental object-oriented programming concepts like loops, arrays, logic, debugging, database, using the C# languages in a game development environment, files, and game development.

Associate Degree Applicable

CS 098 1-4 Units

Computer Science Work Experience

WRKEX: 300 contact hours

Supervised training, in the form of on the job employment that will enhance the student's knowledge in the selected field of study. The student's major and job must match. For paid work, 75 hours = 1 unit; for volunteer work, 60 hours = 1 unit. Students may earn a total of 16 units toward graduation in Work Experience 098 courses. See department for specific guidelines.

Associate Degree Applicable

CS 100 4 Units**Advanced C-Sharp Programming****Lecture:** 54 contact hours**Lab:** 54 contact hours

This course is the advanced C-Sharp course designed to further the learner's C-Sharp and programming knowledge beyond the Introductory level. Advanced programming using C-Sharp .NET is designed to emphasize software development, whether it is part of game development, web technologies, cloud computing technologies, Internet of Things (IoT), educational solutions, and innovative, original ideas conceived in the process of learning. Topics include object-oriented design, class(object) development, interfaces, design patterns, database access, and utilities.

Associate Degree Applicable**Transfers to both UC/CSU****CS 102 3 Units****Introduction to Python Programming****Lecture:** 36 contact hours**Lab:** 54 contact hours**Advisory:** MATH 102 or MATH 108 or MATH 115

This course will cover the most common Python libraries as well as teach you programming best practices. We will explore different aspects of Python, including web, utility applications, machine learning, computer vision, IoT (Internet of Things), and data modeling applications. By the completion of the course, learners will complete a project using Python related to their major or area of interest.

Associate Degree Applicable**Transfers to both UC/CSU****CS 110 3 Units****Fundamentals of Computer Science****Lecture:** 36 contact hours**Lab:** 54 contact hours**Prerequisite:** Eligibility for college level English and Mathematics based on the SBVC Guided-Self Placement process.

This course is an overview of the computer science discipline investigating the design and use of the computer devices, the art and science of problem solving and programming, the representation of data, human-computer interactions and ethical considerations, and information security principles. Also included is hands-on experience with command line and GUI operating systems; application of HTML, CSS, and scripts to web pages; and computer programming with an object-oriented language such as C++, Java, or C#.

Associate Degree Applicable**Transfers to both UC/CSU****C-ID:** COMP 122**CS 120 4 Units****Introduction to Visual Basic.NET****Lecture:** 54 contact hours**Lab:** 54 contact hours**Advisory:** Eligibility for college level Mathematics based on the SBVC Guided-Self Placement process.

This is an introduction to the Visual Basic.NET programming language. Topics include problem solving, graphical user interface, program design, software tools, structured logic, object-oriented programming, graphics and animation, procedures, arrays, files, and programming projects.

Associate Degree Applicable**Transfers to both UC/CSU****CS 130 3 Units****Discrete Structures****Lecture:** 54 contact hours**Prerequisite:** CS 110 and MATH 102

This course surveys discrete structures used in computer science with an emphasis on applications. Topics covered include: functions, relations, and sets; basic logic; proof techniques; basics of counting; graphs and trees; and discrete probability.

Associate Degree Applicable**Transfers to both UC/CSU****C-ID:** COMP 152**CS 150 4 Units****Web Programming with PHP****Lecture:** 54 contact hours**Lab:** 54 contact hours

This course uses PHP (PHP: Hypertext Preprocessor) for programming introduction; as well as web server-side programming for web apps of dynamic websites and web services. It also introduces database-driven web infrastructure, using PHP to access database server and content management system for a full-fledged web app. Topics include PHP fundamentals, function, array, string, object-oriented paradigm, data store (database management system) introduction, content management system (CMS) introduction, PHP with data store, PHP with CMS, LAMP/WAMP stack introduction. Although not required, but some coding knowledge and experience in high-level programming language (such as C++) is strongly advised.

Associate Degree Applicable**Transfers to CSU only****CS 170 4 Units****Assembly Language****Lecture:** 54 contact hours**Lab:** 54 contact hours**Prerequisite:** CS 110

This course focuses on the organization and behavior of computer systems at the assembly-language level. The mapping of high-level language statements and constructs to machine-level instructions and internal representation of common data types and simple structures is studied including the methods of numerical computation with assembly language constructs emphasizing common pitfalls associated with data representation and procedural errors encountered during the creation of machine language routines. This course includes hands on experience creating assembly language programs.

Associate Degree Applicable**Transfers to both UC/CSU****C-ID:** COMP 142

CS 190 4 Units**Programming in C++****Lecture:** 54 contact hours**Lab:** 54 contact hours**Prerequisite:** CS 110 and Eligibility for college level English based on the SBVC Guided-Self Placement process.

This course is an examination of intermediate object-oriented programming concepts and their application using the C++ language. Topics include programming control mechanisms; algorithm development; analysis of iterative and recursive solution complexity for various algorithms; templates and data structures; exception handling; object-oriented design and modeling; object-oriented programming in software engineering; pointers architecture.

Associate Degree Applicable**Transfers to both UC/CSU****C-ID:** COMP 122**CS 215 4 Units****Programming with Java****Lecture:** 54 contact hours**Lab:** 54 contact hours**Prerequisite:** CS 110

An introduction to Java. Topics include object-oriented design, multiple platform environment, program logic structures, graphical user interface, Java Applet, and recursion.

Associate Degree Applicable**Transfers to both UC/CSU****CS 220 4 Units****Advanced Visual Basic.Net Programming****Lecture:** 54 contact hours**Lab:** 54 contact hours**Prerequisite:** CS 120

This course covers advanced programming using Visual Basic .NET with an emphasis on software development and maintenance. Topics include object-oriented design, multiple class modules, interface and linking, windows and Internet controls, and database access.

Associate Degree Applicable**Transfers to both UC/CSU****CS 222 1-3 Units****Special Problems in Computer Science I****DIR:** 54 contact hours**Prerequisite:** CS 110

Assigned problems involving computer laboratory work for selected students who are interested in furthering their knowledge of computer science on an independent study basis. Students are required to devote three contact hours per week to their project throughout the semester. Prior to registration, a contract must be prepared. See Instructor for details.

Associate Degree Applicable**Transfers to CSU only****CS 265 3 Units****Data Structures and Algorithms with C++****Lecture:** 36 contact hours**Lab:** 54 contact hours**Prerequisite:** CS 130 and CS 190 and MATH 250**Corequisite:** CS 130 and MATH 250

This course is an introduction to algorithmic analysis and data structures. Topics include formal computing algorithms, algorithmic strategies, and basic algorithm analysis; canonical data structures; intermediate recursion; human-computer interaction; professionalism and ethical behavior; software information assurance, software engineering, and software reuse.

Associate Degree Applicable**Transfers to both UC/CSU****C-ID:** COMP 132