



# Canada World Education

## Course Outline

<b>Course: Computer Technology and Robotics</b>			
<b>Grade:</b> 11	<b>Type:</b> M	<b>Credit Value:</b> 1	<b>Course code:</b> TER3M0
<b>Teacher:</b> J.F. Michaud		<b>Development date:</b> Dec. 2019	
<b>Course Reviser:</b> Mr. Shaikh <b>Date:</b> Jan. 2020		<b>Prerequisites:</b> TEJ2O	
<b>Ministry Curr. Doc:</b> The Ontario Curriculum, Grades 11 and 12, Technological Education			
<p><b>Course Description:</b> This course examines computer systems and control of external devices. Students will assemble computers and small networks by installing and configuring appropriate hardware and software. Students will develop knowledge and skills in electronics, robotics, programming, and networks, and will build systems that use computer programs and interfaces to control and/or respond to external devices. Students will develop an awareness of related environmental and societal issues, and will learn about college and University programs leading to careers in computer, mechatronics, automation and robotics technology.</p>			
<p><b>Overall Expectations for Student Learning</b> A1. describe how computer components function, and discuss trends in the development of computer hardware; A2. describe the functions of BIOSes and operating systems, and how they interact with each other and with computer hardware; A3. describe the function of electronic components and the use of these components in control systems and other circuits, and calculate values for circuit components; A4. describe network concepts, services, and security; A5. demonstrate an understanding of the use of binary numbers, hexadecimal numbers, and Boolean algebra in computer logic and data processing.</p>			
<b>Outline of course content</b>		<b>Hours:</b>	
<b>Unit:</b>			
1. Computer Systems		15	
2. Mechanical systems		25	
3. Electronics, Robotics, and Computer Interfacing		35	
4. Networking Concepts		15	
5. Data Representation and Digital Logic		15	
Summative assessment		5	
		Total hours: 110	
<b>All course components are online</b>			



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## 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:

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 experiential learning and hands on work. The goal is to help students become self-directed.

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

### Evaluations Throughout the course: 70% of final grade

1. Computer Systems	10 %
2. Mechanical systems	25 %
3. Electronics, Robotics, and Computer Interfacing	35 %
4. Networking Concepts	20 %
5. Data Representation and Digital Logic	10 %

### Final Evaluation: 30% of final grade

## Assessment & Evaluation

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

Mid-term and final marks are determined through evaluations or Assessments *of* Learning, which typically occur towards the end of a unit and the end of the term. 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



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success in meeting the course expectations in addition to contributing to the development of positive life and work skills for the future.

## **The achievement chart for Technical education**

### **Categories of Knowledge and skills**

The categories of knowledge and skills are described as follows:

**Knowledge and Understanding.** Subject-specific content acquired in each course (knowledge), and the comprehension of its meaning and significance (understanding).

**Thinking.** The use of critical and creative thinking skills and/or processes, as follows: planning skills (e.g., identifying the problem, selecting strategies and resources, scheduling) processing skills (e.g., analysing and interpreting information, reasoning, generating and evaluating solutions, forming conclusions) critical/creative thinking processes (e.g., problem-solving, design, and decision making processes)

**Communication.** The conveying of meaning through various forms, as follows: oral (e.g., role play, discussion, presentation) written (e.g., design briefs, work orders, technical reports) visual (e.g., technical drawings, flow charts, graphics)

**Application.** The use of knowledge and skills to make connections within and between various contexts.

## **Considerations for Program Planning**

- 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 tutoring.
- 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.



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- Programs will involve an open, collaborative, activity-based approach to teaching that accommodates students' interests, aspirations, and learning styles. Activities will be designed to include both individual and team approaches, with emphasis on equity and inclusive education, financial literacy, careers, and health and safety.

**Resources:**

Resources vary by course and unit. All course resources are documented in each unit and lesson.

**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.