

**Professor:** Torgersen      **E-mail:** *torgerse@wfu.edu*      **Office Phone:** 758-5536

**Office Hours:** Mon. and Wed. 3:30 to 4:30, Thu. at 2:00 to 4:30 and by appointment.

**Text:** Introduction to Programming in Java An Interdisciplinary Approach, 2nd Edition, by Robert Sedgewick and Kevin Wayne

**Facilities:** gottlieb.cs.wfu.edu. Xubuntu (Linux), XFCE Desktop, X2Go remote desktop software, your personal computers, “The Bridge” in Z. Smith Reynolds Library, menehune web server, and the WFU C.S. Center.

**Web page:** <http://menehune.opt.wfu.edu/csc111>

**Teaching Assistant:** TBA

### 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 plug-ins. 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.

### Course Topics

- Overview of the Programming Concepts
- 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

## **Object-Oriented Programming**

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

## **Other Topics**

- The compile/link/run process
- Types of errors: syntax, logical, run-time

## **Tools and Skills**

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

## **Expectations:**

- Class attendance.
- Class participation; communicate if things get complicated.
- Use of good coding practices and some basic coding standards in programming projects.
- Your best effort.

## **Excused Absences:**

- Missing an exam is only excused for a limited number of reasons and circumstances must be verifiable. Acceptable circumstances include only:
  - Official excused absences, e.g., varsity sports, dance team, marching band, etc.
  - A medical reason.
  - Childbirth (by you or your spouse/partner).
  - Military duty.
  - The passing of a family member.
- The final exam date is Thursday, December 14, 2017 at 2:00pm. Early exam times are not available to accommodate travel plans.

## **Grading:**

Three exams (65%), programming assignments and take home problem sets (35%).

## **Disability Notice:**

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.

## **Pandemic Planning Notice:**

The University has requested that faculty collect personal contact information as part of emergency planning and preparation. The information you provide is strictly confidential.