

Computer Science 30 (Distance Education) Syllabus

GENERAL INFORMATION:

- i. Computer Science 30 is a Distance Ed course designed for the students to work at their own pace.
- ii. Instructor – Jim Swan (Watrous Elementary School, Watrous)
- iii. Location: Horizon School Course is accessible at <https://courses.horizonsd.ca/course/view.php?id=1164>
- iv. Ways to contact Mr. Swan:
 - a. Send me a Private Message in Moodle (*Preferred)
 - b. **Email address:** jim.swan@horizonsd.ca
 - c. **School:** 306.946.7929 **Home:** 306.946.3000
 - d. **Text:** 306.946.7929 **or message me through gmail chat**

COURSE DESCRIPTION:

- i. Computer Science 30 is about computer systems and programming. This course is built upon a problem-solving approach. You will be given numerous scenarios, or problems, that you will have to solve through algorithms. Much of the course will be coding using Javascript and Java. Computer Science 30 builds on programming and computational thinking concepts that were introduced in Computer Science 20. Students will investigate data structures, sorting algorithms, effective coding practices, and collaborative programming practices. Students will create programs that utilize external files, libraries, and recursion. The two major programming languages will be graphical “Javascript” through Khan’s Academy and a deep dive into the object-oriented programming in “Java” using Greenfoot. (Students may wish to explore a Java IDE such as NetBeans for their Capstone Project)
- ii. Prerequisite: CS20
- iii. Course Code: ? - CSC300 Computer Science 300

STUDENT LEARNING OUTCOMES:

The Computer Science 30 curriculum consists of the following outcomes:

Core Principles and Techniques

Outcomes:

CS30-CP1

Implement effective coding practices throughout Computer Science 30.

CS30-CP2

Engage in collaborative programming practices.

Fundamentals of Programming

Outcomes:

CS30-FP1

Investigate types of data structures and the advantages of organizing data in different ways.

CS30-FP2

Create programs that utilize external files.

CS30-FP3

Use libraries to simplify solutions to programming problems.

CS30-FP4

Explore the concepts and principles of object-oriented programming.

Core Concepts

Outcomes:

CS30-CC1

Explore recursion and investigate sorting algorithms.

CS30-CC2

Explore number systems and character encoding used in computing.

Capstone Coding Concepts

Outcomes:

CS30-CAP1

Create a large-scale computer program to demonstrate proficiency in procedural or object-oriented programming.

CS30-CAP2

Document and reflect on the process of creating a large-scale computer program.

TEACHING STRATEGIES:

- i. The course is located on the Division Moodle Server.
- ii. The course is divided into 5 topics. They will include a mixture of text-based learning as well as videos. I will have an overview video for each of the topics. Students are strongly encouraged to keep in touch with the instructor via email and Moodle messages.
- iii. Much of the course requires the student to learn by reading, writing and debugging code. Problem-solving and computational thinking are keys to understanding how to code. Students need to adopt a “learn by trying approach”.
- iv. One of the major components is a Capstone Coding Project. This can be a **coding project** of their own or a **research-based project**. The capstone coding project is a multifaceted assignment that serves as a culminating experience for students in Computer Science 30. The preference is for the project to be student directed.

The project should encapsulate the entire development process from conceptualization to delivery of a working product. The scale of the project should reflect the amount of time allocated to it. While students may incorporate project management techniques to manage the project, learning project management is **not an outcome of Computer Science 30**.

COURSE MATERIALS

- i. The course primarily utilizes two programming languages; “Javascript” – using Khans (Netbeans or Makecode programming interfaces are possible with the project) and “Java” – using Greenfoot (“Netbeans or another IDE can be explored).
- ii. Students will need access to a computer (a Chromebook would work for portions of the course but you would need to install Greenfoot on a PC/Mac or Linux device).
- iii. The course is designed around the Greenfoot Java Programming Platform. Greenfoot programs are written in standard Java, one of the primary languages in academia and industry. Concepts learned transfer directly to programming in subsequent environments. Greenfoot makes the environment easy enough to use for beginners, and Java makes it powerful enough to write impressive, flexible and sophisticated applications. Greenfoot can be found at <https://www.greenfoot.org/home>. Object-Oriented Programming (OOP) Object-oriented programming is a design paradigm built on four major principles: encapsulation, abstraction, inheritance and polymorphism. Gaining experience in organizing information into objects that can interact with one another is one of the major new concepts to be introduced in Computer Science 30 and the best part is by the end you will know how to program a cool game! 😊

The evaluation plan for Computer Science 30 is:

- ❖ 60% Assignments
- ❖ 20% Capstone Project (due at the end of the course)
- ❖ 20% Unit Quizzes and Exams
- ❖ **100%**

Course Schedule and Due Dates

Semester 1 students

Unit of Study	Dates
Module 1:	Sept 1 - Sept 24
Module 2:	Sept 24 - Oct 28 Full Year: Module 1 Due
Module 3:	Oct 28 - Nov 22
Module 4:	Nov 22 - Dec 21 Full Year: Module 2 Due
Capstone Project	Dec 21 - Jan 24

Any outstanding assignments must be submitted no later than January 24th.

Capstone Project Due - Jan 24 or sooner upon request!

Full Year Students, please note the **Dates in Red**

Semester 2 students

Unit of Study	Dates
Module 1:	Feb 1 - 25
Module 2:	Feb 25 - Mar 25 Full Year: Module 3 Due
Module 3:	Mar 25 - April 29
Module 4:	April 29 - June 3 Full Year: Module 4 Due
Capstone Project	June 3 - June 22

Full Year Students, please note the **Dates in Red**

Any outstanding assignments must be submitted by June 22th and will be marked as time permits.

Capstone Project must be completed by June 22nd.