Exploring Computer Technology: Robotics - TEJ1O

Course Information & Evaluation

This course introduces students to computer systems, networking, and interfacing, as well as electronics and robotics. Students will assemble, repair, and configure computers with various types of operating systems and application software. Students will build small electronic circuits and write computer programs to control simple peripheral devices or robots. Students will also develop an awareness of related environmental and societal issues, and will learn about secondary and postsecondary pathways and career opportunities in computer technology. *PREREQUISITE: none*

Overall Expectations

Fundamentals

A1. identify and describe the functions of, as well as important advances related to, electronic and computer components;
A2. demonstrate a basic understanding of computer networks and their components;
A3. demonstrate a basic understanding of binary numbers and digital logic.

Skills

B1. install and configure the hardware and operating system of a workstation, and use file-management techniques effectively;
B2. construct and test simple interfaces and other electronic circuits;
B3. assemble and configure a simple computer network;
B4. install and use a variety of software;
B5. apply fundamental programming concepts to develop a variety of simple programs, including a program to control an external device.

Technology, The Environment & Society

C1. identify harmful effects of the widespread use of computers and associated technologies on the environment, as well as agencies that reduce these effects;
C2. identify effects of the widespread use of computers and associated technologies on society.

Professional Practice & Careers

D1. follow appropriate health and safety procedures when assembling, using, and maintaining computer systems;
D2. demonstrate an understanding of ethical and security issues related to the use of computers;
D3. identify various careers related to computer technology, and describe the education and/or training required for them.

Strands / Units Topics

1. Binary Numbers
2. Introduction to Programming
3. Electricity fundamentals
4. Working with Microcontroller outputs: LEDs, speakers, motors
5. Working with Microcontroller inputs: buttons, light sensors, microphones, infra-red reflective object sensors
6. Autonomous vehicles: theory and practice
7. Summative - (x2)

Course Text and Reference Resources

Arduino website: www.arduino.cc, Processing website: processing.org

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

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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.**