# TCES 455, Autumn 2016

# Laboratory 6: Initial robot

In this lab you will have a few steps and you will have three (3) weeks to complete. The demonstration day for this lab will be during class and lab time on 11/22. Grading will be conducted by group reveiw, peer review and faculty review.

At this point you can use any libraries and built-in functions to make this work. You have free license to use anything available to accomplish this project. You will be provided the basic materials necessary to complete this project. However you are not restricted to only using the materials provided, please feel free to improve your project in any way you would like. As long as you meet all of the requirements of the project. You will not be turning in your code; but you will need to include it as part of your appendix for the Lab Report.

**Lab Report:**

You will be required to turn in a formal Lab Report for Lab 6 and Lab 7 in the same repot. It will be due on 12/15, you can follow the example on canvass.

## Part 1: Design

The first part will consist of you making a basic “car” robot that will use the Ultrasonic Sensor to avoid obstacles. The challenge for this part:

* Use the NXT LEGO Robotics kit to build your robot.
* Control your robot with your Arduino using the Bricktronics NXT/EV3 shield.
* It must stop 6 inches before it hits an object in its path.
* It will back up 6 inches into the circle on the floor. Staying inside the circle, look left and right (can be right then left) to find the “Most Open” path to take and go in that direction.

**Part 2: Final design**

For the final design you will have to incorporate two more sensors, the Light sensor and the IMU.

* Add the two sensors to your robot you used for part 1.
* Do the Part 1 challenge again.
* Using the Light sensor to find the circles in the given shade of grey.
* Upon finding the proper group of circles, you will use the IMU to find the magnet that will be under one of the circles.