



# GEORGE S. HENRY ACADEMY COURSE OUTLINE



## Computer Engineering Grade 12

<b>COURSE CODE</b>	TEJ4M101	<b>GRADE</b>	12
<b>TEACHER(S)</b>	Ms Hakimi	<b>CREDIT VALUE</b>	1
<b>DEPARTMENT</b>	Computer Studies	<b>PREREQUISITE</b>	TEJ3M1

<b>COURSE DESCRIPTION:</b>	<p>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 technology. _ The Ontario Curriculum Grades 11 and 12: Technological Education (2009)</p>
	<p><b>Computer Technology Fundamentals</b> By the end of this course, students will:</p> <ul style="list-style-type: none"> <li>• demonstrate an understanding of internal buses and storage devices, and of advances in computer technology;</li> <li>• standards used in computer systems;</li> <li>• demonstrate an understanding of devices and electronic circuits in interfaces and control systems;</li> <li>• demonstrate an understanding of network addressing and routing;</li> <li>• demonstrate an understanding of computer logic circuits and the representation, manipulation, and transmission of data by computers.</li> </ul> <p><b>Computer Technology Skills</b> By the end of this course, students will:</p> <ul style="list-style-type: none"> <li>• build computer systems and connection media to meet specific requirements, using appropriate procedures, tools, and equipment;</li> <li>• maintain and troubleshoot a variety of computer hardware and software;</li> <li>• design, build, test, and troubleshoot interfaces and other circuits that meet specific design requirements;</li> <li>• demonstrate an understanding of programming concepts, and create programs that interact with external devices.</li> </ul> <p style="text-align: center;">Additional information can be found at: <a href="http://www.edu.gov.on.ca/eng/curriculum/secondary/subjects.html">http://www.edu.gov.on.ca/eng/curriculum/secondary/subjects.html</a></p>

<b>COMMUNICATION</b>
<p>Please direct all questions or concerns regarding student progress or program of study to the course teacher. Please call the main office to leave a message at 416-395-3240.</p> <p>Or email at: <b>narges.shams-hakimi@tdsb.on.ca</b></p>

<b>CONCRETE LEARNING RESOURCES</b>	<b>DIGITAL LEARNING RESOURCES</b>
No formal textbook	Class lessons and assignments can be found on the class website on <b>Desire to Learn website</b>
	<b>Variety of online resources are available that students can use as references</b>

## GEORGE S. HENRY ACADEMY'S COURSE WORK POLICY

For each evaluation, the teacher will inform students of the **due date** and the **ultimate deadline**. The ultimate deadline is the last opportunity for students to submit and assignment for evaluation. Teachers may also use a variety of other methods for dealing with late and missed assignments at their discretion.

### Strategies to assist students in meeting deadlines include:

- Peer tutoring
- Using the school app
- Using a personal agenda
- Seeking extra help from teachers
- Requesting for assistance with time management and organizational skills
- Getting help from parents/guardians
- Getting help from a caring adult in the school

## ASSESSMENT AND EVALUATION OF STUDENT ACHIEVEMENT

Each course follows an achievement chart which enables teachers to make judgements about student work that are based on clear performance standards and on a body of evidence collected over time. Additional information can be found on the Ministry of Education website noted within the course description.

## ACHIEVEMENT CHART CATEGORIES

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

**Thinking (T):** The use of critical and creative thinking skills and/or processes

**Communication (C):** The conveying of meaning through various forms

**Application (A):** The use of knowledge and skills to make connections within and between various contexts

## COURSE WORK (70% of your overall grade)

Categories	%	Possible Assessments of Learning
<b>K &amp; U</b>	<b>17.5%</b>	<p><b>Knowledge of content</b> (facts, terms, procedural skills, use of tools) <i>Ex. (write example here)</i></p> <p><b>Understanding of content</b> (Understanding of mathematical concepts) <i>Ex. (write example here)</i></p>
<b>T</b>	<b>17.5%</b>	<p><b>Use of planning skills</b> – understanding the problem (e.g., formulating and interpreting the problem, making conjectures) – making a plan for solving the problem <i>Ex. (write example here)</i></p> <p><b>Use of processing skills</b> – carrying out a plan (e.g., collecting data, questioning, testing, revising, modelling, solving, inferring, forming conclusions) – looking back at the solution (e.g., evaluating reasonableness, making convincing arguments, reasoning, justifying, proving, reflecting) <i>Ex. (write example here)</i></p> <p><b>Use of critical/creative thinking processes</b> (e.g., problem solving, inquiry) <i>Ex. (write example here)</i></p>
<b>C</b>	<b>14%</b>	<p><b>Expression and organization of ideas and information</b> (e.g., clarity of expression, logical organization), using oral, visual, and written forms (e.g., pictorial, graphic, dynamic, numeric, algebraic forms; concrete materials) <i>Ex. (write example here)</i></p> <p><b>Communication for different audiences and purposes</b> (e.g., peers, teachers) and purposes (e.g., to present data, justify a solution, express a mathematical argument) <b>in oral, visual, and written forms</b></p>

