Computer Science and Information Systems - Computer Science (CSCI)

See also CSIS - Database, CSIS - Information Technology, CSIS - Networking, and CSIS - Web Technology

Contact the Computer Science and Information Systems Department for further information.
(760) 744-1150, ext. 2387
Office: ST 6
http://www.palomar.edu/csis

Associate in Arts Degrees -

AA Degree requirements are listed in Section 6 (green pages).
- Computer Science
- Computer Science with Emphasis in Video Gaming

Certificates of Achievement -

Certificate of Achievement requirements are listed in Section 6 (green pages).
- Computer Science
- Computer Science with Emphasis in Video Gaming

Certificates of Proficiency -

Certificate of Proficiency requirements are listed in Section 6 (green pages).
- Java Software Development
- Linux
- Mac Programming
- Video Game Artist
- Video Game Developer

PROGRAMS OF STUDY

Computer Science

Computer Science is the study and design of computer systems: both hardware and software. Computer scientists are primarily concerned with the design of algorithms, languages, hardware architectures, systems software, applications software and tools. Applications range from simple game playing to the control of space vehicles, power plants and factories, from banking machines to intelligent medical diagnosis systems. Computer Science professionals are concerned with the creation of computer and information systems for the benefit of society.

Emphasis in the Computer Science program is placed on the ability to solve problems and think independently. The program offers a foundation in data structures, computer architecture, software design, algorithms, programming languages and object-oriented programing. See a Counselor for additional university transfer requirements in this major.

A.A. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

Program Requirements		Units
CSCI 105	Survey of Computer Science	4
CSCI 110	Programming for Computer Science	4
CSCI 210	Data Structures	4.5
CSCI 212	Machine Organization and Assembler Language	4
CSCI 220	C Programming	4
CSCI 222	C++ and Object-Oriented Programming	4
CSCI 230	Java GUI Programming	4
Electives (Select 3 courses)		
CSCI 130	Linux Fundamentals	2
CSCI 240	Windows API Programming	4
CSCI 242	Windows MFC Programming	3
CSCI 260	Video Game Programming I	4
CSDB 140	Introduction to Oracle	3
CSIT 180	C# Programming I	3
CSIT 290	Systems Analysis and Design	4
CSNT 111	Networking Fundamentals	3
MATH 245	Discrete Mathematics	3
TOTAL UNITS		**36.5 – 40.5**

Computer Science with Emphasis in Video Gaming

Computer Science is the study and design of computer systems: both hardware and software. Computer scientists are primarily concerned with the design of algorithms, languages, hardware architectures, systems software, applications software and tools. Applications range from simple game playing to the control of space vehicles, power plants and factories, from banking machines to intelligent medical diagnosis systems. Computer Science professionals are concerned with the creation of computer and information systems for the benefit of society.

Emphasis in the Computer Science program is placed on the ability to solve problems and think independently. The program offers a foundation in data structures, computer architecture, software design, algorithms, programming languages, and object-oriented programming. This program also introduces students to the video game industry, video game design and programming.

See a Counselor for additional university transfer requirements in this major.

A.A. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT*

Program Requirements		Units
CSCI 105	Survey of Computer Science	4
CSCI 110	Programming for Computer Science	4
CSCI 210	Data Structures	4.5
CSCI 212	Machine Organization and Assembler Language	4
CSCI 220	C Programming	4
CSCI 222	C++ and Object-Oriented Programming	4
CSCI 230	Java GUI Programming	4
Required Video Game Courses		
CSCI 160	Overview of the Video Game Industry	4
CSCI 161	Video Game Design	4
CSCI 260	Video Game Programming I	4
CSCI 261	Video Game Programming II	4
Electives (select 1 course)		
CSDB 140	Introduction to Oracle	3
CSIT 290	Systems Analysis and Design	4
CSNT 111	Networking Fundamentals	3
TOTAL UNITS		**47.5-48.5**

* Computer Science with Emphasis in Video Gaming A.A. Degree Major or Certificate of Achievement pending approval by the California Community Colleges System Office at the time of catalog publication.

