COMPUTER SCIENCE (CS)

119 PROGRAM DESIGN AND DEVELOPMENT   3 UNITS
C-ID COMP 112 (with CS 119L)
Corequisite: CS 119L
Recommended Preparation: "C" grade or higher or "Pass" in CIS 110 or equivalent
3 hours lecture
Introductory course in program design and development using Java or other object-oriented programming language to serve as a foundation for more advanced programming, computer science or networking courses. Emphasizes the development of problem-solving skills while introducing students to computer science through the use of a modern object-oriented programming language. Devotes attention to the development of effective software engineering practices emphasizing such principles as design decomposition, encapsulation, procedural abstraction, testing and software reuse. Students will learn and apply standard programming constructs, problem-solving strategies, the concept of an algorithm, fundamental data structures, the machine representation of data, introductory graphics and networking.
CSU, UC

119L PROGRAM DESIGN AND DEVELOPMENT LAB   1 UNIT
C-ID COMP 112 (with CS 119)
Corequisite: CS 119
Recommended Preparation: "C" grade or higher or "Pass" in CIS 110 or equivalent
3 hours laboratory
Laboratory tutorials, drills and programming problems designed to help students master the concepts and programming projects presented/assigned in CS 119.
CSU, UC

175 MECHATRONICS: INTRODUCTION TO MICROCONTROLLERS AND ROBOTICS   3 UNITS
2 hours lecture, 3 hours laboratory
Mechatronics is the combination of mechanical, electronic, and computer engineering to create automatic "intelligent" devices. Microcontrollers offer an easy and flexible way to do this. This course introduces the use of microcontrollers to operate motors, lights, and other electromechanical devices in response to inputs from sensors. Application of these ideas through the development of an autonomous robot. *Also listed as ENGR 175. Not open to students with credit in ENGR 175.*
CSU

176 MECHATRONICS: PROTOTYPE DESIGN   3 UNITS
Prerequisite: "C" grade or higher or "Pass" in CS 175 or ENGR 175 or equivalent
2 hours lecture, 3 hours laboratory
This course focuses on electromechanical product development. Control of single chip microcontrollers including memory-mapped I/O (Input/Output), direct access to registers, and fine control of timing. Development of custom circuits including manufacture of printed circuits. Control of DC and AC motors and stepper motors. Development of mechanisms and transmissions. Introduction to manufacturing techniques. This course includes a capstone design project. *Also listed as ENGR 176. Not open to students with credit in ENGR 176.*
CSU

181 INTRODUCTION TO C++ PROGRAMMING   4 UNITS
C-ID COMP 122
Recommended Preparation: "C" grade or higher or "Pass" in CS 119 or equivalent, and intermediate algebra
3 hours lecture, 3 hours laboratory
Introduction to computer programming using C++. Students with no previous programming experience in C++ will learn how to plan and create well-structured programs, write programs using sequence, selection and repetition structures, and create and manipulate sequential access files, structs, classes, pointers and arrays.
CSU, UC

182 INTRODUCTION TO JAVA PROGRAMMING   4 UNITS
C-ID COMP 122
Prerequisite: "C" grade or higher or "Pass" in MATH 110 or equivalent
Recommended Preparation: "C" grade or higher or "Pass" in CS 119 or equivalent or experience programming in C++ or Java
3 hours lecture, 3 hours laboratory
Introductory course in the basics of the Java programming language focusing on object oriented methodology. Topics include classes, methods, parameters, arrays, modularity, abstraction, exception handling, and stream and file I/O. In addition to writing and using new classes, students will utilize the AWT and/or Swing libraries of classes. Basic inheritance and mobile application programming are introduced.
CSU, UC

281 INTERMEDIATE C++ PROGRAMMING AND FUNDAMENTAL DATA STRUCTURES   4 UNITS
C-ID COMP 132
Prerequisite: "C" grade or higher or "Pass" in CS 181 or equivalent
3 hours lecture, 3 hours laboratory
Continuation of CS 181. Provides the programmer with professional training in memory management, documentation, structured programming, and programming to professional standards using C++. Explores some of the more advanced concepts of preprocessing, low-level data objects, recursion, and dynamic data structures including linked lists, stacks, queues and trees. Laboratory instruction includes program development and execution.
CSU, UC

282 INTERMEDIATE JAVA PROGRAMMING AND FUNDAMENTAL DATA STRUCTURES   4 UNITS
C-ID COMP 132
Prerequisite: "C" grade or higher or "Pass" in CS 182 or equivalent
3 hours lecture, 3 hours laboratory
Continuation of CS 182. Implement and analyze a variety of data structures and the algorithms used with those data structures, and create abstract data types and learn how and when to utilize them. Fundamental data structures include multidimensional arrays, linked lists, stacks, queues, heaps, trees, and hash tables; learn when to use which of the available dynamic memory data structures. Tools for analyzing and predicting run time and memory usage are introduced, as is Big-O notation. A variety of sort algorithms are reviewed and analyzed for best, worst, and average case performance, and are compared with tree traversal algorithms. Develop increased sophistication in object-oriented basics such as inheritance, encapsulation, design of abstract data types and polymorphism, and gain experience by working on larger programs and managing large, multi-programmer projects. Laboratory instruction includes program development and execution. Mobile and database applications will be introduced.
CSU, UC