

CUMBERLAND COUNTY COLLEGE

Course: CS 112 Computer Science II

Credits: 4

Prerequisites: CS 111 or permission of instructor

Description:

This course introduces students to programming and problem solving using an object-oriented programming language. Algorithm development and basic problem solving techniques are introduced. Fundamental topics of computer programming including sequence, selection, repetition, input/output, functions, parameter passing, classes, scope, lifetime, and arrays are introduced and explored through discussion and lab experiences. The course emphasizes good software engineering principles and fostering fundamental programming skills in the context of a language that supports the object-oriented paradigm.

Learning Outcomes

At the completion of this course, students will be able to:

- Design, code, edit, debug, and run computer programs.
- Develop programs using classes and object-oriented design.
- Develop algorithms through the process of top-down, stepwise refinement.
- Develop programs using sequence, selection and repetition to control program logic.
- Model and encapsulate data in programs using arrays and other data structures.
- Identify and apply principles and techniques for object-oriented software design and development.

Topical Outline

Objects & Classes

--Defining Classes

--Methods, Parameters, Data Types

Class Definition

--Fields, Constructors

--Accessors, Mutators

--Assignment, Conditionals

--Scope: Fields, Parameters, Local Variables

Object Interaction

- Class Diagrams
- Primitive vs Reference types
- String concatenation, Number formatting
- Modulus operator
- Method calls... the this keyword
- Using a debugger: step, breakpoints

Collections topics

- ArrayList, Iterator
- Looping

Documentation topics: api, javadoc

Using Lists and Maps

Designing classes

- responsibility
- coupling and cohesion
- code duplication [reduce it!]
- refactoring

Unit Testing

- junit testing

Inheritance

superclass, subclass, extends, is-a relationship, inheritance hierarchy, abstract class, subtyping, substitution, polymorphic variables, super constructor, cast, Object class, wrapper classes

Text:

David J. Barnes and Michael Kolling, *Objects First with Java: A Practical Introduction Using BlueJ*, 5th Edition, Prentice Hall/Pearson Education, 2012.
ISBN 978-0-13-249266-9

Student Assessment

(Assessment may be accomplished through projects, portfolios, exams, presentations and/or papers).

Academic Integrity

Plagiarism is cheating. Plagiarism is presenting in written work, in public speaking, and in oral reports the ideas or exact words of someone else without proper documentation.

Whether the act of plagiarism is deliberate or accidental [ignorance of the proper rules for handling material is no excuse], plagiarism is, indeed, a “criminal” offense.

As such, a plagiarized paper or report automatically receives a grade of **ZERO** and the student may receive a grade of **F** for the semester at the discretion of the instructor.

Tutoring & Project Assist

If you are having difficulty with work in this class tutoring is available through the Center for Academic & Student Success. If you think that you might have a learning disability, contact Project Assist at 856.691.8600 x 1282 for information on assistance that can be provided to eligible students.

Before Withdrawing From This Course

If a student experiences adverse circumstances while enrolled in this course and considers withdrawing, s/he should see an advisor (division or advisement center) **BEFORE** withdrawing from the class. A withdrawal may cause harmful repercussions to completion rate standards and overall GPA which can limit or eliminate future financial aid in addition to causing academic suspension.