EE40Lx – Lab Parts Kit – Rev 1.2 (Dec. 24, 2014)

Introduction

EE40Lx revolves around the construction of a bouncing robot powered by the MSP430G2553 LaunchPad. The construction of the robot project constitutes an optional, peer-reviewed part of the course worth 40% of the overall score.

Recommended Equipment

Access to the following equipment is highly recommended to enable debugging of circuits on the robot:

- Digital multimeter (myDAQ or alternative)
- Oscilloscope (myDAQ or alternative)

Students who can use these measurement tools will find it much easier to debug the circuits they build in the course. Digital multimeters are inexpensive and having one is highly recommended for anybody with an interest in electronics. Oscilloscopes more expensive, but inexpensive options are available. Purchasing a myDAQ or joining a shared community lab space are cost-effective alternatives to purchasing your own oscilloscope. Other alternatives can be found on the student-curated course Wiki.

myDAQ Information

Those who do not have access to an oscilloscope or a digital multimeter might consider purchasing a MyDAQ to enable measurements. The video modules use the MyDAQ and the NI Ultiboard as measurement equipment to help debug the circuit. National Instruments has made available the MyDAQ and NI Ultiboard as a bundle, as well as the NI Ultiboard alone for students enrolled in this course. The myDAQ ordering page is: http://www.studica.com/us/en/BerkeleyMOOC.html

Microcontroller

We recommend using whichever microcontroller you like to follow along with the course. We will be using the MSP430G2 LaunchPad and will be supplying code samples for this platform. However, you are welcome to bring another microcontroller like the Tiva C LaunchPad or Ardunio if you are comfortable writing simple programs for them.

Parts Kit Purchase

The parts included in the construction of the robot can be purchased at the Newark page.

- All regions: http://www.element14.com/community/community/designcenter/learning_center/edxucb-bridging

For students interested in sourcing their own parts from other distributors, the complete parts list with manufacturer information is listed below. There is also a student-curated list of substitutions on the course Wiki.

Electronic Parts

Qty	Part	Manufacturer	Man. Part #
1	Solderless Breadboard	MULTICOMP	MCBB400
1	Green LED 2.1V 20mA 5mm	MULTICOMP	MCL053GT
1	Red LED 2.1V 10mA 5mm	MULTICOMP	MCL053PT
1	Yellow LED 2.1V 20mA 5mm	MULTICOMP	MCL053YD
1	OPA4344 Quad Amp (DIP)	TEXAS INSTRUMENTS	OPA4344PA
1	OPA2344 Dual Amp (DIP)	TEXAS INSTRUMENTS	OPA2344PAG4
1	9V Battery	ENERGIZER	EN22
1	9V snap connector	KEYSTONE	234
1	LM1086 3.3V Regulator	TEXAS INSTRUMENTS	LM1086CT-3.3/NOPB
2	STANDARD DIODE, 1A, 50V, DO-41	MULTICOMP	1N4001
2	BC547 (NPN transistor)	FAIRCHILD SEMICONDUCTOR	BC547B
2	DC Motor	ADAFRUIT INDUSTRIES	711
2	Photocell	EXCELITAS TECH	VT90N1
2	RESISTOR, METAL FILM, 300 OHM, 250mW, 1%	MULTICOMP	MF25 300R
3	RESISTOR, CARBON FILM, 1KOHM, 250mW, 5%	MULTICOMP	MCF 0.25W 1K
2	RESISTOR, CARBON FILM, 10KOHM, 250mW, 5%	MULTICOMP	MCF 0.25W 10K
7	RESISTOR, CARBON FILM, 2.7KOHM, 250mW, 5%	MULTICOMP	MCF 0.25W 2K7
1	RESISTOR, CARBON FILM, 100KOHM, 250mW, 5%	MULTICOMP	MCF 0.25W 100K
1	Piezo Buzzer	MULTICOMP	MCKPT-G1340-3917
1	Electret mic	PRO SIGNAL	ABM-707-RC
2	CAPACITOR ALUM ELEC 10UF, 16V	MULTICOMP	MCGPR16V106M5X11-RH
2	CAPACITOR CERAMIC, 1UF, 25V, Y5V, +80	VISHAY BC COMPONENTS	K105Z20Y5VE5TL2
1	MSP430 LaunchPad	TEXAS INSTRUMENTS	MSP-EXP430G2
1	Wire Jumpers (male-male pack of 65)	MULTICOMP	MCBBJ65
1	Wire Jumpers (female-male pack of 10)	MCM	21-14551

Mechanical Parts

Qty	Part	Manufacturer	Man. Part #
4	CABLE TIE, NYLON, 190.5MM L, 50LB, NATURAL	THOMAS & BETTS	L-7-50-9-C
1	Jumbo wooden craft sticks, 6"Lx3/4"Wx1/16"H (75 pcs), ~6-8 needed	Hobby Lobby/ Local Hardware	166033
2	Conical Compression Spring, 1.00" Long,.720" Large OD,.281" Small OD,.042" Wire	McMaster-Carr/ Local Hardware	1692K55
2	3/8”-16 thread nuts	McMaster-Carr/ Local Hardware	90473A031