



A. Y. Jackson S. S.
www.ayjackson.ca

TER3M1 Computer Engineering: Robotics and Control Systems Grade 11, University/College Preparation

General Course Information

Prerequisite:	None
Department:	Computers Studio / Technology
Extra Help:	By appointment with teacher
Textbook and Replacement Cost:	<i>Computer Engineering</i> by G. Smyth & C. Stephenson (\$ 38.00)
Material Required:	None
Course Fee:	None

Course Description

This course helps students understand:

A) how computer hardware and software are used to solve computer-related problems from an engineering perspective. Students will explore ways of connecting computers, interfaces, and peripherals using their knowledge of logic gates, computer components, peripherals, programming, and operating systems. Students will also construct systems that use computer programs to interact with hardware, install and configure key computer hardware and software components, develop an understanding of the ethical use of computers, and explore careers in computer engineering.

B) the fundamental approaches and knowledge on Robotics Design and its Production. Function of microcontrollers as the control system of robots will also be discussed and practical work will be implemented. Competition in Robotics may be part of the course activities with the intention that it will allow students to acquire more practical experience.

Assessment and Evaluation

To promote student success, ongoing assessment and feedback will be given regularly to the students. A variety of assessment and evaluation strategies will be used in this course, including electronics, robotics and programming assignments, written quizzes and tests. Expectations will be evaluated based on the provincial curriculum expectations and the achievement levels outlined in the ministry document.

Expectations are organized into four categories of knowledge and skills. The categories and their corresponding weighting is as follows:

Knowledge and Understanding	35%
Thinking	15%
Communication	15%
Application	35%

Each student's final mark will be in the form of a percentage grade based on their achievement in the 4 categories on the achievement chart. The breakdown of the final mark is as followed:

Term Evaluation	70%
Final Evaluation	30%

The final Evaluation will be completed during the final 6 weeks of the course and may include a variety of summative activities including an exam, a presentation and final project.

In addition to students' performance in the achievement categories, students will also be assessed on their performance in the following learning skills:

- Responsibility
- Organization
- Independent Work
- Collaboration
- Initiative
- Self-Regulation

For specific policies on assessment and evaluation, and academic honesty, please refer to *School Procedures* in the student agenda.

Overall Course Expectation



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By the end of this course, students will:

- identify and explain the functions of basic components of a typical computer and peripherals;
- assemble computer systems, configuring system boards, installing operating systems and configuration;
- understand systems for internal representation of information including binary, decimal, and hexadecimal number systems and their relation to computer logic;
- develop an understanding of logic gates, integrated circuits, Boolean algebra, truth tables, and computer data processing;
- basic knowledge of robotics design, and building different robotics parts: chassis, motor, sensor, movement control and power supply;
- fundamental structures of programming, including variable declarations, assignment statements, input/output, selection, looping, arrays, subroutines, and parameter passing;
- design, build, and operate interfacing systems;
- apply hardware and software knowledge to design and build components for communicating between computer and the microcontrollers;

Unit Summary

Unit Title	Approx. # of Hours
Unit 1: Hardware/Software/Operating Systems	5
Unit 2: Digital Logic and Electronic Circuits	15
Unit 3: Robotics Design	30
Unit 4: Computer Programming	15
Unit 5: Robotics Building	45

Classroom Expectation

- Academic Honesty – Students are expected to be academically honest by submitting their own original work, and the mark received is intended to reflect their own academic achievement.
- Online Code of Conduct as in the school agenda or http://www.tdsb.on.ca/communications/code_of_online_conduct/occ.html
- Respect for Property – no food or drink in the lab
- Policy on late or missed evaluations as in the school agenda