II.A.13.05 See Page 3

CS M125: PROGRAMMING CONCEPTS AND METHODOLOGY I

Only the Originator, Co-Contributor(s), and Administrators can edit this proposal.

Originator
abarcenas

College
Moorpark College

Attach Support Documentation (as needed)
CS M125_state approval letter_formerly CS M10A.pdf

Discipline (CB01A)
CS - Computer Science

Course Number (CB01B)
M125

Course Title (CB02)
Programming Concepts and Methodology I

Banner/Short Title
Prog Concepts Methodology I

Credit Type
Credit

Start Term
Spring 2020

Formerly
CS M10A - Programming Concepts and Methodology I

Catalog Course Description
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. UC Credit Limitations - BUS M140, CIS M140, CS M01, CS M10A, and M125 combined: maximum credit, 4 units.

Taxonomy of Programs (TOP) Code (CB03)
0706.00 - Computer Science (transfer)

Course Credit Status (CB04)
D (Credit - Degree Applicable)

Course Transfer Status (CB05) (select one only)
A (Transferable to both UC and CSU)

Course Basic Skills Status (CB08)
N - The Course is Not a Basic Skills Course

SAM Priority Code (CB09)
E - Non-Occupational

Course Cooperative Work Experience Education Status (CB10)
N - Is Not Part of a Cooperative Work Experience Education Program

Course Classification Status (CB11)
Y - Credit Course

Educational Assistance Class Instruction (Approved Special Class) (CB13)
N - The Course is Not an Approved Special Class

Course Prior to Transfer Level (CB21)
Y - Not Applicable

Course Noncredit Category (CB22)
Y - Credit Course

Funding Agency Category (CB23)
Y - Not Applicable (Funding Not Used)

Course Program Status (CB24)
1 - Program Applicable

General Education Status (CB25)
Y - Not Applicable

Support Course Status (CB26)
N - Course is not a support course

Field trips
Will not be required

Grading method
(L) Letter Graded

Alternate grading methods
(O) Student Option- Letter/Pass
(P) Pass/No Pass Grading

Does this course require an instructional materials fee?
No

Repeatable for Credit
No

Is this course part of a family?
No

Units and Hours

Carnegie Unit Override
No

In-Class

Lecture
Minimum Contact/In-Class Lecture Hours
52.5
Maximum Contact/In-Class Lecture Hours
52.5

Activity

Laboratory

Total in-Class

Total in-Class
Total Minimum Contact/In-Class Hours
52.5
Total Maximum Contact/In-Class Hours
52.5

Outside-of-Class

Internship/Cooperative Work Experience

Paid

Unpaid

Total Outside-of-Class

Total Outside-of-Class
Minimum Outside-of-Class Hours
105
Maximum Outside-of-Class Hours
105

Total Student Learning

Total Student Learning
Total Minimum Student Learning Hours
157.5
Total Maximum Student Learning Hours
157.5

Minimum Units (CB07)
3
Maximum Units (CB06)
3

Advisories on Recommended Preparation
CS M01 and MATH M06 or MATH M07

Student Learning Outcomes (CSLOs)

	Upon satisfactory completion of the course, students will be able to:
1	analyze programming problems and design algorithms to solve those problems that require file management
2	apply best practices when writing code
3	apply the concepts of structured programming such as arrays, functions, loops to solve given problems.
4	demonstrate ability to communicate solutions to non-technical audience.
5	solve complex problems using Object Oriented Concepts.

Course Objectives

	Upon satisfactory completion of the course, students will be able to:
1	describe the basic organization of a computer system.
2	describe the basic components, syntax, and semantics of the C++ programming language.
3	analyze programming problems and design algorithms to solve those problems.

4	identify sequential, selection, and iteration control structures.
5	apply the concepts of structured programming including function usage and parameter passing.
6	apply composite data types such as arrays and structures.
7	demonstrate and understanding of user defined data types such as enumerations and structured data.
8	describe and apply dynamic memory allocation using pointers.
9	identify file input and output.
10	identify good programming practice and style.

