

CSIT 166: PROGRAMMING II

1. Course Information

Subject

CSIT - Computer Science/ Information Technology

Course Number

166

School

Science, Technology, Engineering, Mathematics

Course Title

Programming II

2. Hours

Semester Hours

4.00000

Lecture

3

Lab

1

Practicum

0

3. Catalog Description

For display in the online catalog

This course continues the study of software development using the Java programming language. The course extends the development and growth of object-oriented paradigms through discussions of patterns, use of Unified Modeling Language (UML), and case studies. Students shall develop proficiency in debugging and test-driven development. Additional topics include files, arrays, collections, enumeration, recursion, sorting and searching. Open lab time required.

4. Requisites

Prerequisites

CSIT165 with a grade of C or better

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 required course for all AS and AAS Computer Science programs, many Engineering programs, and many Information Technology certificates. The course resolves the need for good problem-solving skills.

This course also addresses two key topics identified 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

AS Computer Science:

- Recognize the problems involved in program portability and be able to identify the solutions to these problems.
 - Describe the software life cycle.
 - Discuss the rationale and implement both member and friend examples of operator overloading.
 - Explain the benefits of derived classes (including private, protected and public data members and methods) and implement examples of derived classes.
 - Demonstrate independent thinking through mathematical, scientific and philosophical reasoning.
 - Solve problems by collecting, organizing and evaluating information.
- AAS Computer Science/Information Technology:
- Discuss the rationale and implement both member and friend examples of operator overloading.
 - Explain the benefits of derived classes (including private, protected and public data members and methods) and implement examples of derived classes.

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?

No

If the course does not satisfy a general education requirement, which of the following does it satisfy:

Program-specific requirement

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	Offer comprehensive educational programs that develop intentional learners of all ages and ensure the full assessment of student learning in these programs. (Mission Statement)
2	Foster educational innovation through effective teaching-learning strategies, designed to develop and nurture intentional learners who are informed and empowered. (Vision Statement)
3	Employ technology and learning outcomes assessment to ensure student success in an increasingly diverse and complex world. (Vision Statement)
4	Prepare students for entrance into the workforce and/or for successful transfer to other educational institutions. (Academic Master Plan)
5	Seek to empower students through the mastery of intellectual and Practical Skills. (Academic Master Plan)
6	Challenge 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

Atlantic Cape CC

Course Title

Advanced Computer Programming-Java

Course Number

CSIM254

Number of Credits

4

Comments

Requires CSIM154 Computer Programming-Java

Institution

Brookdale CC

Course Title

Programming II

Course Number

Comp271

Number of Credits

3

Comments

Requires COMP-126 Computer Logic and Design (3 credits)

Institution

Rowan College at Burlington County

Course Title

Introduction to Java

Course Number

CSE151

Number of Credits

3

Institution

Camden County College

Course Title

Advanced Java

Course Number

CSC262

Number of Credits

3

Comments

Requires CSC161

Institution

Mercer County CC

Course Title

Computer Science I – Algorithms & Programming

Course Number

COS102

Number of Credits

4

Comments

Requires COS101

Institution

Middlesex County College

Course Title

Object Oriented Programming Using Java

Course Number

CSC161

Number of Credits

4

Transferability of Course**Georgian Court University**

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
CS126 Computer Programming II 4 credits	Major/Minor	

Kean University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
CPS 2231 Computer Organization & Programming 4 credits	Major	

Monmouth University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
CS176 Introduction to Computer Science II 4 credits	Major	

Rowan University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
CS 04.114 Object Oriented Programming and Data Abstraction 4 credits	Major	

Rutgers - New Brunswick, Mason Gross School of the Arts

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
		Will not transfer

Stockton University

Course Code, Title, and Credits	Transfer Catagory	If non-transferable; select status
CSIS2102 Programming and Problem Solving II 4 credits	Major	

If not transferable to any institution, explain:

There is no known course on the Rutgers New Brunswick campus to which transfer credit will be given.

