

# Introduction to Computer Science

## CSC 111

### Course Syllabus

Fall 2017

**Instructor:** Dr. Grey Ballard

**Email:** ballard@wfu.edu

**Office:** Manchester 234

**Office Hours:** WF 3–4:30, or by drop-in or appointment

**Teaching Assistant:** Sydney Packard

**Class:** 11–12:15 MWF, Manchester 229

**Text:** Programming in Java (zyBook)

**Course Schedule:** <http://users.wfu.edu/ballard/teaching/CSC111/>

## 1 Course Description

Introduction to the basic concepts of computer programming and algorithmic problem solving for students with little or no programming experience. Recommended as the first course for students considering a major or minor in computer science; also appropriate for students who want computing experience applicable to other disciplines.

## 2 Course Learning Objectives

In this course, students will learn the fundamentals of computational problem-solving. They will learn how to write logical sequences of statements that constitute an algorithm. They will develop algorithms and implement them in a particular programming language (in this case, Java). As they write programs, students will learn how to use variables, constants, assignment statements, conditions, loops, input and output statements, arrays, functions, objects, classes, and inheritance. They will learn to write programs that use both textual and graphical user interfaces. Students will also gain experience with an integrated development environment (an IDE) – the programming environment that provides them with an editor, compiler, run-time environment, debugger, and plugins. They will learn how to write, compile, and debug programs in the given

IDE (in this case IntelliJ). By the end of the semester, students will be able to develop and implement algorithms to solve simple to moderately difficult problems.

### **3 Course Topics**

#### **Problem Solving**

- The concept of an algorithm
- Algorithmic problem-solving and problem-solving strategies
- Structured decomposition and top-down design
- Debugging strategies
- Introduction to unit testing

#### **Fundamental Constructs**

- Basic syntax and semantics of a higher-level language, Java
- Variables, types, expressions, and assignment statements
- Simple input and output
- Conditional and iterative control structures
- Recursion
- Functions and parameter passing
- Scope of identifiers
- Call by value vs. call by reference

#### **Data Representation, Data Types, and Data Structures**

- Binary and hexadecimal base systems
- Primitive types such as character, integer, and floating point numbers
- Arrays (1D and 2D) and array lists
- Strings and string methods
- References

#### **Event Driven Programming**

- Introduction to event-driven programming
- Call backs and action listeners

## Object-Oriented Programming

- Introduction to object-oriented design
- Classes and objects and an introduction to inheritance
- Encapsulation, data protection, and information-hiding
- Separation of interface and implementation

## Other Topics

- The compile/link/run process
- Types of errors:
  - compiler vs linker
  - syntax vs logical vs run-time
- Introduction to exception handling
- Introduction to GUI-building
- Introduction to memory management (e.g., garbage collection, run-time storage management)
- Virtual machine and bytecode interpretation

## Tools and Skills

- How to use an IDE effectively, including the debugger
- How to use libraries and APIs, including their documentation
- File structure fundamentals (directories and subdirectories)

## 4 Online Textbook

The required textbook for this class is available online. To access the text:

1. Sign in or create an account at [learn.zybooks.com](http://learn.zybooks.com)
2. Enter zyBook code `WFUCSC111BallardFall2017`
3. Subscribe

A subscription is \$48 and will last until Dec 29, 2017.

## 5 Assessment

There will be 8 problem sets, 5 quizzes, 2 midterms, a final exam, and a project.

Problem sets will allow you to apply the concepts from lecture to solve problems with Java programs. They will be completed both in and out of class, so you are expected to always bring your laptop to class. You are encouraged to work with other students, but the work and the code must be your own.

Mastery of the material will be assessed with quizzes and tests. Quizzes will be in-class and last 10-15 minutes. The lowest quiz score will be dropped. The two midterms and final will be taken in class; the final exam will be cumulative. Make-up quizzes and tests will be administered only if excused in advance.

A final group project will be assigned towards the end of the semester. It will include lab assignments, presentations, and a final deliverable (a web app!).

## 6 Participation

Regular attendance of class is expected, as is verbal participation during lectures. There will also be frequent in-class exercises, done individually and often in small groups. Reading and interacting with the online textbook is also required: the sections of the text that correspond to each lecture will be listed on the course schedule (other sections will be marked Optional).

## 7 Grading

Course grades are determined using the following weightings:

- 20% problem sets
- 10% participation
- 10% quizzes
- 10% project
- 30% midterms
- 20% final

Letter grades are assigned based on the following categorization:

|                      |             |                      |          |
|----------------------|-------------|----------------------|----------|
| <b>A</b>             | 92 or above | <b>C</b>             | 72–77.99 |
| <b>A<sup>−</sup></b> | 90–91.99    | <b>C<sup>−</sup></b> | 70–71.99 |
| <b>B<sup>+</sup></b> | 88–89.99    | <b>D<sup>+</sup></b> | 68–69.99 |
| <b>B</b>             | 82–87.99    | <b>D</b>             | 62–67.99 |
| <b>B<sup>−</sup></b> | 80–81.99    | <b>D<sup>−</sup></b> | 60–61.99 |
| <b>C<sup>+</sup></b> | 78–79.99    | <b>F</b>             | below 60 |

## 8 Contacting Me

In general, email is the best way to reach me, and I'm happy to take questions over email. The easiest way to find me in person is to stop by my office during office hours, though please feel free to drop by any time. If you want to be sure to find me then you can also email ahead to schedule a time; it helps to propose a few times that work for you so that I can choose one that works for me too. Please contact me as soon as possible if you know you will miss class due to a university-sponsored activity, such as athletics.

## 9 Academic Integrity

All tests and quizzes are to be done independently. Problem sets may be discussed with other students, however the work submitted must be your own work and reflect your understanding of the material. Copying of work from other students or from Internet-based resources is not acceptable and will be dealt with through the Honor System. I recommend that you retain drafts of your work and programs until the end of the semester in case a question arises as to authorship.

## 10 Learning Assistance Center

If you have a disability that may require an accommodation for taking this course, then please contact the Learning Assistance Center (758-5929) within the first two weeks of the semester and bring it to my attention as appropriate.

## 11 Supporting Fellow Students in Distress

As members of the Wake Forest community, we have a personal responsibility to ensure that this classroom and the campus as a whole remains a healthy and safe environment for learning. Occasionally, you may come across a fellow classmate whose personal behavior concerns or worries you, either for the classmate's wellbeing or yours. If this should occur, you are encouraged to send your concern to the Wake Forest CARE Team at <http://careteam.wfu.edu/how-to-make-a-report/>. By utilizing your insights and observations, we can work together to help individuals get connected to appropriate resources and keep our community safe.

## 12 Emergency Preparedness Policy

In the unlikely event of a major disruption of normal university activities (such as might result from a health emergency or other disaster), a course continuation contingency plan will be enacted in order to allow completion of the course.

During this time, students should continue with the reading and other assignments listed on the syllabus and monitor email, Sakai, and the WFU website for information. If students have questions or are in doubt about how to proceed, they should contact the instructor by email if available, otherwise they should contact by phone.