COMPUTER SCIENCE

Program Purpose: Computer Science involves the design, modeling, analysis, and applications of computer-related systems. Students who complete the Computer Science Program will be able to critically think and work with computers and computer programs both as consumers and/or programmers. Students will also gain knowledge in computer programming by learning programming skills and the functional capabilities and limitations which it entails. Students who successfully complete computer science courses will gain "hands-on" experience writing computer program codes in one or more computer languages, develop effective methodologies to problem solving using symbolic and abstract reasoning, and employ sound programming techniques. The Computer Science Program prepares students for transfer to a degree completion institution, and it also provides vocational training in the design, implementation, and use of computer software and hardware for digital systems.

Computer Science is concerned with the design, modeling, analysis, and applications of computer-related system 170s. The Computer Science program at Moorpark College prepares students for further study in Computer Science. It also provides vocational training necessary to understand, design, implement, and use the software and hardware of digital computers and digital systems.

Transfer Information

Students planning to transfer need to consult with a counselor, prepare a Student Education Plan, and take advantage of the support services available in the Career Transfer Center located in Fountain Hall, (805) 378-1536.

NOTE: Some courses may have credit limitations. Refer to the **Credit Limitations** and **UC Credit Limitations** areas or see the UC Transfer Course Agreement (http://catalog.vcccd.edu/moorpark/transfer-information/transfer-uc/#uctcatext) page for details.

CS M01 Introduction to Computer Science 3 Units
In-Class Hours: 43.75 lecture, 26.25 laboratory
Provides an introduction to various topics in computer science. Discusses computer hardware, computer operating systems, algorithms, computer programming, computer networks, the Internet, databases, ethical issues, and current events which involve technology issues.
Advisories/Rec Prep: Basic computer literacy skills including file manipulation, editing of documents, and using an operating system
Grade Modes: Letter Graded, Credit by exam, license etc., Student Option-Letter/Credit, Pass/No Pass Grading
Degree Applicability: Applies to Associate Degree
AA/AS GE: D2
Transfer Credit: CSU, UC
UC Credit Limitations: CS M01 and CS M125 combined: maximum credit, 4 units
CSU GE-Breadth: None
IGETC: None

CS M10DB Database Management Systems and Applications 3 Units
In-Class Hours: 43.75 lecture, 26.25 laboratory
Introduces modern database concepts while emphasizing the relational database model. Includes such topics as design methodologies, normalization of tables to reduce redundancies, supertypes and subtypes to reduce nulls, data integrity, referential integrity, and using locks and other techniques for concurrency control in a multi-user database. Describes the factors that should be balanced during the design of a database. Documents databases, entity relationship diagrams, relational schemas, and data dictionaries are described. Applies the principles by performing exercises using MS SQL Server, MySQL, or other database management system. Uses SQL and other languages to create and fill tables, retrieve data, and manipulate it by stored programs.
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
UC Credit Limitations: None
CSU GE-Breadth: None
IGETC: None

CS M10DS Introduction to Data Science 3 Units
In-Class Hours: 52.5 lecture
Provides a comprehensive introduction to the field of Data Science. Studies machine learning which is a type of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed. Distinguishes supervised and unsupervised machine learning (Data Mining) algorithms. Studies the emergence of massive datasets containing millions or even billions of observations which provides the primary incentive for the field, such data sets arise, for instance, in large-scale retailing, telecommunications, astronomy, engineering, health, and internet social media. Provides the key knowledge of data development, management, statistical analysis, data visualization, and inference.
Advisories/Rec Prep: CS M10P or CS M10J or CS M10A or CS M125
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
UC Credit Limitations: None
CSU GE-Breadth: None
IGETC: None

