COMPUTER SCIENCE (CS)

CS A131 **4 Units (63 lecture hours; 27 lab hours)**
Python Programming I
Advisory: CIS A090; and CIS A100 or CIS A111.

Grading Mode: Standard Letter
Transfer Credit: CSU; UC.

Introduction to fundamental concepts and techniques for writing software in the Python programming language. Covers the syntax and semantics of data types, expressions, exceptions, control structures, Input/output, methods, classes, and pragmatics of Python programming. **C-ID:** COMP 112.

CS A140 **4 Units (63 lecture hours; 27 lab hours)**
Introduction to C#.NET Programming
Advisory: CIS A100 or CIS A111.

Grading Mode: Standard Letter, Pass/No Pass
Transfer Credit: CSU; UC.

Provides students with a background in the object-oriented approach of the C#.NET language. Emphasis is on variables, methods, control structures, arrays, objects, classes, file I/O, database and Windows Forms. This course may also be offered online. May be taken for grades or on a pass-no pass basis. Lecture/Lab. Graded or Pass/No Pass option.

CS A150 **4 Units (63 lecture hours; 27 lab hours)**
C++ Programming Language 1
Prerequisite(s): CS A131 or CS A140 or CS A170.

Grading Mode: Standard Letter, Pass/No Pass
Transfer Credit: CSU; UC.

First course in ANSI/ISO Standard C++ programming language. Topics include data types, strings, operators, expressions, control flow, input/output, functions, pointers, arrays, preprocessor, streams, enumerated data type, dynamic memory allocation, objects, classes, vectors, inheritance, object-oriented design and recursion. Graded or Pass/No Pass option. This course may also be offered online.

CS A170 **4 Units (63 lecture hours; 27 lab hours)**
Java Programming 1
Advisory: CIS A090; and CIS A100 or CIS A111.

Grading Mode: Standard Letter, Pass/No Pass
Transfer Credit: CSU; UC.

A first Computer Science course taught using the Java programming language. Students will build Java applications. Emphasis will be placed on programming fundamentals such as variables, selection and loops as well as object-oriented programming concepts including classes and inheritance. This course may also be offered online. Graded or Pass/No Pass option. **C-ID:** COMP 122.

CS A200 **4 Units (63 lecture hours; 27 lab hours)**
Data Structures
Prerequisite(s): CS A150 and CS A250.

Grading Mode: Standard Letter, Pass/No Pass
Transfer Credit: CSU; UC.

A study of data abstraction and algorithm analysis. Data structures include lists, stacks, queues, trees, tables, and graphs. Algorithms include searching, sorting, pattern-matching, tree traversal, and balancing. This is a core course for students who want to study advanced programming, computer science, or engineering. Graded or Pass/No Pass option.

CS A216 **4 Units (63 lecture hours; 27 lab hours)**
Computer Architecture
Prerequisite(s): CS A150 and CS A170 or CS A131.

Grading Mode: Standard Letter, Pass/No Pass
Transfer Credit: CSU; UC.

A course in the architecture of computers. Topics will include Boolean algebra and computer arithmetic, digital logic, micro and macro architecture, Assembly language, performance, datapath and control, memory hierarchies, interfacing and peripherals, and multiprocessing. Graded or Pass/No Pass option. Five hours.

CS A220 **4 Units (54 lecture hours; 54 lab hours)**
Software Engineering
Prerequisite(s): CS A150 and CS A170 or CS A131.

Grading Mode: Standard Letter, Pass/No Pass
Transfer Credit: CSU; UC.

Introduction to the concepts, methods, and current practice of software engineering. Study the lifecycle of a software system. Employ engineering methods, processes, techniques, and measurement. Use of tools to manage software development. Project work is required to illustrate the various elements. Graded or Pass/No Pass option.

CS A231 **4 Units (63 lecture hours; 27 lab hours)**
Python Programming II
Prerequisite(s): CS A131.

Grading Mode: Standard Letter
Transfer Credit: CSU; UC.

Advanced Python programming. Covers classes, modules, using the Python standard library and using third-party libraries.

CS A250 **4 Units (54 lecture hours; 54 lab hours)**
C++ Programming Language 2
Prerequisite(s): CS A150; and CS A131 or CS A170.

Grading Mode: Standard Letter, Pass/No Pass
Transfer Credit: CSU; UC.

