Computer Engineering Technology – TEJ4M
Course Information & Evaluation

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.

PREREQUISITE: Computer Engineering Technology, Grade 11, University/College Preparation

Overall Expectations

Fundamentals

A1. demonstrate an understanding of internal buses and storage devices, and of advances in computer technology;

A2. demonstrate an understanding of system optimization and of permissions, attributes, firmware, and communication standards used in computer systems;

A3. demonstrate an understanding of devices and electronic circuits in interfaces and control systems;

A4. demonstrate an understanding of network addressing and routing;

A5. demonstrate an understanding of computer logic circuits and the representation, manipulation, and transmission of data by computers.

Skills

B1. build computer systems and connection media to meet specific requirements, using appropriate procedures, tools, and equipment;

B2. maintain and troubleshoot a variety of computer hardware and software;

B3. design, build, test, and troubleshoot interfaces and other circuits that meet specific design requirements;

B4. design, build, configure, maintain, and troubleshoot networks, and set up various network services for users;

B5. demonstrate an understanding of programming concepts, and create programs that interact with external devices.

Technology, The Environment & Society

C1. analyse environmental issues related to the widespread use of computers and associated technologies, and apply strategies to reduce environmental harm from computer use;

C2. analyse societal issues related to the widespread use of computers and associated technologies.

Professional Practice & Careers

D1. explain the importance of safety standards and practices, and use appropriate techniques to avoid health and safety problems;

D2. describe ethical and security issues related to the use of computers and related technology;

D3. assess career opportunities related to computer technology and electronics, and explain the importance of postsecondary education and lifelong learning in the computer technology industry

Strands/Units Topics

1. Review ICE3M (binary numbers, logic gates, electricity, circuit diagrams, wiring-up circuits)	SUMMATIVE 1: Design and create a system controlled by sound.
2. Combinational Logic Simplification Using Karnaugh Maps	7. Analog-to-Digital Conversion: Theory and Application
3. Working with an Oscilloscope	8. Ramping it up with the Arduino (one step up from a simple microcontroller)
4. Working with Microcontrollers (the C language, i/o ports, etc.)	9. Networking
	10. Controlling an LED Matrix
5. Making "8-bit" Music with a Microcontroller	11. Controlling servo motors
6. Sensor Circuits: How computers see and hear the world	SUMMATIVE 2: Light-tracker: Using 2 servo motors to allow a machine to autonomously look up and down to follow a light source.

Course Text and Reference Resources

Online resources, and Technical resources

Assessment & Evaluation Policy

Refer to the attached SWL Assessment and Evaluation Policy April 2011

Attendance Policy

Students are responsible for catching up on class notes and completing any assignments or tasks involving equipment for which they were absent. *It is up to the students to ask the instructor what they missed when they return*. Parents will be contacted for any student who skips class. After three such skips, the student will be referred to the Vice-Principal.

70% Formative Evaluation

Student evaluation is based on the Overall Expectation found in the Ontario Curriculum using various forms, such as, but, not limited to, quizzes, tests, assignments, projects, presentations, safety practices, and activities.

30% Summative Evaluation

Each student will complete two summative projects representing 30% of their mark.

Certain forms of these summative evaluations (exams, final tests, performance based tasks, etc.) are time sensitive. This means they must be completed at and within a specific time. Students must be present for these summative evaluations. Any absence will result in a mark of zero, unless validated by an official certificate. (ex. Medical Certificate). Students and parents will be informed well in advance of summative evaluation dates.

Classroom Expectations

1. Students are expected to be willing and active participants in all course activities. This includes completing all assignments both on time and with sufficient effort, and honoring all of their commitments.

2. Students will contribute to a positive learning environment by: • practicing safe work habits at all times • being respectful to others and respecting their property • treating all equipment with care and ensuring proper knowledge of its operation • reporting unsafe or hazardous situations to the instructor • reporting software or equipment problems to the instructor • cleaning up their workspace and putting everything away before they leave the class*** Electronic storage devices, headphones and open toed shoes cannot be used in the shop areas * No food or drink is permitted in any of the equipment areas.**