CSIT 163: INTRODUCTION TO PROGRAMMING USING C++

1. Course Information

Subject
CSIT - Computer Science/ Information Technology

Course Number
163

School
Science, Technology, Engineering, Mathematics

Course Title
Introduction to Programming Using C++

2. Hours

Semester Hours
4.00000

Lecture
4

Lab
0

Practicum
0

3. Catalog Description

For display in the online catalog
This course introduces the student to the fundamental techniques used in the development of software applications. The course teaches basic programming concepts and principles using C/C++. Students will learn good programming practices in an integrated and interactive software development environment. The topics covered include classes, objects, algorithms, data types, control structures, one-dimensional arrays, attributes, and methods. Working knowledge of windows required. Open lab time required.

4. Requisites

Prerequisites
MATH 023 with grade of C or higher, or Mathematics placement requiring no remediation. ENGL 095 with grade of C or higher, or English placement requiring no remediation.

Corequisites
None

5. Course Type

Course Fee Code
3

Course Type for Perkins Reporting
vocational (approved for Perkins funding)

6. Justification

Describe the need for this course
This is a course that will satisfy a General Education technology requirement.
This course addresses two key topics addressed by the Association for Computing Machinery (ACM).
i. Finding new and better ways of teaching programming
ii. Trying to place computing in a context that would serve to motivate and inspire students

7. General Education

Will the college submit this course to the statewide General Education Coordinating Committee for approval as a course, which satisfies a general education requirement?

Yes

General Education Category

Technology

General Education Status

Approved

8. Consistency with the Vision and Mission Statements, the Academic Master Plan, and the strategic initiatives of the College

Please describe how this course is consistent with Ocean County College's current Vision Statement, Mission Statement, Academic Master Plan, and the strategic initiatives of the College:

	Add item
1	Demonstrating the college's commitment to offer comprehensive educational programs that develop intentional learners of all ages. (Mission Statement)
2	Seeking to ensure that students will thrive in an increasingly diverse and complex world. (Vision Statement)
3	Preparing students for successful transfer to other educational institutions and/or for entrance into the workforce. (Academic Master Plan)
4	Seeking to empower students through the mastery of intellectual and Practical Skills. (Academic Master Plan)
5	Challenging students to transfer information into knowledge and knowledge into action. (Academic Master Plan)

9. Related Courses at Other Institutions

Comparable Courses at NJ Community Colleges

Institution

Essex County College

Course Title

Computer Science I

Course Number

CSC121

Number of Credits

4

Comments

C++

Institution

Rowan College of South Jersey

Course Title

Programming in C++

Course Number

CSC-205

Number of Credits

4

Institution

Passaic County CC

Course Title
Fundamentals of Computer Science II

Course Number
CIS-161

Number of Credits
4

Comments
C++ used.

Transferability of Course

Georgian Court University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
CS123 Computer Programming I, 4 credits	Elective	

Kean University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
CPSX1003, Computer Science Elective, 4 Credits	Elective	

Monmouth University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
CS175 Introduction to Computer Science I, 4 credits	Major	

Rowan University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
CS04103 Computer Science and Programming	Major	

Rutgers - New Brunswick, Mason Gross School of the Arts

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
Elective Credit 4 credits	Elective	

Stockton University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
CSIS2101 Programming and Problem Solving I 4 credits	Major	

10. Course Learning Outcomes

Learning Outcomes

	Students who successfully complete this course will be able to:
CLO1	Identify the steps required in problem solving using C++.
CLO2	Identify the properties of an algorithm.
CLO3	Differentiate between an algorithm and a computer program.
CLO4	Identify the basic data types available in C++.
CLO5	Design, code, test and debug simple programs written in an object-oriented language.
CLO6	Write programs that use conditional control structures and methods.
CLO7	Write programs in C++ utilizing repetition structures and methods.
CLO8	Apply the technique of decomposition in program construction.

CLO9	Differentiate between a void method and one that returns a value.
CLO10	Construct and manipulate one-dimensional arrays.

