

**Canada World Education Centre
Course Outline**

Course: Computer Engineering			
Grade: 12	Type: University/College	Credit Value: 1	Course Code: TEJ4M
Teacher: J.F. Michaud		Development Date: 04/15/2019	
Course Reviser: Vizarat Shaikh		Prerequisite: TEJ3M	
Date:			
Ministry Curr. Doc: The Ontario Curriculum Grades 9 to 12, Course Descriptions and Prerequisites, 2018			
<p>Course Description</p> <p>This course extends students' understanding of computer systems and computer interfacing with external devices. Students will assemble computer systems by installing and configuring appropriate hardware and software, and will learn more about fundamental concepts of electronics, robotics, programming, and networks. Students will examine related environmental and societal issues, and will explore postsecondary pathways leading to careers in computer technology.</p>			
<p>Overall Expectations for Student Learning</p> <p>Strand 1: Computer Technology Fundamentals</p> <ul style="list-style-type: none"> ● demonstrate an understanding of internal buses and storage devices, and of advances in computer technology ● demonstrate an understanding of system optimization and of permissions, attributes, firmware, and communication standards used in computer systems; ● demonstrate an understanding of devices and electronic circuits in interfaces and control systems; ● demonstrate an understanding of network addressing and routing; ● demonstrate an understanding of computer logic circuits and the representation, manipulation, and transmission of data by computers. <p>Strand 2: Computer Technology Skills</p> <ul style="list-style-type: none"> ● build computer systems and connection media to meet specific requirements, using appropriate procedures, tools, and equipment; ● maintain and troubleshoot a variety of computer hardware and software; 			

- design, build, test, and troubleshoot interfaces and other circuits that meet specific design requirements;
- design, build, configure, maintain, and troubleshoot networks, and set up various network services for users;
- demonstrate an understanding of programming concepts, and create programs that interact with external devices.

Strand 3: Technology, the Environment, and Society

- analyse environmental issues related to the widespread use of computers and associated technologies, and apply strategies to reduce environmental harm from computer use;
- analyse societal issues related to the widespread use of computers and associated technologies.

Strand 4: Professional Practice and Career Opportunities

- explain the importance of safety standards and practices, and use appropriate techniques to avoid health and safety problems;
- describe ethical and security issues related to the use of computers and related technology;
- assess career opportunities related to computer technology and electronics, and explain the importance of postsecondary education and lifelong learning in the computer technology industry.

Outline of Course Content Unit:	Hours:
Unit 1. Computer Hardware	10
Unit 2. Electronics, Robotics, and Computer Interfacing	15
Unit 3. Networking	5
Unit 4. Data Representation and Digital Logic	5
Unit 5. Software	20
Unit 6. Computer Programming	20
Unit 7. Technology and the Environment	10
Unit 8. Technology and Society	10
Unit 9. Health and Safety Management	5
Unit 10. Ethics and Security	5
Unit 11. Career Opportunities	5

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