

Departmental Syllabus

Prepared by the Department of Mathematics

Date of Departmental Approval: April 10, 2017

Date approved by Curriculum and Programs: April 12, 2017

Effective: Fall 2017

1. Course Number: CSC110

Course Title: Computer Programming I: JAVA

2. Description: In this introduction to the field of computer science, students use projects and teamwork to design, implement, and test programs in Java. Programming style, expression, and documentation are emphasized. Object-oriented programming methodology, graphical user interfaces, debugging techniques, string processing, and arrays are covered. Java provides an introduction to programming for students in any academic discipline.

3. Student Learning Outcomes (instructional objectives, intellectual skills):

Upon successful completion of this course, students are able to do the following.

- Develop algorithms and solve problems with Java.
- design, code, debug, test, and document programs using predefined and programmer-defined methods and classes, formatting, casting, constructors, overloaded methods, get/set methods, primitive and reference variables, logical and relational operators, random number generators, decision statements, loops, and arrays.
- Apply consistent documentation and program style standards that contribute to the readability and maintainability of software.
- Identify and code with legal Java identifiers, variable names, arithmetic and Boolean expressions, comments, data types, methods (including constructors), objects, and classes.
- Determine scope of variables and effect of access modifiers.
- Create interactive programs with appealing GUIs which utilize components, graphics, simple media files, listeners, and layout managers.
- Convert between conditional and unconditional loops and between various decision statements.
- Choose appropriate loops, decision statements, and Java API class hierarchies given program specifications.
- Utilize predefined string methods to examine string literals and user-input strings.
- Process data in one-dimensional array, use sequential search with parallel arrays, and sort one-dimensional array on different keys.
- trace simple recursion

4. Credit(s): 3 credits

5. Satisfies General Education Requirement: No

6. Prerequisite(s): MAT035 (Algebra for Non-STEM) or satisfactory basic skills assessment score

7. Semester(s) Offered: Fall, Spring

8. Suggested General Guidelines for Evaluation: Homework, group projects, programs, quizzes, midterm, final.

9. General Topical Outline:

1. Introduction to Computers/History of Languages
2. Algorithm Development
3. Standard Classes and Methods
4. Elements of a Program
 - a. Program Variables
 - b. Assignment Statements
 - c. Data Types
 - d. Arithmetic Expressions

- e. Input and Output
 - f. Name Identifiers
 - g. Constants
 - h. Comments
5. Testing and Debugging
 - a. Tracing Programs
 - b. Using Debugger
 - c. Junit Tests
 6. Simple Branching
 - a. Boolean Expressions
 - b. if statements
 - c. switch statements
 7. Simple Graphics and GUIs
 8. Primitive and Reference Parameters
 9. Scope of Variables
 10. Loops (while, do-while, for)
 - a. Preconditions and Postconditions
 - b. Problem Solving Using Loops
 11. Inheritance and Interfaces
 12. Events and Actions
 13. Arrays
 - a. One Dimensional Arrays (in depth)
 - b. Arrays of Arrays (brief)
 14. Strings