CS/IS135 : Programming In C/C++

General Information

Author:	• Tony Biehl
Attachments:	DE Addendum_CS:IS_135 COR_09_01_2020 CoDE_09_26_2023.pdf.pdf
Course Code (CB01) :	CS/IS135
Course Title (CB02) :	Programming In C/C++
Department:	CSIS
Proposal Start:	Fall 2024
TOP Code (CB03) :	(0707.10) Computer Programming
CIP Code:	(11.0201) Computer Programming/Programmer, General.
SAM Code (CB09) :	Clearly Occupational
Distance Education Approved:	No
Will this course be taught asynchronously?:	Yes
Course Control Number (CB00) :	CCC000188864
Curriculum Committee Approval Date:	03/27/2024
Board of Trustees Approval Date:	06/18/2024
Last Cyclical Review Date:	03/27/2024
Course Description and Course Note:	CS/IS 135 is a course in programming using the C/C ++ languages, with uses in applications programming for real time, business, and image processing systems as well as systems programming. Types, operators, control flow functions, object-oriented programming, classes, data abstraction, and program structure pointers and arrays are covered in the programming assignments.
Justification:	Mandatory Revision
Academic Career:	• Credit
Author:	• Tony Biehl

Academic Senate Discipline

Primary Discipline:	• Computer Science
Alternate Discipline:	No value
Alternate Discipline:	No value

Course Development

Basic Skill Status (CB08)

Course is not a basic skills course.

Course Special Class Status (CB13)

Course is not a special class.

Grading Basis

- Grade with Pass / No-Pass Option

☑ Allow Students to Gain Credit by Exam/Challenge

Pre-Collegiate Level (CB21)

Not applicable.

Course Support Course Status (CB26)

Course is not a support course

Transferability & Gen. Ed. Options

General Education Status (CB25)

Not Applicable

Transferability

Transferable to both UC and CSU

Transferability Status

Approved

C-ID	Area	Status	Approval Date	Comparable Course
COMP	Computer Science	Approved	02/17/2015	COMP 122 - Programming Concepts and Methodology I

Units and Hours

Summary

Minimum Credit Units (CB07)	3
Maximum Credit Units (CB06)	3
Total Course In-Class (Contact) Hours	90
Total Course Out-of-Class Hours	72
Total Student Learning Hours	162

Credit / Non-Credit Options

Course Type (CB04)

Credit - Degree Applicable

Noncredit Course Category (CB22)

Credit Course.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Credit Course.

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

☐ Variable Credit Course

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	2	4

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	54

Laboratory Hours	3	0
Studio Hours	0	0

Course In-Class (Contact) Hours	
Lecture	36
Laboratory	54
Studio	0
Total	90

Course Out-of-Class Hours	
Lecture	72
Laboratory	0
Studio	0
Total	72

Time Commitment Notes for Students

No value

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

Prerequisite

CS/IS112 - Introduction To Programming Using Java (in-development)

Objectives

- Examine problems, apply logic, and provide solutions/algorithms for the problems.
- Show the solution/algorithm using flowcharts or pseudocode.

Entry Standards

Entry Standards

Demonstrate understanding of using a computer for programming.

Course Limitations

Cross Listed or Equivalent Course

Specifications

Methods of Instruction

Methods of Instruction	Lecture
Methods of Instruction	Laboratory
Methods of Instruction	Demonstrations

Out of Class Assignments

- Programming assignments (e.g. design/develop an object-oriented program)
- Computer assignments (e.g. hands-on exploration of GUI programming fundamentals)

Methods of Evaluation	Rationale
Exam/Quiz/Test	Final examination
Exam/Quiz/Test	Quizzes
Exam/Quiz/Test	Midterm examinations

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
Gaddis	Starting Out with C++: From Control Structures through Objects	Pearson	2018	978-0134498379

Other Instructional Materials (i.e. OER, handouts)

No Value

Materials Fee

No value

Learning Outcomes and Objectives

Course Objectives

Examine problems, apply logic, and provide solutions/algorithms for the problems.

Recognize programming problems on a function-by-function basis and develop structured/procedural code based on this approach.

Demonstrate an understanding of object-oriented programming concepts and object-oriented design in creating a program.

Program in the C++ language including use of objects, pointers, and structures.