Java Software Development

The Java Software Development certificate program is designed to introduce the fundamental concepts of object-oriented programming and the Java programming language along with standard Java application programming interface (API) packages. Learn to develop applications that run on servers as well as cross-platform applications (applications that can run on PCs, PDAs, or other devices). Gain an understanding of data structures, functionality, and Java's user-friendly design tools.

CERTIFICATE OF PROFICIENCY

Program Requirements		Units
CSCI 110	Programming for Computer Science	4
CSCI 210	Data Structures	4.5
CSCI 230	Java GUI Programming	4
CSCI 232	Java Mobile Programming	2
CSWB 270	Java Servlets and JSPs	3
TOTAL UNITS		**17.5**

To satisfy a prerequisite, the student must have earned a letter grade of A, B, C or CR in the prerequisite course, unless otherwise stated.

Linux

This certificate program in Linux/UNIX is designed for those currently in the computer industry who want to upgrade their skills, and for those with basic computer literacy who want to enter this fast-growing field. Fluency in Linux/UNIX can make the difference in winning a job or promotion, as more personnel directors regard knowledge and fluency in Linux/UNIX principles as key criteria for job recruitment and selection.

CERTIFICATE OF PROFICIENCY

Program Requirements		Units
CSCI 130	Linux Fundamentals	2
CSCI 132	Linux Shell Scripting	2
CSNT 140	Linux Administration	2
CSNT 141	Linux Networking and Security	2
TOTAL UNITS		**8**

Mac Programming

The Mac Programming certificate is designed for those wishing to explore Mac OS technologies. The Unix foundation of Mac OS, along with its powerful native application environments, cutting-edge development tools, and support of open source and open standards—make it a powerful, stable, and versatile development environment, capable of supporting development for mutliple deployment targets.

CERTIFICATE OF PROFICIENCY

Program Requirements		Units
CSCI 170	BSD Unix for Mac	2
CSCI 171	Mac OS AppleScripting	3
CSCI 222	C++ and Object-Oriented Programming	4
CSCI 270	Mac OS Cocoa Programming	3
CSCI 271	OpenGL for Mac OS	3
TOTAL UNITS		**15**

Video Game Artist

This certificate program introduces students to the video game industry, video game design, and the creation of both 2D and 3D artwork for video games.

CERTIFICATE OF PROFICIENCY

Program Requirements		Units
CSCI 160	Overview of the Video Game Industry	4
CSCI 161	Video Game Design	4
ART 241 or GCIP/	Computer Graphics	
R GCIP 140 or	Digital Imaging/Photoshop I	
GCIP 141 or	Digital Imaging/Photoshop II	
GCIP 240	Digital Imaging/Photoshop III	3
ARTI 246 or	Digital 3D Design and Modeling	
DT 180 or	3D Studio Max – Intro 3D Modeling/Animation	
DT 182	3D Studio Max – Adv 3D Modeling/Animation	3
ARTD 220 or	Motion Design	
ARTI 247 or	Digital 3D Design and Animation	
DT 184 or	Real Time 3D Technical/Game Animation	
GCMW 204	Motion Graphics for Multimedia	2,3
TOTAL UNITS		**16 - 17**

Video Game Artist Certificate of Proficiency is also listed under Graphic Communications - Multimedia and Web.

Video Game Developer

The Video Game Developer certificate program introduces students to the video game industry, video game design and programming.

CERTIFICATE OF PROFICIENCY

Program Requirements		Units
CSCI 160	Overview of the Video Game Industry	4
CSCI 161	Video Game Design	4
CSCI 260	Video Game Programming I	4
CSCI 261	Video Game Programming II	4
TOTAL UNITS		**16**

COURSE OFFERINGS

CSCI 105 Survey of Computer Science (4)
(Formerly CSIS 160)
3 hours lecture-2 hours lecture/laboratory
Transfer acceptability: CSU; UC – CSCI 105 and 110 combined: maximum credit, one course
An overview of the discipline of computer science including such topics as the history of computer science; machine architecture; data storage and manipulation; operating software engineering; data structures; database and information retrieval; data communications; artificial intelligence; theory of computation; social legal and ethical issues. Includes hands-on laboratory experience reinforcing the lecture material.