Course Content

Lecture/Course Content

12% - Introduction to C++
• What the basic components of a C++ program are
• Using the Integrated Programming Environment
• Preprocessor introduction
• Header files

19% - Lexical Elements, Operators, and the C++ System
• Data types
• Identifiers
• Variables
• Constants
• Operators
• Operator precedence and associativity

18% - Flow of Control
• Relational and boolean operators
• If and switch statements
• While, for, and do/while loops

12% - Functions and Structured Programming
• What functions are
• Writing C++ functions
• Using C++ functions
• Parameter passing (call by value and call by reference)
• Separate compilation
• Structured programming and top-down design
• Scope concepts

3% - Standard Data Types and Enumerated Types
• Input and output of different data types
• Promotion and type casting
• Enumerated types and user defined data types

12% - Pointers
• Indirect addressing
• Dereferencing
• Memory usage
• Parameter passing by address
• Static local variables
• Storage classes
• Type qualifiers
• Dynamic storage allocation
• Relationship between arrays and pointers
• Dynamically allocating arrays

10% - Arrays
• One dimensional arrays
• Two dimensional arrays
• Multidimensional arrays
• Introduction to vectors
• Sorting and searching arrays

9% - Structures
• Declaring structures
• Accessing members
• Self-referential structures

5% - File Input and Output

• Accessing files
• Reading from a file
• Writing to a file

Laboratory or Activity Content

Not applicable.

Methods of Evaluation

Which of these methods will students use to demonstrate proficiency in the subject matter of this course? (Check all that apply):

Written expression
Problem solving exercises

Methods of Evaluation may include, but are not limited to, the following typical classroom assessment techniques/required assignments (check as many as are deemed appropriate):

Objective exams
Problem-solving exams
Skills demonstrations
Classroom Discussion
Projects
Participation

Instructional Methodology

Specify the methods of instruction that may be employed in this course

Distance Education
Laboratory activities
Lecture
Other (specify)

Specify other method of instruction

Introduction of programming concepts with detailed coding examples.
Practice problems to develop proper programming skills and techniques.
Student/instructor interaction using questions and answers.
Projects and/or group work to enhance student understanding of the concepts.

Describe specific examples of the methods the instructor will use:

The instructor will assign written homework exercises and programming assignments requiring students to analyze a problem, determine a solution, implement the solution using a programming language, and test and verify the program.

There may be weekly quizzes (or some other time frame as determined by the instructor) where students will test their knowledge of the material. The instructor may assign exercises through which students explore course concepts using the textbook and additional research. There may also be projects which require students to write programs.

Representative Course Assignments

Writing Assignments

1. Write comments on and critiques of computer programs.
2. Write a paper that describes the basic components, syntax, and semantics of the C++ programming language.

Critical Thinking Assignments

1. Evaluate incorrect programs and/or program fragments to determine what errors occur and correct the syntax and/or semantics of the problems identified.
2. Design and evaluate algorithms to solve problems

Reading Assignments

1. Analyze programming problems in C++ and design algorithms to solve the problems.
2. Read professional publications in addition to the text assignments.

Outside Assignments

Representative Outside Assignments

1. Develop algorithms for programming assignments.
2. Research and apply composite data types that are used in C++ language, such as arrays and structures.