CS M10J Introduction to Computer Programming Using Java 4 Units
In-Class Hours: 52.5 lecture, 52.5 laboratory
Introduces the basic components, syntax, and semantics of the Java programming language are covered. Uses the Java computer language to introduce basic programming concepts such as algorithms, data and control structures, debugging, documentation, graphical user interface (GUI) and object-oriented programming.
Advisories/Rec Prep: CS M01 and basic computer usage knowledge or CS M125 (or CSM10A) and MATH M06 or MATH M07
Grade Modes: Letter Graded, Student Option- Letter/Credit, Pass/No Pass Grading
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 M10ML Cloud Data Science and Machine Learning 2 Units
In-Class Hours: 17.5 lecture, 52.5 laboratory
Prerequisites: MATH M15 or MATH M15H, CS M10P, CS M10R, CS M10DS
Utilizes various cloud based Data Science tools and services available from Amazon Web Services (AWS) cloud platform to perform data science analysis and machine learning. Uses various examples of how data science and machine learning is used to process vast amounts of collected data to derive predictive analysis. Uses tools such as AWS SageMaker and Amazon Forecast and computer vision tools such as Amazon Rekognition, Amazon Ground Truth, image and video processing and other AWS data science services. Uses Natural Language processing such as Amazon Polly, Amazon Comprehend, and Amazon Translate. Uses AWS Academy Data Science and Machine Learning curriculum. Aligns to Data Science industry professional certification training. Prepares students to pass relevant AWS data science professional certification.
Advisories/Rec Prep: CS M10R and CS M10P
Grade Modes: Letter Graded, Credit by exam, license etc., Student Option-Letter/Credit, Pass/No Pass Grading
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 M10P Introduction to Computer Programming using Python Language 4 Units
In-Class Hours: 52.5 lecture, 52.5 laboratory
Provides an introduction to computer programming and algorithm design using the Python programming language. Covers the fundamentals of computer programming: basic data types, switching and looping constructs, functions, recursion, objects, arrays, and lists, and basic input and output, both interactive and with files. Explains some principles of algorithm design and analysis as well as techniques for testing programs.
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
UC Credit Limitations: None
CSU GE-Breadth: None
IGETC: None

CS M10R Introduction to R Programming 3 Units
In-Class Hours: 52.5 lecture
Introduces computer programming and algorithm design using the R programming language. Covers an introduction to R, from installation to most of the statistical concepts, and machine learning. Includes the fundamentals of computer programming concepts: basic data types, variables, if-else, loops, functions, vectors, objects, matrices, arrays, data frames, lists, factors, basic input, data visualization, and output with files. Explains some principles of algorithm design and analysis as well as techniques for testing programs.
Advisories/Rec Prep: MATH M15 or MATH M15H and CSM10P or CSM125 or CSM10J
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
UC Credit Limitations: None
CSU GE-Breadth: None
IGETC: None

CS M15W Client-Side Web Development Using HTML/JavaScript 3 Units
In-Class Hours: 35 lecture, 52.5 laboratory
Introduces students to different methodologies used to develop webpages. Explains the syntax and semantics of Hyper Text Markup Language (HTML). Introduces the different tools to create dynamic and static webpages using Cascading Style Sheets (CSS) and JavaScript. Develops written, oral communication and analysis skills in students so they can review and critique web content from a developer's perspective.
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
UC Credit Limitations: None
CSU GE-Breadth: None
IGETC: None

CS M16PH Server-Side Development using PHP 3 Units
In-Class Hours: 35 lecture, 52.5 laboratory
Applies best coding practices using Personal Home Page (PHP) language. Introduces different techniques to connect client side code hypertext markup language (HTML) with databases using queries. Performs different input/output (I/O) operations to manipulate data. Enables students to manage sessions and track user activities among different pages using sessions, cookies and database queries.
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
UC Credit Limitations: None
CSU GE-Breadth: None
IGETC: None

CS M25M iOS Development I 3 Units
In-Class Hours: 35 lecture, 52.5 laboratory
Introduces students to the basics of mobile app development using iOS as a development platform. Assists students in building foundation programming skills to create well-designed mobile apps based on user requirements. Applies core graphics and touch handling techniques to allow users to interface with their applications.
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 M26M iOS Development II 3 Units
In-Class Hours: 35 lecture, 52.5 laboratory
Prerequisites: CS M25M
Exposes students to different programming standards relating to mobile/ user interaction. Develops the skills needed to create network-based apps. Develops code that uses mobile device peripherals such as Global Positioning System (GPS), camera and maps to provide users with better services.
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 M80 Internship in Computer Science 1-4 Units
In-Class Hours: 75-300 paid cooperative
Prerequisites: Completion of or concurrent enrollment in one course in the discipline and instructor approval
Provides on-the-job learning to develop effective work habits, attitudes, and career awareness in paid or unpaid internships that are related to the discipline. Involves the development and documentation of learning objectives and the completion of an internship paper, presentation, or project. Includes both workplace supervisor and faculty adviser feedback and/or written evaluations Course Credit Limitation: To take this course, contact the Career Transfer Center. Requires orientation session. Students receive one unit of credit for each 60 hours unpaid or 75 hours paid work. May enroll in up to 4 units a semester with a maximum of 16 total units of any type of work experience.
Grade Modes: Letter Graded, Student Option- Letter/Credit, Pass/No Pass Grading
Repeatable for Credit: Course may be taken up to 3 times for credit.
Degree Applicability: Applies to Associate Degree
AA/AS GE: None
Transfer Credit: CSU
UC Credit Limitations: None
CSU GE-Breadth: None
IGETC: None