11. Topical Outline

(include as many themes/skills as needed)

	Major Themes/ Skills	Assignments (Recommended but not limited to)	Assessments (Recommended but not limited to)	Course Learning Outcome(s)
TO1	Introduction to Computers and Programming 1) History of Computers and Programming Languages 2) How to set up the C++ Programming Environment 3) Using an Integrated Development Environment (IDE)	In-class exercise	Programming Exercises Exam	CLO1,CLO2,CLO3
TO2	Problem Solving and Algorithms 1) Problem Solving Techniques 2) Algorithms 3) Decomposition	In-class exercise	Programming Exercises Exam	CLO1,CLO2,CLO3
TO3	Data Representation 1) Data Types 2) Identifiers 3) Arithmetic Operations 4) Variable and Declaration Statements 5) Data Type Conversions 6) Assignment Statements	In-class exercise	Lab assignment	CLO4
TO4	Programming by Example 1) Simple keyboard input 2) Simple console output 3) Formatting output	Hands-on, Lab exercises	Programming Exercises	CLO5
TO5	Using common Library Classes 1) Math Library 2) String Class 3) Reading and using the C++ API	Hands-on	Programming Exercises	CLO5
TO6	6. Selection Structures 1) Selection Criteria - Relational and Logical Operators 2) One and Two-way Selection 3) Multi-way Selection 4) Compound Conditions 5) Problem Solving - Data Validation	Hands-on & Lab Exercises	Programming Exercises Exam	CLO6
TO7	Repetition Structures 1) Pre-test Loops 2) Post-test Loops 3) Counter Loops 4) Interactive Loops 5) Nested loops	Hands-on & Lab Exercises	Programming Exercises Exam	CLO7
TO8	Methods 1) Creating methods 2) Invoking methods 3) Passing parameters 4) Returning Values	Hands-on & Lab Exercises	Programming Exercises Exam	CLO8,CLO9
TO9	Arrays 1) Creating arrays 2) Examples 3) Using arrays in a loop	Hands-on & Lab Exercises	Programming Exercises Exam	CLO10

12. Methods of Instruction

In the structuring of this course, what major methods of instruction will be utilized?

o Class lecture
o Discussion
o Demonstrations
o Lab assignments
o Programs and online presentations

13. General Education Goals Addressed by this Course (this section is to fulfill state requirements)

Information

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Technological Competency

Yes

Related Course Learning Outcome

CLO2,CLO4-CLO10

Related Outline Component

TO2-TO9

Assessment of General Education Goal (Recommended but not limited to)

Programming Exercises
Exam

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_____

Independent/Critical Thinking

Yes

Related Course Learning Outcome

CLO1,CLO2

Related Outline Component

TO1,TO2

Assessment of General Education Goal (Recommended but not limited to)

Programming Exercises
Exam

14. Needs

Instructional Materials (text etc.):

Appropriate textbooks and/or open educational resources will be selected. Contact the department for current adoptions. Class notes, presentations, software and online materials.

Technology Needs:
College Portal and/or College Distance Learning Platform and/or Textbook or Instructor Website.

Human Resource Needs (Presently Employed vs. New Faculty):
Four (4) presently employed full-time faculty plus additional Adjunct Professors as needed.

Facility Needs:
Laboratory classrooms equipped with computer workstations, each configured to support program development using C++. Podium computer similarly equipped plus the ability to present audio-video presentations to the class.

15. Grade Determinants

The final grade in the course will be the cumulative grade based on the following letter grades or their numerical equivalents for the course assignments and examinations

A: Excellent

B+: Very Good

B: Good

C+: Above Average

C: Average

D: Below Average

F: Failure

I: Incomplete

R: Audit

For more detailed information on the Ocean County College grading system, please see Policy #5154.

16. Board Approval

History of Board approval dates
Board of Trustees Approval Date: February 28, 2019
Board of Trustees Approval Date: April 23, 2020