		<i>Ex. (write example here)</i> <b>Use of conventions</b> (e.g., terms, symbols) in oral, visual, and written forms <i>Ex. (write example here)</i>
<b>A</b>	<b>21%</b>	<b>Application of knowledge and skills in familiar contexts</b> <i>Ex. (write example here)</i> <b>Transfer of knowledge and skills to new contexts</b> <i>Ex. (write example here)</i> <b>Making connections within and between various contexts</b> (e.g., connections between concepts, representations, and forms within mathematics; connections involving use of prior knowledge and experience; connections between mathematics, other disciplines, and the real world) <i>Ex. (write example here)</i>

### FINAL EVALUATION (30% of your overall grade)

Type	Description	30%
Culminating Task(s)	Culminating Assignment Combination of Electronic Circuit Design and Arduino Programming Interface Alternative Can Be to Design a Decimal 2 Digits Counter Using 7-Segment Display	K/T/ C/A
Exam	There is no exam in this course	

### UNITS OF STUDY/COURSE ROAD MAP (subject to change)

#### Unit 1: Web Design

1. Web Design Using HTML & CSS	K
2. Code Academy Practice	K
3. Design Your Own Website Project	K/T/C/A

#### Unit 2: Hardware, Software & Operating Systems

1. Review Computer Construction & Components	K/T/A
2. Structure of Storage Devices and Communication Buses	K/C/A
3. Different Operating Systems	K/T/A
4. Unit Test	K/T/A/C

#### Unit 3: Electronic Circuits

1. Basic Elements of an Electronic Circuit	K/T
2. Electronic Components /LEDs/ Resistors/ Capacitors	K/T/A
3. Charging and Discharging Capacitors	

4. Series and Parallel Circuits	K/T/C/A
5. Series and Parallel Circuits Lab	
6. Unit Test	K/T/C/A

#### Unit 4: Digital Circuits

1. Review Basic Logic Gates AND,OR, NAND, NOR, NOT	K/T/A
2. Review Basic Logic Gates Lab	
3. Introducing Flip Flop and Counters	K/T/A
4. Flip and Flops and Timer 555 Lab	K/T/A
5. Unit Test	

#### Unit 5: Programming C++ Using Arduino

1. Introduction to Arduino Hardware	
2. Introduction to Programming Arduino	K/T
3. Using Arduino in Small Projects Lab	K/T/A
4. Controlling Traffic Lights Using Arduino Project	K/T/C/A

#### Unit 6: Communication technologies, job opportunities and environmental effect

1. Effect of the Communication technology on Environment Research	C
2. Job Opportunity Research	C
3. Evaluation Can be Research Report and Presentation	C

**The date they are scheduled is flexible due to different learning curves for classes. Tests are not given until the teacher believes the class is ready. The order of the units in this table is not necessarily the order in which they will be presented in this course**

#### **GEORGE S. HENRY ACADEMY'S LATE & MISSED EVALUATION POLICY**

It is the responsibility of the student to make arrangements with their teacher for any missed course material and/or assignments. Extenuating circumstances will be considered on a case-by-case basis.

#### **GEORGE S. HENRY ACADEMY'S ACADEMIC DISHONESTY POLICY**

Cheating and plagiarism will not be condoned. For more information, refer to the Academic Honesty Policy found in the Student Handbook. The Student Handbook can be found in the George S. Henry Academy app.

**SPECIALIST HIGH SKILLS MAJOR (SHSM) REQUIREMENTS**

<b>GRADE 11 AND 12 CREDITS</b>	<b>ENVIRONMENT</b>	<b>HEALTH &amp; WELLNESS</b>	<b>HOSPITALITY &amp; TOURISM</b>
Major Credits	4	4	4
English ( <i>including a CLA*</i> )	2	1	1
Mathematics ( <i>including a CLA</i> )	1	1	1
Science or Social Sciences and Humanities ( <i>including a CLA</i> ) ( <i>May be substituted with 1 coop credit</i> )	-	1	-
Business Studies or Science ( <i>including a CLA</i> ) ( <i>May be substituted with 1 coop credit</i> )			1
Cooperative Education	2	2	2
<b>TOTAL</b>	<b>9</b>	<b>9</b>	<b>9</b>

\*Contextualized Learning Activity