Arduino:
Beginner Programming and Robotics

Tutor:
Mrs. Monika Lambert
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Prerequisites:
- This course is open to 8th – 12th grade students.
- No previous programming or electronics knowledge is required for this class!

Course Description

This course uses a hands-on, project-based approach to learning the Arduino platform. In this course, students will build projects such as: motion sensor alarm, light-activated night light, LED disco strobe light, Arduino piano that can play different songs, digital thermometer, ultrasonic robot, Arduino game projects using light, sound, and joysticks including PONG, and much much more...

Students will learn about and become proficient with the following components and understand exactly how they work as they will be incorporated into projects: Breadboards, LEDs, Active and Passive Buzzers, Switches, Potentiometers, Transistors, Ultrasonic Sensors, Piezos, Infrared Receivers, Joysticks, 8x8 Matrix LEDs, Shift Registers, DC Motors, Servos, LCD Screens, and much much more...

The course will be broken up into a Basic Arduino Knowledge section, Simple Projects section, Intermediate Projects section, and an Advanced Projects section allowing students to progressively level up throughout the year.

Books & Supplies
- **_Arduino Project Handbook VOLUME 2_**
  - ISBN - 1593278187 (blue book)
- ELEGOO UNO Project Super Starter Kit with Tutorial and UNO R3 (click for direct link)
- Laptop (PC or MAC only) needed in-class weekly. (Chromebooks will not work for this class.)
  - Students must also be able to download provided .zip folders.
- FREE Arduino account
- FREE Arduino IDE software for PC or MAC
- FREE Tinkercad account
- Any extra build pieces will be provided by Mrs. L and covered by the lab fee.

Commitment
- This course meets on Tuesdays.
- Homework time will be based on each student's build ability and how much he/she can recall from class.
- Homework lessons are all online and must be shared via Google Docs. All homework is only 5 questions per lesson.
- Coding - Mainly throughout the first quarter, there may be a few coding assignments to reinforce the class lesson and to review/study for upcoming quizzes. (Participation grade)
- Arduino Builds - Although Arduino projects are aimed to be finished in class, some projects may require students to work from home in order to answer homework questions.
- Arduino Worksheet - After every lesson/build, there is a corresponding questionnaire that is given for homework.
- See Mrs. Lambert for specific homework due date requirements.

A typical class will look like...

Introductions to new lessons will take up the first 20-30 minutes of class, depending on the subject. The rest of the class time will be spent on project completion and individual Q&A sessions.
After the allotted class time, students who need more time to complete projects must have the ability to work at home.