CSCI 110 Programming for Computer Science (4)
(Formerly CSIS 220)
3 hours lecture-2 hours lecture/laboratory
Prerequisite: CSCI 105
Transfer acceptability: CSU; UC; CAN CSIS 12
Introduces object-oriented programming and design using Java. Focuses on implementation and testing of software in a platform-independent, event-driven, graphical user interface environment. Covers basic concepts of data representation, user interface design, and software engineering.

CSCI 130 Linux Fundamentals (2)
(Formerly CSIS 225)
4 hours lecture/laboratory
Transfer acceptability: CSU
A hands on introduction to a computer operating system including operating system terminology, E-mail user utilities, file structure, file security, and an introduction to shell programming using the Bourne shell.

CSCI 132 Linux Shell Scripting (2)
(Formerly CSIS 226)
4 hours lecture/laboratory
Prerequisite: CSCI 130
Transfer acceptability: CSU
Intermediate concepts of shell script programming, advanced utilities, file management, and alternative editors. Includes usage of sed (stream editor), awk (a UNIX scripting language), and graphical user interfaces. Introduction to UNIX networking concepts.

CSCI 146 FORTRAN 90 for Mathematics and Science (3)
(Formerly CSIS 146)
2 hours lecture-3 hours laboratory
Prerequisite: A minimum grade of 'C' in MATH 135 or MATH 110 and 115, or a passing grade on the appropriate placement test
Note: Cross listed as Math 146
Transfer acceptability: CSU; UC
Programming in FORTRAN 90 to solve typical problems in mathematics, computer science, physical sciences, and engineering. Programming is done on a PC.

CSCI 160 Overview of the Video Game Industry (4)
(Formerly CSIS 241)
4 hours lecture
Transfer acceptability: CSU
Survey of the historical, technological, business, social and psychological aspects of the video game industry. Intended for those considering a career in the video game industry, or those with a strong interest in video games and how they are made.

CSCI 161 Video Game Design (4)
(Formerly CSIS 242)
4 hours lecture
Transfer acceptability: CSU
An introduction to video game design, including the study of various genres of games, and the preparation of a game design document. Intended for those considering a career in the video game industry, or those with a strong interest in video games and how they are made.

CSCI 170 BSD Unix for Mac (2)
4 hours lecture/laboratory
Transfer acceptability: CSU; UC (pending)
Introduction to BSD 4.3 UNIX (bash, bourne, tsh, csh) for command line terminal access and shell scripting on a Macintosh system.

CSCI 171 Mac OS AppleScripting (3)
2 hours lecture-2 hours lecture/laboratory
Transfer acceptability: CSU; UC
Introduction to scripting using Apple Inc.'s AppleScript Studio. Includes hands-on laboratory experience reinforcing the lecture material.

CSCI 197 Topics in Computer Science (.5-4)
(Formerly CSIS 197)
Units awarded in topics courses are dependent upon the number of hours required of the student. Any combination of lecture, laboratory, or lecture/laboratory may be scheduled by the department. Refer to Class Schedule.
Note: May be taken 4 times
Transfer acceptability: CSU; UC (pending)
Topics in Computer Science. See class schedule for specific topic offered. Course title will designate subject covered.

CSCI 210 Data Structures (4.5)
(Formerly CSIS 221)
3 hours lecture-3 hours lecture/laboratory
Prerequisite: CSCI 110
Transfer acceptability: CSU; UC
Focus on object-oriented programming and its principles of objects, classes, encapsulation, inheritance, graphical user interface, and its relationship to the Java programming language. Introduction to the principles of modularity, data abstraction, abstract data types as they apply to various data structures. Focus on the definition, implementation, and applications of the basic data structures and associated operators that are found in computer science. These include arrays, stacks, recursion, queues, lists, tables, references, trees, sorting, searching, event-driven structures that support the development of graphical user interfaces. Includes hands-on laboratory experience reinforcing the lecture material.