Second course in ANSI/ISO Standard C++ programming language. Topics include sorting and searching, data structures, operator overloading, memory management, exception handling, name scope management, polymorphism, templates, STL containers, STL algorithm and iterators, and functional programming. Graded or Pass/No Pass option.

CS A253 **4 Units (72 lecture hours)**
Principles in System Design
Prerequisite(s): CS A150 and CS A170.

Grading Mode: Standard Letter
Transfer Credit: CSU; UC.

This lab is required by four-year institutions, coupled with CS A253, to satisfy lower-division work that prepares students for upper-division work in Computer Science.

CS A253L **1 Unit (54 lab hours)**
Principles in System Design Lab
Prerequisite(s): CS A150 and CS A170.

Grading Mode: Standard Letter
Transfer Credit: CSU; UC.

This lab is required by four-year institutions, coupled with CS A253, to satisfy lower-division work that prepares students for upper-division work in Computer Science.

CS A255 **3 Units (90 lecture hours)**
Cybersecurity Foundations and Principles
Grading Mode: Standard Letter, Pass/No Pass
Transfer Credit: CSU.

Cybersecurity is the science of protecting users and systems against hackers, malware, and other threats permeating modern day cyberspace. This course covers the theoretical foundations of cybersecurity, such as the concepts of confidentiality, integrity, and availability, and access control models, as well as the principles and practices of system, information, and network security. Graded or Pass/No Pass option.

CS A257 **3 Units (54 lecture hours)**
Boolean Algebra and Logic
Prerequisite(s): CS A131, CS A140, CS A150, or CS A170.

Grading Mode: Standard Letter
Transfer Credit: CSU; UC.

An introduction to the discrete structures used in Computer Science. Topics covered include basic logic, proof techniques, relations, Boolean algebra, logic gates, languages and grammars, finite-state machines, and Turing machines.

CS A262 **3 Units (36 lecture hours; 54 lab hours)**
Discrete Structures
Prerequisite(s): CS A131, CS A140, CS A150, or CS A170.

Grading Mode: Standard Letter
Transfer Credit: CSU; UC.

An introduction to the discrete structures used in Computer Science with an emphasis on their applications. Topics covered include functions, relations, sets, basic logic, proof techniques, basics of counting, graphs, trees, and discrete probability. **C-ID:** COMP 152.

CS A263 **4 Units (63 lecture hours; 27 lab hours)**
Probability and Statistics for Computer Science
Prerequisite(s): CS A131 or CS A140 or CS A150 or CS A170 and MATH A180.

Grading Mode: Standard Letter, Pass/No Pass
Transfer Credit: CSU; UC.

Introduction to probability and statistics with an emphasis on their applications in Computer Science. Topics include continuous and discrete probability distributions, linear and logistic regression, creating models to use for predictive inference, and programmatic analysis of data. Graded or Pass/No Pass option.

CS A272 **4 Units (63 lecture hours; 27 lab hours)**
Java Programming 2
Prerequisite(s): CS A170.

Grading Mode: Standard Letter, Pass/No Pass
Transfer Credit: CSU; UC.

A second course in Java programming language. Topics include object-oriented design, inheritance, interfaces, abstract and anonymous inner classes, I/O & exceptions, generics, regular expressions, databases, XML, GUI construction, graphics and multimedia, Java collections, data structures, lambda expressions and multithreading. This course may also be offered online. Graded or Pass/No Pass option.

CS A273 **4 Units (63 lecture hours; 27 lab hours)**
Mobile Application Development
Prerequisite(s): CS A150 and CS A170 or CS A272.

Grading Mode: Standard Letter
Transfer Credit: CSU; UC.

This course covers how to develop Apple iOS and Android apps for smartphones and tablets using open-source IDEs (Integrated Development Environments). Topics include mobile app IDEs, MVC (Model-View-Controller) architecture, programming languages, data management, user interface elements, event handling, testing, and publishing. Students will leverage their knowledge of OOP (Object-Oriented Programming) knowledge to build mobile apps from start to finish.

CS A280 **1-4 Units (18-72 lecture hours)**
Current Topics in Computing
Grading Mode: Standard Letter, Pass/No Pass
Transfer Credit: CSU.

Course covers topics currently receiving attention by the computer industry. This course may also be offered online. Graded or Pass/No Pass option. This course may be taken four times.