

# Computer Science, Grade 12, University Preparation

## Course Outline

### UNIT ONE - Programming in Java

Essential Question: What is Java? How do we work with data types? How do we code condition and control structures?

- In this unit, students will review programming basics, and work in Java using the Netbeans IDE. Students will learn about data types, commenting, and arrays. Students will also research the impact of computers on the environment.

### UNIT TWO - Modular Programming

Essential Question: What is Object Oriented Programming? How do we read and write to files? How do we use industry standard testing and documentation?

- In this unit, students will learn about Object Oriented Programming, how to read and write to files, and how to use industry standards for testing and documenting.

### UNIT THREE - Arrays and Algorithm Analysis

Essential Question: How can we make and work with two dimensional arrays? How do we determine how long an algorithm will take to run and choose an efficient algorithm?

- In this unit, students will investigate efficient ways to search and sort arrays. Students will learn about two-dimensional arrays and how to calculate the worst case time an algorithm takes to run.

### UNIT FOUR - Recursion and Project Management

Essential Question: How can we write recursive methods effectively? How can we make Graphical User Interfaces (GUIs) in java? What are some standard project management tools, and can we use them to manage a software development project?

- In this unit, students will learn how to write recursive methods, make GUIs, and manage projects.

### CULMINATING PROJECT

- This project is one of the final evaluations of ICS4U online. This project will challenge students to use all the concepts they have learned throughout this course and is worth 10% of the final grade.