CSCI 212 Machine Organization and Assembler Language (4)
(Formerly CSIS 222)
3 hours lecture-2 hours lecture/laboratory
Prerequisite: CSCI 110
Transfer acceptability: CSU; UC
An introduction to Assembler Language programming. Language syntax is covered, together with a study of the instruction set mnemonics, segment, index, pointer, general purpose and flag registers. A variety of memory addressing techniques will be covered, as well as stack operations, particularly those associated with passing parameters to subroutine calls. Also includes I/O to screen, printer, and disk interfaces. Emphasis will be placed on interaction between the student's code and the operating system's supplied functions for I/O to peripheral devices. Use of editor and debugging tools will also be addressed.

CSCI 220 C Programming (4)
(Formerly CSIS 235)
3 hours lecture-2 hours lecture/laboratory
Transfer acceptability: CSU; UC
An introduction to the C programming language emphasizing top-down design and principles of structured programming. Includes hands-on laboratory experience reinforcing the lecture material. Language syntax is covered, together with operators, standard control structures, functions, input/output, arrays, strings, file manipulation, preprocessor, pointers, structures and dynamic variables.

CSCI 222 C++ and Object Oriented Programming (4)
(Formerly CSIS 280)
3 hours lecture-2 hours lecture/laboratory
Prerequisite: CSCI 110 or CSCI 220
Transfer acceptability: CSU; UC
Detailed study of the C++ programming language and its support for data abstraction and object-oriented programming. Presents an introduction to the fundamental elements of object-oriented programming including encapsulation, classes, inheritance, polymorphism, templates, and exceptions.

CSCI 230 Java GUI Programming (4)
3 hours lecture-2 hours lecture/laboratory
Prerequisite: CSCI 210
Transfer acceptability: CSU; UC (pending)
Graphical User Interface programming using Java. Emphasizing event-driven programming and the code to create GUI components such as buttons, text area, scrollable views. Includes hands-on laboratory experience reinforcing the lecture material..

CSCI 232 Java Mobile Programming (2)
4 hours lecture/laboratory
Prerequisite: CSCI 230
Transfer acceptability: CSU; UC (pending)
Focus on Java programming for mobile devices, using Java's principles of objects, classes, encapsulation, inheritance, and simple graphical user interfaces suitable for various mobile technologies. Use the principles of modularity, data abstraction, abstract data types as they apply to programs developed using the Java Mobile Environment's packages. Focus on the definition, implementation, and applications of simple Java programs using this environment. Includes hands-on laboratory experience reinforcing the lecture materials.

CSCI 240 Windows API Programming (4)
(Formerly CSIS 285)
3 hours lecture-2 hours lecture/laboratory
Prerequisite: CSCI 220
Transfer acceptability: CSU
An introduction to the fundamental concepts of Windows programming which will enable students to develop Windows applications using a graphical user interface. Includes a detailed study of the Windows Application Programming Interface.

CSCI 242 Windows MFC Programming (3)
(Formerly CSIS 288)
3 hours lecture-2 hours laboratory
Prerequisite: CSCI 222
Transfer acceptability: CSU
Windows programming using the WIN32 API for writing applications that use multitasking, threads, synchronization, and structured exception handling. Covers implementation of Dynamic Link Libraries (DLLs), Graphic Device Interface (GDI) optimization, and creation of Help files. Includes a detailed study of the Microsoft Foundation Class (MFC) Library. Presents techniques to add Object Linking and Embedding (OLE) functionality to Windows applications.

CSCI 260 Video Game Programming I (4)
(Formerly CSIS 240)
3 hours lecture-2 hours lecture/laboratory
Prerequisite: CSCI 222
Note: May be taken 4 times
Transfer acceptability: CSU
Introduction to the programming of video games. Course will explore 3D game development with Microsoft's DirectX 9.0. Students learn how to create a 3D game from scratch. They learn the basics of designing and using a 3D engine. Includes hands-on laboratory experience reinforcing the lecture, text, and course materials.

CSCI 261 Video Game Programming II (4)
(Formerly CSIS 243)
3 hours lecture-2 hours lecture/laboratory

Prerequisite: CSCI 260
Note: May be taken 4 times
Transfer acceptability: CSU
Builds on basic 3D game programming skills acquired during Video Game Programming I. Focuses on sound, input, networking and methods such as artificial intelligence to drive these games. Includes hands-on laboratory experience reinforcing the lecture, text and course materials.

