WEST ISLIP HIGH SCHOOL

ENGINEERING TECHNOLOGY DEPARTMENT

Basic Electricity/Electronics

Course Description:

This course investigates the fundamental concepts of electricity and electronics that involve direct current (dc), alternating current (ac), series and parallel resistive circuits, magnetism, inductance and capacitance. Students will conduct a series of lab experiments that will explore the nature these electrical fundamentals. Students will also use Arduino Microcontroller boards to apply digital capabilities to problem solving tasks. An introduction to the coding language C will be provided as a means to instruct the Arduino microcontroller boards to execute defined tasks. Hands-on experiments and projects will act as the strategy for understanding microcontroller processing.

Course objectives:

- Understand basic units of electrical quantity (voltage, current, etc...)
- Understand basic electrical relationships (Ohm's Law, series and parallel circuits)
- Read, interpret and design electrical circuit diagrams.
- Identify and use different electronic components.
- Develop the hands on skills needed to design, construct and test electrical and electronic circuits.
- Students will learn the basics of using an Arduino.
- Students will implement basic programming principles.
- Students will experience the entire project life cycle.
- Describe the basic function of a Arduino microcontroller board
- Configure the Arduino IDE to communicate with the Arduino hardware
- Use the Arduino IDE to load, compile, download and execute programs
- Describe the basic structure of an Arduino program

- Use discrete components on a solder less breadboard with an Arduino
- Locate the resources available on the Arduino website

Course Requirements:

Students are required to be in class on time, in their seats and ready to work when the bell rings. You must maintain a NEAT notebook and keep all handouts, past quizzes and tests. All lab work must be submitted for grading on time. No credit for missing work will be awarded and late work will be penalized. You are responsible for maintaining a passing grade to receive credit for the course.

Grading Criteria:

1. Tests, Quizzes and Lab projects. 70%
2. Class Participation, Homework and Notebook 30%

Needed Materials:

1. A one-inch three-ring binder with filler paper and pocket inserts.
2. Pencil and eraser.
3. Calculator (Important!)