

**Department of Electrical & Computer Engineering  
ECED – 3901 Design Methods II**

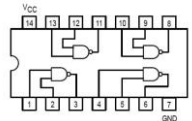
**Assignment #1**

**Due: May 21, 2015 @ 12:30 PM - Submitted via BBLearn Website (PDF files only), OR printed files in 3901 Mail-Slot at ECED Office**

1. Identify at least five attributes or functions you think the robot should have. For each one list:
  - a. Detailed description
  - b. Pros/Advantages of selecting that function/attribute (i.e.: allows detection of item X, easy to implement, something you are already familiar with)
  - c. Con/Disadvantages of selecting that functions/attributes (i.e.: complex, difficult to implement, have no idea how to use it (so will require lots of research))
  
2. Think about different sensors you might be using (light sensor, metal sensor, etc.) to detect obstacles and objectives on the playing surface. Generate a table with the following headings, list at least three sensor types. I've given you an example row with a sound sensor (which IS NOT part of your kit) as an example:

Sensor Type	What you know about it	Where to find additional information	Strengths	Weakness
Sound sensor	Detects sound in range 20Hz-10kHz	-Device datasheet (on BBLearn) -Appnote AN9292 from vendor -Blog post at <a href="http://www.???/stuff">http://www.???/stuff</a>	-High sensitivity -Example designs available	-Requires complex drive circuit -Narrow field of view

3. Based on one of those sensors from **Q2** OR one of the features from **Q1**, describe a basic proof-of-concept test you could do to give you more information or help answer some questions/unknowns. This should be a simple test which you could accomplish in a few hours or less – even 15-min experiments are OK, provided they give you a useful piece of data!
  
4. On BBLearn there is a list of parts in the design kit (see “Content→Technical Details and Downloads”). Select ten parts (that ARE NOT resistors, capacitors, or LEDs) and generate a table with the following headings; I've given you an example for one of the gates.

Part #	Function	Features	Important Parameters	Schematic	Notes
74LS00	NAND Gate	-4 gates in package -High drive strength	-Vcc =5V -Low-level Output = 10mA -High-level output = -1mA		-5V logic -Useful for interfacing things