Passaic County Community College
Academic Year: 2023-2024
Standard Syllabus

Department Chair: Merille Siegel

Course Code: CIS 160 **Course Title:** Fundamentals of Computer Science I

Department: CIS/Engineering **Semesters Offered:** Fall Day, Spring Evening

Course Description: This course provides students with an introduction to fundamental computer science concepts, including the process of developing algorithms to solve problems, and the corresponding process of developing C++ programs to express those algorithms. Modern programming paradigms and techniques are stressed in the design and implementation of problems solution. Extensive programming activities emphasize the following topics: data types, operators, selection, repetition, data files, functions, overloading, structures, and object abstraction.

Prerequisites: CIS 108; (In addition to CIS 108, CIS 107 is recommended for students with no computer background)

Credits: 4 **Lecture Hours:** 4 **Lab/Studio Hours:** 0 **Clinical/Fieldwork Hours:** 0

Required Textbook/Materials:

Textbooks: "Starting Out with C++ - Early Objects"; 10th Edition; T. Gaddis/J. Walters/ G. Muganda; Pearson ; 2020. ISBN-13: 978-0-13-523500-3.

Reference: "**A First Book of C++", 4th Edition**;Gary J. Bronson; G. Bronson, Course Technology, Cengage Learning. ISBN-10: 1111531005; 2012

Additional Time and Supplemental Requirements:

Based on a 15 week semester, students are expected to spend an additional 8 hours per week working on this course.

Special Facilities/Equipment:

- Hardware: WinTel Platform PC or lab top.
- Software: Any modern C++ compiler (**wxDev-C++** is a free integrated development environment (IDE) that is based on the popular Dev-C++.).
- Storage Media: Flash Drive for saving projects/homework.

Course Learning Outcomes:

Upon completion of this course, students will be able to:

1. Demonstrate knowledge in understanding the application development cycle.
2. Self-design an algorithm/flowchart to solve a defined problem.
3. Apply programming skills utilizing the C++ language in problems solutions.

4. Demonstrate skills in the use of statements that implement various logic patterns.
5. Utilize procedural programming techniques in problems solutions.
6. Begin to utilize object oriented paradigms in problems solution.
7. Develop well documented and tested applications utilizing the C++ language.
8. Modify existing C++ source program insuring they produce correct results.
9. Demonstrate knowledge in understanding the application development cycle.
10. Self-design an algorithm/flowchart to solve a defined problem.
11. Apply programming skills utilizing the C++ language in problems solutions.
12. Demonstrate skills in the use of statements that implement various logic patterns.
13. Utilize procedural programming techniques in problems solutions.
14. Begin to utilize object oriented paradigms in problems solution.
15. Develop well documented and tested applications utilizing the C++ language.
16. Modify existing C++ source program insuring they produce correct results.

General Education Outcomes:

Upon completion of this course, students will be able to:

GE4-2. Produce a computer program to implement a self-designed algorithm

Grading Standards:

Activity	Contribution
Lab Projects (4 – 6)	30%
Tests/ Quizzes	35%
Final Exam	30%
Attendance/Activities/Etc.	5%

Course Content:
(Schedule and suggested topics, readings, and assignments subject to change based on instructor and instructional resource)

WEEK	TOPIC	Chapter
1	**Introduction to computers and Programming:** Computer systems: (hardware and Software), Programs and programming languages, the programming process, Procedural and Object-Oriented Programming	1
2	**Introduction to C++:** The Parts of a C++ Program, The # include Directive, The cout Object, Comments, Data Types and memory size, Identifiers, Variables, Constants, Variable, assignments and Initialization, Arithmetic Operators	2
3	**Expressions and Interactivity:** The cin Object, Mathematical Expressions, Type Conversion, Overflow and Underflow, Formatting Output.	3

4	Working with Characters and String Objects, Mathematical Library Functions, Introduction to text Files. Debugging: Hand Tracing a Program	3
5(Test 1)	**Functions:** Modular Programming, Declaring, Defining and Calling Functions, Sending Data into a Function, by Value, by reference.	6
6	The return Statement, Scope, Default Arguments, Overloading Functions, function templates.	6
9	**loops:** Introduction: Counters, accumulators, initializations, Increment/Decrement Operators, the while, do-while, for, and introducing recursive functions.	5
10(Test 3)	Sentinels, prompt controlled loops, Input Validation, Deciding Which Loop to Use, Nested Loops, the break and continue Statements	5
11	**Introduction to Classes and Objects:** **Structures:** Data Members, Initializing, input/output, nested Structures, Structures as Function Arguments,	7
12	Returning a Structure from a Function, Abstract Data Types, the **typedef** Statement.	
13(Test 4)	**Object-Oriented Programming:** **Classes:** Definitions, Data members, member functions, Constructors, Destructors, Objects, Defining Member Functions, Overloading, Using .h files.	7
14	Object oriented analysis and design, Intro to UML class diagrams. Creating a multi-file project.	
15	**Final Exam** (final project is Due)	

College Policies:

For Information regarding:

- PCCC's Academic Integrity Code
- Student Conduct Code
- Student Grade Appeal Process

Please refer to the PCCC Student Handbook and PCCC Catalog

Panther Alert:

The College will announce delayed openings, closings, and other emergency situations through the Panther Alert System. Students are encouraged to sign up for Panther Alert Notifications by logging into their student accounts through the PCCC website at www.pccc.edu and following Panther Alert System instructions.

Notification for Students with Learnings Disabilities:

If you have a disability, and believe you need accommodations in this class, please contact the Office of Accessibility Services at 973-684-6395, or email ods@pccc.edu. You should do so as soon as possible at the start of each semester. If you require testing accommodations, you must remind me (the instructor) one week in advance of each test.