CS M122 Independent Study - Computer Science 0.5-3 Units
Formerly: CS M22A
In-Class Hours: 26.25-157.5 laboratory
Prerequisites: Completion of one course in Computer Science and instructor approval
Allows independent study for students who wish to extend their knowledge of a particular area of Computer Science through research and study. Utilizes an approved independent project. Includes one-on-one work with instructor. Interested students should contact a Computer Science instructor for assistance in developing a contract for learning about a specific topic.
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: None
Transfer Credit: CSU
UC Credit Limitations: None
CSU GE-Breadth: None
IGETC: None

CS M125 Programming Concepts and Methodology I 3 Units
Formerly: CS M10A
In-Class Hours: 52.5 lecture
C-ID: COMP 122
Provides an introduction to the C++ programming language. Covers the basic components, syntax, and semantics of the C++ programming language. Introduces basic programming concepts such as algorithms, data and control structures, documentation, structured programming, arrays, and pointers.
Advisories/Rec Prep: CS M01 and MATH M06 or MATH M07
Grade Modes: Letter Graded, Credit by exam, license etc., Student Option- Letter/Credit, Pass/No Pass Grading
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 M135 Programming Concepts and Methodology II 3 Units
In-Class Hours: 52.5 lecture
Prerequisites: CS M125 or CS M10A
C-ID: COMP 132
Presents the design of programming applications using software engineering techniques. Discusses the development of large programs, data abstraction and structures and the associated algorithms.
Grade Modes: Letter Graded, Pass/No Pass Grading
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 M145 Computer Architecture and Organization 3 Units
In-Class Hours: 43.75 lecture, 26.25 laboratory
Prerequisites: CS M10A OR CS M125
C-ID: COMP 142
Introduces the organization and behavior of real computer systems at the assembly language level. Studies the mapping of statements and constructs in a high-level language into sequences of machine instructions. Discusses the internal representation of simple data types and structures and examines numerical computation, data representation errors and procedural errors.
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
UC Credit Limitations: None
CSU GE-Breadth: None
IGETC: None

CS M155 Discrete Structures 3 Units
In-Class Hours: 52.5 lecture
Prerequisites: CS M125 or CS M10A and MATH M07 or (MATH M05 and MATH M06)
C-ID: COMP 152
Introduces the discrete structures used in computer science with an emphasis on their applications. Covers functions, relations, sets, basic logic, proof techniques, basics of counting, graphs and trees, and discrete probability.
Grade Modes: Letter Graded, Student Option- Letter/Credit, Pass/No Pass Grading
Credit Limitations: MC, CSU and UC: CS M155 combined with MATH M21; maximum credit, one course.
Degree Applicability: Applies to Associate Degree
AA/AS GE: D2
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: B4
IGETC: 2A

- Computer Science, Associate in Science for Transfer (http://catalog.vcccd.edu/moorpark/programs-courses/computer-science/computer-science-ast/)

- Computer Programming, Certificate of Achievement (http://catalog.vcccd.edu/moorpark/programs-courses/computer-science/computer-programming-coa/)

- Web Design, Certificate of Achievement (http://catalog.vcccd.edu/moorpark/programs-courses/computer-science/web-design-coa/)

- Mobile App Developer (iOS), Proficiency Award (http://catalog.vcccd.edu/moorpark/programs-courses/computer-science/mobile-app-developer-pa/)

- Web Development, Proficiency Award (http://catalog.vcccd.edu/moorpark/programs-courses/computer-science/web-development-pa/)

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