

Technology Education – Robotics 1

Mark T. Sheehan High School

Year 2017-2018

Teachers: Mr. Czarnecki

E-mail: aczarnecki@wallingfordschools.org

Software: Robot C

Room: E114

Phone: (203) 949-6591:5929#

Developers: VEX Robotics

Course Description:

We live in a world that is increasingly dependent on automation and robotics to meet the demands of manufacturing, experimentation, and research and development, amongst many other fields. Students in this class will be exposed to the emerging technologies, principles, and problem solving incorporated into this field. Students will use software to program custom built robots to suit specific needs and challenges. Using science, technology, engineering, and mathematics (STEM) students will build complex electro-mechanical systems that move independently and perform pre-programmed tasks.

Course Objectives:

- We depend on technology to improve our lives and the world around us.
- Social and economical factors influence technological developments.
- Automation and robotics requires accuracy and high standards of quality control in order to be safely implemented.
- Many mechanical skills are required in combination to achieve a functioning product.
- A clear plan is crucial to a successful execution.
- Media outlets help communicate technological solutions.
- The design process is necessary to program and build valuable robotic systems.
- Refinement is the key to continuous correct function.
- Motors are used to produce “work.”
- Gears are used to change available amounts of torque and speed coming from a motor.
- Torque is inversely proportional to speed.
- “Programming” is a set of instructions required by all computerized systems.
- Accurate instructions are essential to the proper functioning of a computer system.



Instructional Methods:

Lectures, demonstrations, laboratory activities, cooperative learning, learning within a module, peer instruction and mentoring, field trips and guest speakers.

Instructional Materials:

Arduino Circuit boards, Raspberry Pi Circuit Boards, Online Learning, Google Slides, Quizzes, Tests & instructional videos.

Class Schedule: Full Year, 2 to 3 days per week, 56 - 72 minute periods.

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CURRICULUM OUTLINE

This outline may be modified as the course proceeds and does not necessarily reflect the actual order of topics to be discussed. Realizing that students are beginning this class at different levels of understanding, I will try to accommodate that as much as possible.

Introduction

- A. Classroom rules & norms
- B. Review of syllabus
- C. Unit 1: History & Overview of Robotics in the World Around Us
- D. Unit 2: Simple Machines: Motors, Gears and Simple Machines
- E. Unit 3: Claw Bot: Design and Assembly
- F. Unit 4: Modification and Programming
- G. Unit 5: Custom Builds: Robotic Challenge



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Evaluation:

Student evaluation will be based upon attendance, the successful completion of quizzes, a midterm examination, a final examination, student presentations, and lab experiences. The percentage that each of these course components contribute to final grade is listed in the table below.

Course Component:	Percentage of Final Grade:
Quizzes	15%
Unit & Tests	15%
Homework	10%
Projects	50%
Participation	10%

CLASS COMMUNITY NORMS

The following expectations have been compiled by previous Mechatronics classes. Students are aware that school wide rules and policies also apply, as do the computer room rules listed below.

STUDENTS' EXPECTATIONS OF OTHER STUDENTS

- Show RESPECT for:
 - Other people when they are talking
 - Other's personal space
 - Other's property
 - Yourself
- HELP others
- COOPERATE
- COMMUNICATE problems, needs, ideas...

STUDENT EXPECTATIONS OF THE TEACHER

- Show RESPECT for students
- COMMUNICATE with students
- Provide INDIVIDUAL HELP to everyone
- Have PATIENCE

TEACHER EXPECTATIONS OF STUDENTS

- Show RESPECT for the teacher, each other, and the equipment
- COMMUNICATE problems, needs, ideas...□
- Have PATIENCE
- REQUEST HELP if you are having trouble (tutoring available)
- COOPERATE□
- Be ON TIME, and ON TASK throughout each class, and don't forget Web design is an ART.



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COMPUTER ROOM RULES

- No eating or drinking anywhere near computers
- Gaming while in class will **NOT** be tolerated **PERIOD** NO Games unless I approve them.
 - **1st offence is a warning**
 - **2nd Lunch Detention + Parent email home**
 - **3rd Office Detention + Phone call home + Email home**
 - **4th Parent & Teacher Meeting**
 - **5th Office Involvement *Guidance + Student + Teacher + Parents**
 - **6th Office Involvement *Vice Principal + Guidance + Student + Teacher + Parents**
 - **7th Office Involvement *Principal + Vice Principal + Guidance + Student + Teacher + Parents**
- Do not download anything from the internet that may jeopardize the computers.

Please return this sheet to Mr. Czarnecki by Friday, **September 8th.**

I have read and understood the requirements and policies of the Robotics 1 course.

Student name (PRINT) _____

Student signature _____

Parent name (PRINT) _____

Parent signature _____