CSCI 270 Mac OS Cocoa Programming (3)
2 hours lecture-2 hours lecture/laboratory
Prerequisite: CSCI 110 or CSCI 220
Transfer acceptability: CSU; UC
Introduction to programming using Objective-C language, Apple's X-Code and Interface Builder for creating applications targeting the Macintosh platform with event-driven structures that support the development of graphical user interfaces. Includes hands-on laboratory experience reinforcing the lecture material.

CSCI 271 OpenGL for Mac OS (3)
2 hours lecture-2 hours lecture/laboratory
Prerequisite: CSCI 270
Transfer acceptability: CSU
Macintosh OS X Cocoa Software Development Environment. Introduction to programming using Objective-C language, Apple's X-Code and Interface Builder for creating applications targeting the Macintosh platform with event-driven structures that support the development of graphical user interfaces. Includes hands-on laboratory experience reinforcing the lecture material.

CSCI 295 Directed Study in Computer Science (1,2,3)
(Formerly CSIS 295)
3, 6, or 9 hours laboratory
Prerequisite: Approval of project or research by department chairperson/director
Note: May be taken 4 times for a maximum of 6 units
Transfer acceptability: CSU; UC – Credit determined by UC upon review of course syllabus
Designed for the student who has demonstrated a proficiency in computer science subjects and the initiative to work independently on a particular sustained project which does not fit into the context of regularly scheduled classes.

Computer Science and Information Systems - Database (CSDB)

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Certificates of Proficiency -

Certificate of Proficiency requirements are listed in Section 6 (green pages).
- Microsoft SQL Database Administrator
- Oracle Database

PROGRAMS OF STUDY

Microsoft SQL Database Administrator

Microsoft SQL Database Administrator is a validation program that provides a reliable measure of technical proficiency and expertise in implementation and administration of Microsoft SQL Server™ databases.

CERTIFICATE OF PROFICIENCY

Program Requirements		Units
CSDB 210	SQL Server Administration	2
CSDB 220	SQL Server Programming	3
CSNT 111	Networking Fundamentals	3
CSNT 121	Windows Server	3
CSNT 221	Windows Infrastructure Administration	3
TOTAL UNITS		**14**

Oracle Database

Oracle is the most widely used relational database management system in the world. This certificate offers a series of courses designed to provide the fundamentals to become successful in the use of this powerful database system.

CERTIFICATE OF PROFICIENCY

Program Requirements		Units
CSDB 140	Introduction to Oracle	3
CSDB 240	Oracle DBA I	3
CSDB 241	Oracle DBA II	3
CSDB 250	Oracle Performance Tuning	3
Electives (Select 1 course)		
CSDB 150	Oracle Data Base Design	3
CSDB 260	Oracle PL/SQL Programming	3
TOTAL UNITS		**15**

COURSE OFFERINGS

CSDB 110 Introduction to SQL (3)
(Formerly CSIS 196)
2 hours lecture-2 hours lecture/laboratory
Transfer acceptability: CSU
Intended for individuals who want to learn how to search for and manipulate data in a database, create tables and indexes, handle security, control transaction processing, and learn the basics of how to design a database.

CSDB 120 SQL Database Design (2)
(Formerly CSIS 267)
2 hours lecture-2 hours laboratory
Prerequisite: CSDB 110
Transfer acceptability: CSU
Provides training in administering and implementing Microsoft SQL Server.

CSDB 140 Introduction to Oracle (3)
(Formerly CSIS 252)
2 hours lecture-2 hours lecture/laboratory
Transfer acceptability: CSU
An introduction to relational database concepts including the design and creation of database structures to store, retrieve, update and display data.

CSDB 150 Oracle Database Design (3)
(Formerly CSIS 254)
2 hours lecture-2 hours lecture/laboratory
Prerequisite: CSDB 140
Transfer acceptability: CSU
A top-down, systematic approach to the development of Oracle relational databases.

CSDB 210 SQL Server Administration (2)
(Formerly CSIS 172)
1½ hours lecture-1 hour lecture/laboratory
Prerequisite: CSDB 110
Transfer acceptability: CSU
Provides students with the knowledge and skills necessary to administer and troubleshoot information systems that incorporate Microsoft SQL Server Enterprise Edition.