SMS 416- Sensor project 1 – Due Feb. 27th (at the latest, can submit earlier).

Build (individually or as a group of two) a sensor circuit of your choice on a breadboard from electrical components that can sense a property of the environment (e.g. temperature, light intensity, number of objects crossing a door threshold etc'). The sensor will be powered by battery or other power source (your computer in the case of Arduino). Measure the response of the sensor to the environment by having and LED flash at a rate that varies with the conditions (e.g. more flashes at higher temperature, light intensity, a flash everytime an object crosses the door, etc'). If you don't have an idea for a sensor please come see us.

Make sure to understand the role of every component in your circuit. Learn how to measure current in the circuit, voltage across a component in the circuit and the resistance of components in the circuit with a multi-meter.

If applicable, calibrate the sensor against a 'standard' (that is using a calibrated sensor or some other known quantity) over a reasonable range of environmentally relevant values. Derive a calibration equation by plotting number of flashes compared to the reading by the 'standard' and assess likely uncertainty of sensor (e.g. +/- 2degrees) by looking at the dispersion of the points from the calibration curve.

Together with the Emmanuel Boss and/or Jim Loftin test your sensor and assess how well the sensor performed.

Submit a report which includes a short description of your sensor, the calibration data graph + the 'mystery' data (test case we will use to test sensor performance), and a photograph of your sensor.

Grading: late submissions, a grade down down per class period passed.

Rubric:

A	Sensor works, calibrated well and performs well in test (A- if minor details missing).
B	Sensor works, calibrated well but fails in test.
C	Sensor works, did not calibrate well and fails in test.
D	Sensor seems to respond to the environment but it is not obvious what the sensor is doing.
E	Some components are attached but no output is measurable.