**Robotics 10**

Course Outline

Warman High School

Roxanne Bitner

**Big Idea:** Robotics 10 is an introductory course intended to give students a basic understanding of electronics, necessary mechanics, Arduino processing, and related terminology so that they can upload simple programs (called Sketches) to perform various operations. Initially, students will use logical sequencing, flow charts, and schematic diagrams to develop simple code so that they can upload programs into electronic /robotic devices. The final project will require that students incorporate all learning to build, program, and operate a device to be demonstrated.

**Module Outcomes:** This course has been established with closely to the new Robotics curriculum. The plan focuses on using the new Arduino programming systems that are proving to be cutting edge in many areas, including robotics. Grades are reported by module. Some assignments are for practice, and some are for marks. Records will be kept of all assignments to provide evidence of learning.

* This symbol indicates that the assignment will be counted for marks in the reporting period. Those assignments that must be done to show evidence of learning will not have this symbol but will be recorded. Projects are described in detail on the course website: rbclasses.weebly.com/Robotics 10

**Course Configuration and Assessment**

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| **Module #** | **Module Name** | **Activities / Assessment** | **Allotment (Hours)\*** | **Evaluation****(Overall %)** |
| 1 | Introduction to WHS Lab, the Media Drive, Assignment Procedures, and Robotics | ProceduresAccessing Information & AssignmentsCreating folders for hand-ins“History of Robotics” LessonBug Bots Electronics Introduction | 5 |  0% |
| 2 | Careers in Robotics | Exploration of CareersResearch a particular field and detail the requirements to work in that field and 8 different robots that have been invented or are in development.* Make a Power Point to share in class

Describe 8 options in chosen area | 5 | 10% |
| 3 | Safety | Discuss how and why safety precautions must be observed in a robotics lab (accident prevention and treatment), the importance of orderliness, and respect for peers.Demonstrate electrical safety procedures.* Make a safety brochure.
 | 4 | 10% |
| 4 | Electronics Basics/ Schematics | Snapino introduction to Arduino Use Snapino to build circuits and begin to understand coding* Breadboard Mini-projects – establish ten circuits (defined and created)
* Quiz - terminology
 | 9 | 15% |
| 5 | Introduction to Arduino / Flow Charts / Coding Basics | Practice making flow charts and electrical circuits with Arduino coding.* Complete, verify and submit flow charts and coding for five basic projects (checklist)
 | 10 | 10% |
| 6 | Control Structures / Data Types / Time/ Operators/ Digital & Analog / Functions | Practice builds and flow chart development.* Complete, verify and submit flow charts and coding for five complex projects.
 | 10 | 10% |
| 6 | Mechanical Basics | Research a variety of mechanical devices that are used in robotics development.* Quiz – terminology
 | 5 | 5% |
| 7 | Build a Device – Mechanical / Electronics | Practice procedure to make a project* Construct a device and prove that it is operational (rubric)

Peer/Self-assessment | 8 | 15% |
| 8 | Sensor Coding | Explore how to use sensors to enhance devices – individual project.Research and select a multi-modal project that uses at least one sensor.* This is planning for the final project.

Three-part project plan to be graded prior to beginning the final project. | 7 | 5% |
| 9 | Final Project | * Inquiry Project – students use learning from all units to develop an interesting way to program a device that demonstrates learning in the course (rubric). At least one sensor must be used.

Self-Assessment/ and Rubric | 15 | 20% |
|  | Total |  | 78 | 100% |

\* Number of dedicated hours is an estimate and will be influenced by student need.

**Assessment for Learning:** Students will have a conference with the instructor to explain what and how they are learning. Assessment will take the form of class discussions (electronics, mechanics, programming logic), visual representations (flow charts, schematic drawings), constructive quizzes (electronics, mechanics), constructions projects (circuits, Sketches: Arduino coding term for completed code), demonstration of understanding with physical equipment (breadboard circuits, coding a response, and developing original code), and peer/self-assessment. The final project will demonstrate the cumulative effect of learning in the course.

**Classroom Expectations Overview**

1. Respectful and polite conversation is the only acceptable standard.
2. ABSOLUTELY NO FOOD AND DRINK is allowed in the core of the lab during class (including eating from food in a backpack). Any visible food or drink (open or not) MUST be kept at the front of the lab on the table.
3. All students are expected to be working on only one machine that is logged in on their own name.
4. All students are expected to be working at completing Robotics assignments.
5. Students are encouraged to offer verbal assistance to a nearby peer during working time, but are not allowed to physically do any of the work for them or enter within their personal space.
6. Monitors are not to be turned or tilted. If you want to show your work to someone else, you must have them come to your monitor to view it. Do not turn the monitor towards them!
7. Hats are allowed. Hoods/earbuds/earphones cannot be worn during instruction. Otherwise, hoods are acceptable. Earbuds/earphones can only be used to listen to audio provided on the website by the teachers. This is a collaborative class so listening to music is not an option.
8. All assignments are due as indicated by the teacher. Late assignments will result in the teacher expecting the student to work in the lab after school to catch up (as arranged by student). Due dates are to be honoured. Late assignments will receive a mark of zero immediately and the parent notified the next day. A student can discuss a plan for completion with the instructor. Rewrites of quizzes are not an option.
9. Personal devices cannot be used for any purpose not expressly determined by the instructor (i.e. texting, phone calls, social media, games).
10. Students are expected to adhere to digital citizenship guidelines as good stewards of the school's resources and equipment.
11. Safety practices must be observed at all times. Goggles/glasses must be worn while working with equipment or soldering.
12. It is required that students must have a mask on their person at all times, and must wear the mask if within 6 feet of another person. This is most of the time since space is limited in the lab.