SLOs

Implement object-oriented programming concepts and object-oriented design. Expected Outcome Performance: 70.0

CSIS Computer Programmer - Certificate	Analyze a programming task/problem; based on that analysis, design and implement an object oriented program using multiple classes in a high level language.
ILOs Core ILOs	Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions; cultivate creativity that leads to innovative ideas.
	Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.
CSIS Information Technology Certificate	Demonstrate installing, configuring and maintaining computer and mobile devices, including diagnosing, resolving and documenting common hardware and software.
CSIS Information Technology - A.S. Degree Major	Demonstrate installing, configuring, and maintaining computer and mobile devices, including diagnosing, resolving, and documenting common hardware and software.
CSIS Computer Science - Certificate	Prepare a software project to implement a single scientific, mathematical, business, or technical function.
CSIS Computer Science - A.S. Degree Major	Prepare a software project to implement a single scientific, mathematical, business, or technical function.
CSIS Computer Information Systems	analyze simple business or technical problems relevant to programming, and prepare solutions to them
	demonstrate an understanding of the operations and processes of a computer relevant to programming.
	implement a program in either C/C++ or Java, using objects
MATH Mathematics - AS-T	analyze, synthesize and evaluate theorems in Linear Algebra.
	solve applications in math and science using derivatives, integrals, differential equations and linear algebra.
ILOs General Education	apply techniques of analysis and critical thinking to critique real world and theoretical topics and issues
CSIS Computer Software Technician	demonstrate the ability to independently create, save, modify and print a document using a word processing program and appropriate assistive technology
	write a computer program using either C/C++, Java, or Visual Basic
CSIS Web Development - Certificate	use industry standard tools and techniques to produce, publish and maintain Web sites and Web content.
CSIS Web Development - A.S. Degree Major	use industry standard tools and techniques to produce, publish and maintain Web sites and Web content.

Demonstrate an ability to design, code, and debug basic object-based programs and procedural programs. Expected Outcome Performance: 70.0

CSIS Computer Programmer - Certificate	Analyze a programming task/problem; based on that analysis, design and implement an object oriented program using multiple classes in a high level language.
ILOs Core ILOs	Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions; cultivate creativity that leads to innovative ideas.
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Utilize objects, pointers, and structures to program in the C++ language. Expected Outcome Performance: 70.0

CSIS Computer Programmer - Certificate	Analyze a programming task/problem; based on that analysis, design and implement an object oriented program using multiple classes in a high level language.
ILOs Core ILOs	Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions; cultivate creativity that leads to innovative ideas.
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Additional SLO Information

Does this proposal include revisions that might improve student attainment of course learning outcomes?

No

Is this proposal submitted in response to learning outcomes assessment data?

No

If yes was selected in either of the above questions for learning outcomes, explain and attach evidence of discussions about learning outcomes.

No Value

SLO Evidence

No Value

Course Content

Lecture Content

Introduction to the C/C ++ Language (2 hours)

- Languages before C/C++
- Family of languages
- Procedural vs object-oriented
- Components of the C/C++
- Variables and arithmetic
- Data types
- Operators and expressions

Creating a Program (2 hours)

- Required files
- Input/output
- Formatting
- Functions and scope

Control Flow Statements (6 hours)
- Branching - IF, IF ELSE
- Loops - WHILE and FOR
- Switch
- Break and continue
- Go to and return

Functions and Complex Expressions (6 hours)
- Function arguments, types, and parameters
- Scope rules
- Recursion
- Compound assignments
- Operator precedence

Arrays (4 hours)
- Single and multidimensional
- Declaration, reference, store and initialize
- Use of arrays in string processing

Pointers (3 hours)
- Pointers and addresses
- Syntax and use of pointer operator
- Pointers and arrays
- Pointers to functions

Data Structures and Classes (4 hours)

Introduction to Object-Oriented Programming (6 hours)

Input and Output (3 hours)
- Standard I/O
- Formatted I/O
- File I/O

Total hours: 36

Laboratory/Studio Content

Labs (54 hours)
- if
- if-else
- switch
- while
- for
- Methods
- Single Dimensional Arrays
- Multi-dimensional Arrays
- Pointers
- Files
- Object and Classes

Total hours: 54

Additional Information

Is this course proposed for GCC Major or General Education Graduation requirement? If yes, indicate which requirement in the two areas provided below.

Yes

GCC Major Requirements

No Value

GCC General Education Graduation Requirements

Communication and Analytical Thinking

Repeatability

Not Repeatable

Justification (if repeatable was chosen above)

No Value

Resources

Did you contact your departmental library liaison?

No

If yes, who is your departmental library liason?

No Value

Did you contact the DEIA liaison?

No

Were there any DEIA changes made to this outline?

No

If yes, in what areas were these changes made:

No Value

Will any additional resources be needed for this course? (Click all that apply)

- No

If additional resources are needed, add a brief description and cost in the box provided.

No Value