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# COMPUTER SCIENCE

## CS V04 - INTRODUCTION TO COMPUTERS AND COMPUTER LITERACY - 3 Units

Hours: 2.5 lecture, 1.5 laboratory weekly

This course introduces the student to the fundamental concepts of computers and computer literacy. Topics include information technology, operating systems, applications software, hardware components, input, output, storage, graphics, hypertext, multimedia, networking, computer communications, the Internet, Web page features, computer security, privacy and computer communications, systems analysis, systems design, programming languages, programming methods, management information systems, and the ACM Code of Ethics and Professional Conduct. This course also offers the student an introduction to the historical and social context of computing, including an overview of computer and information sciences as a discipline.

Fees will be required. Field trips may be required. Transfer credit: CSU; UC; credit limitations - see counselor.

## CS V11 - PROGRAMMING FUNDAMENTALS - 3 Units

Recommended preparation: CS V04 or equivalent; and MATH V03 or 1 year of high school intermediate algebra (Algebra II) with grade of C or better

Hours: 2.5 lecture, 1.5 laboratory weekly

This course introduces the student to fundamental concepts of procedural programming. Topics include data types, control structures, functions, arrays, files, and the mechanics of running, testing, and debugging. The course emphasizes good software engineering principles and developing fundamental programming skills in the context of a functional programming language.

Fees will be required. Field trips may be required. Transfer credit: CSU; UC; credit limitations - see counselor.

## CS V13 - OBJECT-ORIENTED PROGRAMMING - 3 Units

Prerequisites: CS V11 or equivalent; and MATH V03 or 1 year of high school intermediate algebra (Algebra II) with grade of C or better

Hours: 2.5 lecture, 1.5 laboratory weekly

This course introduces the concepts of object-oriented programming to students with background in the procedural paradigm. The course begins with a review of control structures and data types with emphasis on structured data types and array processing. It then moves on to introduce the object-oriented programming paradigm, focusing on the definition and use of classes along with the fundamentals of object-oriented design. Other topics include an overview of programming language principles, simple analysis of algorithms, basic searching and sorting techniques, and an introduction to software engineering issues.

Fees will be required. Field trips may be required. Transfer credit: CSU.

## CS V15 - DATA STRUCTURES AND ALGORITHMS - 3 Units

Prerequisites: CS V13 or equivalent; and MATH V20 or both MATH V04 and MATH V05

Hours: 2.5 lecture, 1.5 laboratory weekly

This course builds on the foundation provided by the programming fundamentals/object-oriented programming sequence to introduce the fundamental concepts of data structures and algorithms that proceed from them. Topics include recursion, the underlying philosophy of object-oriented programming, fundamental data structures (including stacks, queues, linked lists, hash tables, trees, and graphs), the basics of algorithmic analysis, and an introduction to the principles of language translation.

Fees will be required. Field trips may be required. Transfer credit: CSU.



## CS V17 - DISCRETE STRUCTURES - 3 Units

Prerequisite: MATH V20 or both MATH V04 and MATH V05

Recommended preparation: CS V11 or equivalent

Hours: 3 lecture weekly

This course introduces the student to discrete mathematics as it is used in computer science. Topics include functions, relations, sets, propositional and predicate logic, simple circuit logic, proof techniques, elementary combinatorics, and discrete probability.

Field trips may be required. Same as MATH V52. Transfer credit: CSU; UC; credit limitations - see counselor.

**CS V10 - COMPUTER ARCHITECTURE AND ORGANIZATION - 3 Units**

Prerequisite: CS V15 or equivalent; and CS V17 or equivalent

Hours: 2.5 lecture, 1.5 laboratory weekly

This course introduces students to the organization and architecture of computer systems, beginning with the standard von Neumann model and then moving forward to more recent architectural concepts. This course also offers the students an introduction to assembly language and low-level programming of system software and computer applications.

Fees will be required. Field trips may be required. Transfer credit: CSU; UC.

**CS V20 - BEGINNING VISUAL BASIC - 3 Units**

Prerequisite: CS V04 or equivalent; and MATH V03 or 1 year of high school intermediate algebra (Algebra II) with grade of C or better

Recommended preparation: CS V11 or equivalent

Hours: 2.5 lecture, 1.5 laboratory weekly

This course introduces the student to the concepts of event-driven programming. This course presents the knowledge, skills and techniques to build Visual Basic programs. Topics include the programming design process, visual console procedures, an overview of computer hardware organization, data representation, instruction forms, flowcharting problems, logic solutions, and algorithms for problem solution. Concepts and definitions include: labels, variables, subscripts, data structures, object-oriented design, OLE, API, Windows forms, and scientific notation. Also included are debugging Visual Basic statements and elementary coding.

Fees will be required. Field trips may be required. Transfer credit: CSU; UC; credit limitations - see counselor.

**CS V22 - INTERMEDIATE VISUAL BASIC - 3 Units**

Prerequisite: CS V11 or CS V20 or equivalent

Recommended preparation: MATH V03 or equivalent

Hours: 2.5 lecture, 1.5 laboratory weekly

This intermediate-level course presents to students the concepts of developing Microsoft Windows applications with Visual Basic. Topics include: Multiple Document Interface (MDI), graphics, custom controls, Dynamic Link Libraries (DLLs), Object Linking and Embedding (OLE), advanced database access, and the Windows API. Emphasis is placed on developing more advanced programming techniques using programming standards, application integration, and rapid development.