10. Course Learning Outcomes**Learning Outcomes**

Students who successfully complete this course will be able to:	
CLO1	Discuss Object-Oriented concepts and techniques of how to read and create UML diagrams; how to create Javadoc documentation, and how to debug programs using Integrated Development Environment (IDE)
CLO2	Define and write programs that use the concepts of Inheritance, Polymorphism, Abstract Classes, Interfaces, generics and enumeration types
CLO3	Write programs that use file Input/Output (I/O) facilities and that use Exception Handling capabilities
CLO4	Write programs that use tables
CLO5	Write programs that use sequential and binary search algorithms and common quadratic sorting algorithms
CLO6	Examine programs that use basic Collections Classes.
CLO7	Examine programs that use recursion

CLO8	Demonstrate critical thinking skills through the analysis, design, implementation and documentation of real world problems in an object-oriented language
CLO9	Design, code and test simple event-driven Graphical User Interface (GUI) applications in Java.

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)
T01	Review of Fundamental Language Constructs	Hands-on	None	CLO1
T02	UML 1) Reading and creating structure diagrams - Class Diagrams, Component Diagrams and Object Diagrams 2) Reading and creating behavior diagrams – Activity Diagrams and Use Case Diagrams	In-class exercise	None	CLO1
T03	Javadoc 1) Reading and using Javadoc for new and unfamiliar classes 2) Creating Javadoc to document programs	In-class exercise	None	CLO1
T04	Object-Oriented Details 1) Object Interaction 2) Inheritance and Polymorphism 3) Virtual classes and Interfaces 4) Describe generics and enumeration types	Hands-on; Lab exercises	Programming Exercises; Exam	CLO1,CLO4,CLO7,CLO9
T05	Debugging and Error Handling 1) How to use the debugging facility 2) Using the try/catch exception handling constructs 3) Creating and catching user-created Exception classes	Hands-on; Lab exercises	Programming Exercises; Exam	CLO1,CLO3
T06	Files and Streams 1) Creating and processing Sequential-Access Files 2) Exception Handling 3) Creating and reading objects 4) Serialization of Objects	Hands-on; Lab exercises	Programming Exercises; Exam	CLO3
T07	Array Processing 1) Text Processing 2) Tables 3) Unordered lists 4) Ordered lists	Hands-on; Lab exercises	Programming Exercises; Exam	CLO2
T08	Searching and Sorting 1) Sequential and binary search algorithms 2) Quadratic sorting algorithms	Hands-on; Lab exercises	Programming Exercises; Exam	CLO5,CLO6
T09	Collections 1) Overview 2) Methods 3) Interface	Hands-on; Lab exercises	Programming Exercises; Exam	CLO6

T010	Recursion 1) Concepts and Implementation 2) Examining classic examples: factorial, Fibonacci, Towers of Hanoi	Hands-on; Lab exercises	Programming Exercises; Exam	CLO8,CLO9
T011	Graphical User Interfaces 1) Concepts of Event Driven Programs 2) Write simple Graphical User Interface (GUI) applications in Java	Hands-on; Lab exercises	Programming Exercises; Exam	CLO9

12. Methods of Instruction

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

Class lecture, discussion, demonstrations, lab assignments, programs and online presentations.

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

Information

Technological Competency

Yes

Related Course Learning Outcome

CLO1-CLO9

Related Outline Component

T01-T011

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

Mastering the basic skills necessary to take written specifications and turn them into a functional and well organized computer program. Knowledge of programming methods, practices and paradigms.

Independent/Critical Thinking

Yes

Related Course Learning Outcome

CLO1-CLO9

Related Outline Component

T01-T011

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

Mastering the basic skills necessary to take a problem statement and turn it into a functional algorithm

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):

Presently employed

Facility Needs:

Laboratory classrooms equipped with computer workstations, each configured to support program development using Java. 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, 2011

Board of Trustees Approval Date: March 26, 2012

PLT Approval of Form: May 22, 2012

Board of Trustees Approval Date: November 3, 2014

PLT Approval of Form: October 28, 2014

Approval of Form: September 2017

Board of Trustees Approval Date: March 26, 2020