

COMPUTER SCIENCE

Computer Science focuses on the design, modeling, analysis, and applications of computer-related systems. The Computer Science program at Ventura College prepares students for further study in computer technologies and training necessary to understand, design, implement and use the software and hardware of digital computers and digital systems.

CS V11 Programming Fundamentals 3 Units

In-Class Hours: 43.75 lecture, 26.25 laboratory

Advisories/Rec Prep: MATH V03

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.

Grade Modes: Letter Graded

Field Trips: May be required

Degree Applicability: Applies to Associate Degree

AA/AS GE: D2

Transfer Credit: CSU, UC

UC Credit Limitations: None

CSU GE-Breadth: None

IGETC: None

CS V13 Object-Oriented Programming 3 Units

In-Class Hours: 43.75 lecture, 26.25 laboratory

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

This course introduces the concepts of object-oriented programming to students with a 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.

Grade Modes: Letter Graded

Degree Applicability: Applies to Associate Degree

AA/AS GE: D2

Transfer Credit: CSU, UC

UC Credit Limitations: None

CSU GE-Breadth: None

IGETC: None

CS V15 Data Structures and Algorithms 3 Units

In-Class Hours: 43.75 lecture, 26.25 laboratory

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

This course builds on the foundation provided by the programming fundamentals/object-oriented programming sequence to introduce the fundamental concepts of data structures and the 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.

Grade Modes: Letter Graded

Field Trips: May be required

Degree Applicability: Applies to Associate Degree

AA/AS GE: D2

Transfer Credit: CSU, UC

UC Credit Limitations: None

CSU GE-Breadth: None

IGETC: None

CS V17 Discrete Structures 3 Units

Same-As: MATH V52

In-Class Hours: 52.5 lecture

Prerequisites: MATH V20 or both MATH V04 and MATH V05 or MATH V19; or placement as measured by the college assessment process

Advisories/Rec Prep: CS V11 or equivalent

C-ID: MATH 160, COMP 152

This course introduces the student to discrete mathematics as it is used in computer science. Topics include formal logic, proofs, sets, combinatorics, probability, functions, graph theory, Boolean Algebra, and Modeling with programming.

Grade Modes: Letter Graded

Field Trips: May be required

Credit Limitations: see counselor.

Degree Applicability: Applies to Associate Degree

AA/AS GE: D2

Transfer Credit: CSU, UC

UC Credit Limitations: None

CSU GE-Breadth: B4

IGETC: 2A

CS V19 Computer Architecture and Organization 3 Units

In-Class Hours: 43.75 lecture, 26.25 laboratory

Prerequisites: CS V15 or equivalent; and CS V17 or MATH V52 or equivalent

C-ID: COMP 142

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 student an introduction to assembly language for low-level programming of system software and computer applications.

Grade Modes: Letter Graded

Field Trips: May be required

Degree Applicability: Applies to Associate Degree

AA/AS GE: None

Transfer Credit: CSU, UC

UC Credit Limitations: None

CSU GE-Breadth: None

IGETC: None

CS V30 Beginning C++ 3 Units*Formerly:* MATH V55*In-Class Hours:* 43.75 lecture, 26.25 laboratory

Prerequisites: MATH V03 or 1 year of high school intermediate algebra (Algebra II) or any higher-level math course with grade of C or better
 This course introduces the student to the concepts of object-oriented programming. The course reviews control structures and data types with emphasis on structured data types and array processing. It introduces 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, and an introduction to software engineering issues. A complete object-oriented development framework is presented that encourages extensibility, reusability, and manages complexity.

Grade Modes: Letter Graded**Field Trips:** May be required**Degree Applicability:** Applies to Associate Degree**AA/AS GE:** D2**Transfer Credit:** CSU, UC**UC Credit Limitations:** None**CSU GE-Breadth:** None**IGETC:** None**CS V40 Beginning Java 3 Units***Formerly:* MATH V56*In-Class Hours:* 43.75 lecture, 26.25 laboratory

Prerequisites: MATH V03 or 1 year of high school intermediate algebra (Algebra II) or any higher-level math course with grade of C or better
 This course introduces the student to fundamental concepts of object-oriented programming with Java. Topics include data types, control structures, functions, arrays, files, and the mechanics of running, testing, and debugging. 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. The course also offers an introduction to the historical and social context of computing and an overview of computer science as a discipline.

Grade Modes: Letter Graded**Degree Applicability:** Applies to Associate Degree**AA/AS GE:** D2**Transfer Credit:** CSU, UC**UC Credit Limitations:** None**CSU GE-Breadth:** None**IGETC:** None**CS V42 Intermediate Java 3 Units***In-Class Hours:* 43.75 lecture, 26.25 laboratory*Prerequisites:* CS V13 or CS V40 or equivalent

This course builds on the students knowledge of object oriented design and provides the student with the skills and techniques to create Java applications and applets. Topics included in this course are the Java language, Java API, Java programming techniques, integrating graphics, security issues, Java tools, Java applets, and JavaScript.

Grade Modes: Letter Graded, Student Option- Letter/Credit, Pass/No Pass Grading**Field Trips:** May be required**Degree Applicability:** Applies to Associate Degree**AA/AS GE:** D2**Transfer Credit:** CSU, UC**UC Credit Limitations:** None**CSU GE-Breadth:** None**IGETC:** None**CS V90 Direct Study: Computer Science 1-6 Units***Prerequisites:* varies with topic

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

Grade Modes: Letter Graded, Student Option- Letter/Credit, Pass/No Pass Grading**Degree Applicability:** Applies to Associate Degree**AA/AS GE:** None**Transfer Credit:** CSU**UC Credit Limitations:** None**CSU GE-Breadth:** None**IGETC:** None**CS V95 Computer Science Internship I 1-4 Units***Corequisites:* enrolled in a minimum of 7 units to include internship*Advisories/Rec Prep:* completion of or concurrent enrollment in one course in the discipline

This course offers students who are volunteers (unpaid) an opportunity to obtain work experience related to their field of study. Students are accepted as a result of consultation with a designate faculty member in the discipline and the acceptance of an approved work proposal.

Grade Modes: Pass/No Pass Grading**Field Trips:** Will be required**Credit Limitations:** see counselor; for UC, determined after admission.

Offered on a pass/no pass basis only.

Degree Applicability: Applies to Associate Degree**AA/AS GE:** None**Transfer Credit:** CSU**UC Credit Limitations:** None**CSU GE-Breadth:** None**IGETC:** None**CS V96 Computer Science Internship II 1-4 Units***Corequisites:* enrolled in a minimum of 7 units to include internship*Advisories/Rec Prep:* completion of or concurrent enrollment in one course in the discipline

This course offers students who are employed in the field an opportunity to expand their work experience related to their field of study. Students are accepted as a result of consultation with a designated faculty member in the discipline and the acceptance of an approved work proposal.

Grade Modes: Pass/No Pass Grading**Field Trips:** Will be required**Credit Limitations:** see counselor; for UC, determined after admission.

Offered on a pass/no pass basis only.

Degree Applicability: Applies to Associate Degree**AA/AS GE:** None**Transfer Credit:** CSU**UC Credit Limitations:** None**CSU GE-Breadth:** None**IGETC:** None