Fees will be required. Field trips may be required. Transfer credit: CSU.

**CS V24 - ADVANCED VISUAL BASIC - 3 Units**

Prerequisite: CS V22 or equivalent

Hours: 2.5 lecture, 1.5 laboratory weekly

This course presents object-oriented programming with Visual Basic to the student. The course begins with a review of advanced-level event model design methods for Single-Document Interface (SDI) and Multiple-Document Interface (MDI) applications. It then moves on to introduce the object-oriented programming paradigm, focusing on the definition and use of classes along with the fundamentals of object-oriented design. Other topics include an overview of programming language principles, analysis of algorithms, building ActiveX components and an introduction to software engineering issues.

Fees will be required. Field trips may be required. Transfer credit: CSU.

**CS V30 - BEGINNING C++ - 3 Units**

Prerequisite: CS V04 or equivalent; and MATH V03 or 1 year of high school intermediate algebra (Algebra II) with grade of C or better

Hours: 2.5 lecture, 1.5 laboratory weekly

This course introduces the student to the concepts of object-oriented programming. The course begins with a review of control structures and data types with emphasis on structured data types and array processing. It then moves to introduce the object-oriented program paradigm, focusing on the definition and use of classes along with fundamentals of object-oriented design. Other topics include an overview of programming language principles, analysis of algorithms, and an introduction to software engineering issues. A complete object-oriented development framework is presented that encourages extensibility, reusability, and manages complexity.

Fees will be required. Field trips may be required. Transfer credit: CSU; UC; credit limitations - see counselor.

**CS V00 - BEGINNING C - 3 Units**

Prerequisite: CS V04 or equivalent; and MATH V03 or 1 year of high school intermediate algebra (Algebra II) with grade of C or better

Recommended preparation: CS V11 or equivalent

Hours: 2.5 lecture, 1.5 laboratory weekly

This course introduces the students to programming with C language. Included in this course is program design process, C operators, standard I/O functions, strings, pointers, arrays, data types, storage classes, file operations, and design of common algorithms. Algorithms are implemented as structured programs in C language.

Fees will be required. Field trips may be required. Transfer credit: CSU; UC; credit limitations - see counselor.

**CS V82 - UNIX SYSTEMS PROGRAMMING - 3 Units**

Prerequisite: CS V80 or equivalent

Hours: 2.5 lecture, 1.5 laboratory weekly

This course builds on the student's knowledge of the C programming language and introduces UNIX features and facilities. The course helps the student to explore issues related to programming in a UNIX environment. The difference between programming in a DOS/Windows environment and in a UNIX/Windows environment is covered focusing on the UNIX system call interface, the programming interface between the UNIX Kernel and applications software running in the UNIX environment. Students will create 32-bit applications in the UNIX programming environment.

Fees will be required. Field trips may be required. Transfer credit: CSU; UC; credit limitations - see counselor.

**CS V86 - FORTRAN PROGRAMMING - 3 Units**

Prerequisite: CS V04 or equivalent; and MATH V03 or 1 year of high school intermediate algebra (Algebra II) with grade of C or better

Recommended preparation: CS V11 or equivalent

Hours: 2.5 lecture, 1.5 laboratory weekly

This course presents to the student the concept of programming with FORTRAN. Topics include numerical computing, data types, control structures, programs and subprograms, dynamic memory allocation, pointers, arrays, files, and the mechanics of running, testing and debugging. The course emphasizes good software engineering principles and developing fundamental programming skills in the context of the FORTRAN programming language.

Fees will be required. Field trips may be required. Transfer credit: CSU; UC; credit limitations - see counselor.

**CS V88 - COMPUTER SCIENCE WORKSHOPS - .5-10 Units**

Prerequisite: varies with topic

Hours: lecture and/or laboratory as required by unit formula

Designed to meet specific needs of the college and community, as required and requested by persons whose needs in this area are not met by present course offerings.

Fees may be required. Courses with same title may not be repeated; may be taken for a maximum of 4 times.

**CS V89 - WORKSHOPS IN COMPUTER SCIENCE - .5-10 Units**

Prerequisite: varies with topic

Hours: lecture and/or laboratory as required by unit formula

Designed to meet specific needs of the college and community, as required and requested by persons whose needs in this area are not met by present course offerings.

Fees may be required. Courses with same title may not be repeated; may be taken for a maximum of 4 times. Transfer credit: CSU; for UC, determined after admission.

**CS V90 - DIRECTED STUDIES IN COMPUTER SCIENCE - 1-6 Units**

Prerequisite: varies with topic

Hours: lecture and/or laboratory as required by unit formula

This course offers specialized study opportunities for students with intermediate skills, who wish to pursue projects not included in the regular curriculum. Students are accepted only by written project proposal approved by the discipline prior to enrollment.

May be taken for a maximum of 4 times not to exceed 6 units. Transfer credit: CSU; for UC, determined after admission.