Articulation

C-ID Descriptor Number
COMP 122

Status
Approved

Equivalent Courses at 4 year institutions

University	Course ID	Course Title	Units
Cal Poly Pomona	CS 1280	Introduction to C++	3
UC San Diego	MAE 9	C/C++ Programming	4
Cal Poly San Luis Obispo	CPE/CSC 101	Fundamentals of Computer Science I	4
UC Davis	ENG CS 30	Prog/Prob Solving: C	4

Comparable Courses within the VCCCD
CS V13 - Object-Oriented Programming

District General Education

A. Natural Sciences

B. Social and Behavioral Sciences

C. Humanities

D. Language and Rationality

D2. Communication/Analytical Thinking
Approved

E. Health and Physical Education/Kinesiology

F. Ethnic Studies/Gender Studies

Course is CSU transferable
Yes

CSU Baccalaureate List effective term:
F1996

CSU GE-Breadth

Area A: English Language Communication and Critical Thinking

Area B: Scientific Inquiry and Quantitative Reasoning

Area C: Arts and Humanities

Area D: Social Sciences

Area E: Lifelong Learning and Self-Development

Area F: Ethnic Studies

CSU Graduation Requirement in U.S. History, Constitution and American Ideals:

UC TCA

UC TCA
Approved

IGETC

Area 1: English Communication

Area 2A: Mathematical Concepts & Quantitative Reasoning

Area 3: Arts and Humanities

Area 4: Social and Behavioral Sciences

Area 5: Physical and Biological Sciences

Area 6: Languages Other than English (LOTE)

Textbooks and Lab Manuals

Resource Type
Textbook

Description
Deitel, Paul, and Harvey Deitel (2016). *C++ How to Program* (10th). Pearson. 9780134448237

Resource Type
Textbook

Description
Gaddis Tony (2017). *Starting Out With C++: From Control Structures Through Objects* (9th). Pearson. 9780134498379

Resource Type
Software

Description
Microsoft Visual Studio 2015 Express C++. Microsoft.

Library Resources

Assignments requiring library resources
Using the Library's online databases, research an engineering design project which uses computer programming for simulation.

Sufficient Library Resources exist
Yes

Distance Education Addendum

Definitions

Distance Education Modalities
Hybrid (51%–99% online)
100% online

Faculty Certifications

Faculty assigned to teach Hybrid or Fully Online sections of this course will receive training in how to satisfy the Federal and state regulations governing regular effective/substantive contact for distance education. The training will include common elements in the district-supported learning management system (LMS), online teaching methods, regular effective/substantive contact, and best practices.
Yes

Faculty assigned to teach Hybrid or Fully Online sections of this course will meet with the EAC Alternate Media Specialist to ensure that the course content meets the required Federal and state accessibility standards for access by students with disabilities. Common areas for discussion include accessibility of PDF files, images, captioning of videos, Power Point presentations, math and scientific notation, and ensuring the use of style mark-up in Word documents.
Yes

Regular Effective/Substantive Contact

Hybrid (51%–99% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
E-mail	Instructor will email students with announcements about the course or an upcoming event.
Synchronous Dialog (e.g., online chat)	Instructor may be available on certain day(s) for a certain time frame to help students.
Other DE (e.g., recorded lectures)	Instructor may record the lectures and post them for students to view within a specified time frame to be ready for the accompanying assignment.

100% online Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
E-mail	Instructor will email students with announcements about the course or an upcoming event.
Synchronous Dialog (e.g., online chat)	The instructor may be available on certain day(s) for a certain time frame to help students.
Other DE (e.g., recorded lectures)	Instructor may record the lectures and post them for students to view within a specified time frame to be ready for the accompanying assignment.
Asynchronous Dialog (e.g., discussion board)	Instructor will post a question, students will respond to the question.

Examinations

Hybrid (51%–99% online) Modality
On campus
Online

Primary Minimum Qualification
COMPUTER SCIENCE

Review and Approval Dates

Department Chair
MM/DD/YYYY

Dean
MM/DD/YYYY

Technical Review
MM/DD/YYYY

Curriculum Committee
MM/DD/YYYY

DTRW-I
MM/DD/YYYY

Curriculum Committee
MM/DD/YYYY

Board
MM/DD/YYYY

CCCCO
MM/DD/YYYY

Control Number
CCC000608534

DOE/accreditation approval date
MM/DD/YYYY