Canada World Education Centre
Course Outline

Course: Computer Science

Grade: 12	Type: University	Credit Value: 1	Course Code: ICS4U
Teacher: J.F. Michaud		Development Date: 04/15/2019	
Course Reviser:Vizarat Shaikh Date:		Prerequisite: ICS3U	

Ministry Curr. Doc:The Ontario Curriculum Grades 9 to 12, Course Descriptions and Prerequisites, 2018

Course Description

This course enables students to further develop knowledge and skills in computer science. Students will use modular design principles to create complex and fully documented programs, according to industry standards. Student teams will manage a large software development project, from planning through to project review. Students will also analyse algorithms for effectiveness. They will investigate ethical issues in computing and further explore environmental issues, emerging technologies, areas of research in computer science, and careers in the field.

Overall Expectations for Student Learning

Programming Concepts and Skills	A1. demonstrate the ability to use different data types and expressions when creating computer programs; A2. describe and use modular programming concepts and principles in the creation of computer programs; A3. design and write algorithms and sub-programs to solve a variety of problems; A4.use proper code maintenance techniques when creating computer programs
Software Development	B1. demonstrate the ability to manage the software development process effectively, through all of its stages – planning, development, production, and closing; B2. apply standard project management techniques in the context of a student-managed team project.
Designing Modular Programs	C1. demonstrate the ability to apply modular design concepts in computer programs; C2. analyse algorithms for their effectiveness in solving a problem.
Topics in Computer Science	D1. assess strategies and initiatives that promote environmental stewardship with respect to the use of computers and related technologies; D2. analyse ethical issues and propose strategies to encourage ethical practices related to the use of computers; D3. analyse the impact of emerging computer technologies on society and the economy; D4. research and report on different areas of research in computer science, and careers related to computer science.

Outline of Course Content Unit:	Hours:

Unit 1. Review of Programming in Java	**20**
Unit 2. Object Oriented Programming in Java	**25**
Unit 3. GUI Programming in Java	**25**
Unit 4. Random Access Files, Sorting, Searching, Vectors	**25**
Unit 5. Project Management	**15**

Teaching and Learning Strategies

Teachers use a variety of teaching strategies to maximize student learning. The following teaching strategies will be used in this course:

Helping students become self-directed.

In order to address the unique learning styles of students in this course, a variety of activities and learning experiences should be offered, including, but not restricted to: questioning, demonstrations, role-plays, simulations, co-operative group learning, brainstorming, discussion, peer coaching, interviewing, reflective writing, reflective thinking exercises, concept mapping, reading, tutoring, direct instruction, one-on-one teaching, and experimental learning.

Teachers will find ways throughout the course for students to make authentic learning connections with their other courses, the school, local community and the world at large.

Assessment & Evaluation of Student Performance

Assessment & Evaluation

The primary purpose of assessment and evaluation is to improve student learning and to help students assume responsibility for their learning.

Mid-semester and final marks are determined through evaluations or Assessments of Learning, which typically occur towards the end of a unit and end of semester. During the learning process, information about a student's learning is gathered and used by the teacher and student to inform decisions that affect goal setting and teaching in the classroom. The data gathered as Assessment as Learning and Assessment for Learning do not carry a mark weight, but do play a crucial role in student success as they help inform the teacher about each student's progress. All types of assessments allow teachers to provide descriptive feedback that is clear, specific, meaningful, and timely to support improved learning and achievement.

Learning Skills and Work Habits (responsibility, organization, independent work, collaboration, initiative, self-regulation) will be reported by a letter (E = Excellent, G = Good, S = Satisfactory, N = Needs Improvement). These skills and habits support a high level of success in meeting the course expectations in addition to contributing to the development of positive life and work skills for the future.

Considerations for Program Planning

Program Planning Considerations •Individual Education Plan: Accommodations to meet the needs of exceptional students as set out in their Individual Education Plan will be implemented within the classroom program. Additional assistance is available through the Special Education program. • The Role of Technology in the Curriculum. Using information technology will assist students in the achievement of many of the expectations in the curriculum regarding research, written work, analysis of information, and visual presentations.

- **English As a Second Language (ESL): Appropriate accommodations in teaching, learning, and evaluation strategies will be made to help ESL students gain proficiency in English, since students taking ESL at the secondary level have limited time in which to develop this proficiency.**

Resources

Technological Devices:

CWEC supports the use of technology to enhance learning, but the use of such electronic technology in the classroom is at the discretion of the teacher. Working together we can ensure the appropriate use of technology by all members of our school community