

CS 1110. Introduction to Computing using Java

Credit: 4 hours

Prerequisites: Basic high school mathematics (no calculus) but no programming experience.

Catalogue description: Programming and problem solving using Java. Emphasizes principles of software development, style, and testing. Topics include object-oriented concepts, procedures and functions, recursion, iteration, arrays, strings, algorithms, exceptions, GUIs (graphical user interfaces). Weekly labs provide guided practice on the computer, with staff present to help. Assignments use graphics and GUIs to help develop fluency and understanding.

Required or elective: Common-curriculum course: one of CS 1110–1114 is required.

Textbook(s) and other required materials:

1. Gries, D., and Gries, P. *ProgramLive: A Multimedia Introduction to Programming using Java*. Springer Verlag, 2004.
2. DrJava, a free development environment for Java, Computer Science Department, Rice University. Obtain at <http://drjava.sourceforge.net>.

Course objectives:

The primary goal of CS1110 is to give students a basic introduction to object-oriented and procedural programming, using Java.

Topics covered:

Objects and classes, including subclasses, inheritance, and overriding
Primitive types and class types
Methods (procedures, functions, constructors), including recursion
Basic statements: assignment, if-statements, loops, blocks, method calls
Arrays
Simple I/O —reading and writing files
Testing and debugging
Program development —stepwise refinement (top-down design) and object-oriented design
Basic searching and sorting algorithms
A model of execution
Programming style considerations

Class/laboratory schedule:

Two 50-minute lectures per week.
One 50-minute lab per week

Contribution of course to meeting the professional component:

This course contributes to item (a) of the professional component (one year of a combination of college level mathematics and basic sciences appropriate to the discipline) and to item (b) engineering design.

Course outcomes and their relation to ABET program outcomes a-k:

1. Understand OO concepts, as used in Java: classes, subclasses, inheritance, and overriding. This includes an operational model of method calls. Understand the basics of OO design. (a, b, c, k)
2. Be fluent in the use of procedural statements —assignments, conditional statements, loops, method calls (including recursion)— and one-dimensional arrays. Be able to design, code, and test small Java programs that meet requirements expressed in English. This includes a basic understanding of top-down design. (a, b, c)
3. Have knowledge of basic searching and sorting algorithms. (k)

Assessment of course outcomes

Course outcomes will be assessed by examination (midterm tests and a final) and student-submitted homework and programming assignments.

Person preparing this description and date:

David Gries, 1 October 2003, revised 20 February 2008, 6 June 2008, 3 August 2010.

Ethical behavior statement:

We ask you not to cheat, in any way, shape, or form. In return, we will try our best to be fair about the amount of work we are giving you, in the grading of that work, and in giving you a course grade. You can always talk to us if you have a gripe or criticism about the course, and we will attempt to respond to it immediately.

You must submit only work that you yourself did. Using a computer does not modify the standards of academic integrity stipulated in the Cornell University code of conduct. You may discuss work with other students. However, cooperation should never involve other students possessing a copy of all, or a portion of, your work regardless of format. You cannot remove your partner's name from an assignment unless you do not use each other's work.

We assign penalties on a case-by-case basis. We may lower your grade, fail you in CS100, request Cornell University disciplinary action, and/or apply a permanent mark on your transcript.

For more information, see the following pages on academic integrity:

Computer Science web page: www.cs.cornell.edu/ugrad/AcadInteg.html

Cornell web: cuinfo.cornell.edu/Academic/AIC.html.

Explanation of Academic Integrity processes: www.theuniversityfaculty.cornell.edu/AcadInteg/