Rhode Island College
COMPUTER SCIENCE 201: COMPUTER PROGRAMMING I

CATALOG DESCRIPTION
Fundamentals of programming and algorithm development are taught using an object-oriented language such as Java. Topics include classes, control structures, arrays, inheritance, and graphical user interfaces. Lecture and laboratory.

PURPOSE
This course introduces the basic methodology of object-oriented algorithm design and programming with an emphasis on developing good programming style. This course is currently taught using the Java programming language.

MAJOR TOPICS
Basic Java concepts, basic I/O, classes and methods, control structures, one-dimensional arrays, inheritance, polymorphism and graphical user interfaces.

APPROACH
This course should introduce the basic concepts of object-oriented programming. Emphasize the development of programs by using object oriented design including code reuse through the use of inheritance and polymorphism. Students should be required to design and run five or six programming projects illustrating important programming concepts. View this course as a programming course that happens to use Java rather than a course in Java syntax. However, a good understanding of elementary Java programming must be obtained from this course since Java is currently the central language of the computer science major.

LABORATORY
This course has a weekly one-hour laboratory lesson, scheduled in a computer lab. Laboratory projects should give the student additional experience designing, testing, and debugging code. The laboratory projects may also explore topics beyond those covered in the lectures.

CLIENTELE
This course is required in the computer science major, the computer science minor, and the secondary education major in mathematics, and is an elective in the computer information systems minor. Most students will have had some previous computer experience, but may not have had any programming experience.

PREREQUISITE
Three units of college preparatory mathematics or Mathematics 120.

Course Outline for CS 201: Computer Programming I

Basic Java Concepts
Expressions: Data Types, variables, operators, order of operations — 1 week

Basic I/O such as *JOptionPane, printf and scanner* — 0.5 weeks

Classes and Methods — 2 weeks
- Constructors and object instantiation
- Instance variables, methods, parameters
- public and private access, local variables

Control Structures
- Selection: *f* [*else*] statement — 1 week
- Iteration: *while* and *for* statement — 2 weeks
  - Summing, Counting loops, use of sentinels
  - Finding Max or min

One-Dimensional Arrays — 1.5 weeks

Object-Oriented Programming
- Inheritance: Extension classes and interfaces — 1 week
- Polymorphism: Method overriding and Dynamic binding of methods — 1 week

Graphical User Interfaces
- Drawing Graphics:[with *Java2d*]: Lines, rectangles, ellipses, colors, and fonts — 1 week
- Interacting with the User[with *Swing*]: Event handling, one Layout Manager and Controls [Buttons, text fields and labels — 2 weeks

Testing and Review — 1 week

Total — **14 weeks**