

Request for Project Proposals – ECSE 1010 (Updated 16 November 2016)

1. Cannot just build and turn it on. Anything complicated must be done in stages with testing as construction progresses.
2. Designs should be modified in some manner to show that the device can work under two quite different conditions. (e.g. pulse at different rates, operate with different power supplies ...)
3. Example Projects
 - a. Holiday Lights
 - b. Some kind of system controlled by Analog Discovery measurements using either Python or Matlab to control some output
 - c. Some kind of experiment monitored by the Data Logger in Waveforms
4. Must be based on content from this course.
5. Should be fun and of interest to student
6. Can be an experiment designed to show some physical principle (does not have to be electrical).
7. Pre-proposal due in one week.
8. Follow ECP protocol: Include information on fundamentals, simulation and measurement.
 - a. Exploring a concept you have seen before, as we did with circuit content from K12. Can be from any course or activity as long as it involves some circuits/electronics.
 - b. Exploring a new concept based on what we have learned (transformers, start with Joule Thief ...)
 - c. Instrumenting some commercial electronic device (like the solar dancers from the dollar store)
 - d. Building a project found online and modifying it for a purpose.
 - i. Transistor pulser. (We did one type of transistor pulser that required changing at least one resistor to handle a different power supply than was used in the original project).
 - ii. 555 switch debouncer (This is project 3 from Electronic Instrumentation – It requires learning what switch debouncing is and how a 555 timer can be used to reliably count pulses with bouncing.)
 - iii. Clapper? (Need to learn about a new device: flip-flop, a key digital device and also apply a similar principle to the switch debouncer)
9. Hardware/Software Options
 - a. No matter what you build, you must use Analog Discovery to measure key voltages in the circuit. In your final report, you must use your measurements to provide some kind of explanation of how your device/system works. You do not need to provide a perfect explanation.
 - b. Arduino or other processors: If you own an Arduino, a TI Launchpad, Raspberry Pi or any other processor, you are free to use them in your project.
 - c. Software: It is permitted to use any software (programming language) and to have your project be mostly software but there has to be some kind of hardware and circuit components involved. For example, you can program an Arduino to provide some kind of functionality, but you need to actually build and test the thing you are controlling. It does not have to be complex, however.
 - d. Kits: It is OK to purchase a kit of some kind, build and test it for your project. Look on Prof. Connor's web page under **Educational and Project Tools & Info** for links to sites

that sell kits. You may also find ideas for projects that you can follow up on by searching for plans to build without purchasing a kit.

Sample Projects

Altoid Tin Morse Code Oscillator (has many design issues that need to be resolved)

<http://forum.hackedgadgets.com/viewtopic.php?t=976>

LM386 Audio Amplifier <http://www.instructables.com/id/LM386-Audio-Amplifier/>

Or possibly <http://hackaweek.com/hacks/?p=131>

555 Timer Projects <http://www.instructables.com/id/47-projects-to-do-with-a-555/> or <http://makezine.com/2012/08/24/555-timer-weekend-projects/>

Touch Counter <http://www.redcircuits.com/Page163.htm>

Electronic Candle Blowout <http://www.redcircuits.com/Page122.htm>

Capacitive Sensor <http://www.redcircuits.com/Page22.htm>

Clap Relay <http://www.redcircuits.com/Page88.htm>

LED Projects (some are good, some are not)

<http://talkingelectronics.com/projects/30%20LED%20Projects/30%20LED%20Projects.html>

More Project Ideas

Many will fit in an Altoids box

<http://www.instructables.com/id/Automatic-street-Light-1/> Probably not complex enough.

<http://www.instructables.com/id/Economy-Flashlight-1/>

Engineering Student Project Ideas

<http://www.electronicshub.org/electronics-projects-ideas/>

Matlab Projects

<http://1000projects.org/matlab-projects-for-students.html>

<http://www.electronicshub.org/matlab-projects-for-engineering-students/>

Easy Electronics Projects (found by searching for this phrase) A few of these may be too simple, but most are just fine.

<http://www.eleccircuit.com/easy-electronic-projects/>

<http://circuiteasy.com/>

<http://www.instructables.com/id/Beginners-Electronics-Projects/>

<http://circuitdigest.com/electronic-circuits>

<http://www.electronicshub.org/electronics-mini-project-circuits/>

<https://turbofuture.com/consumer-electronics/Getting-Started-Top-10-Small-Electronics-Projects>

<http://www.buildcircuit.com/5-beginners-projects-that-work-in-the-first-attempt/>

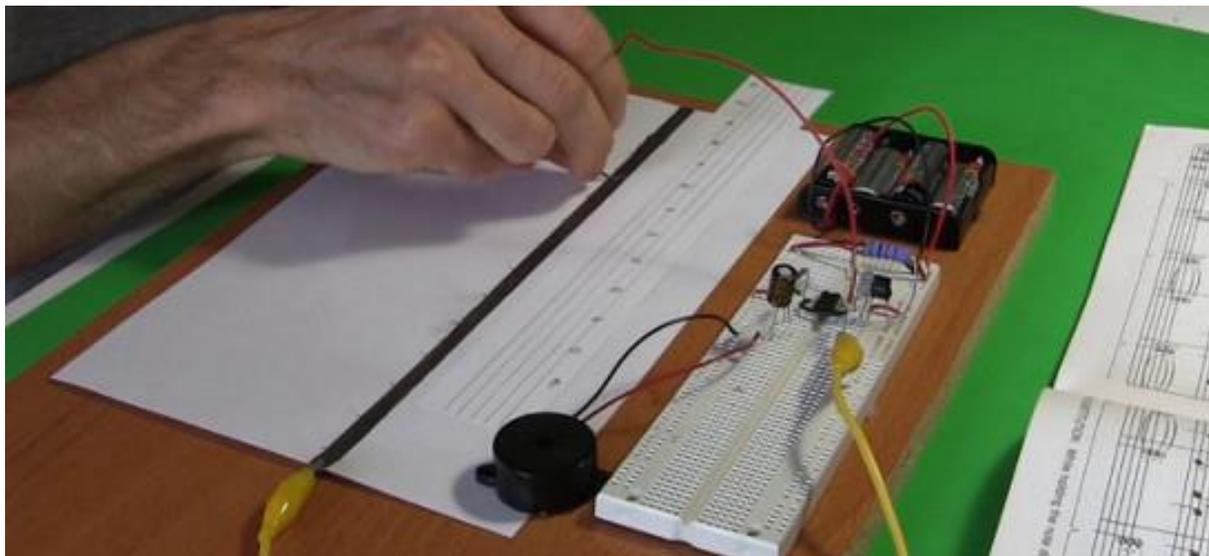
<http://www.circuitstoday.com/simple-electronics-projects-and-circuits>

<http://electronicsproject.org/>

<https://www.elprocus.com/latest-electronics-projects-for-eee-and-ece-projects-in-2014/>

http://rimstar.org/science_electronics_projects/

This last reference has a 555 Timer Musical Instrument made by creating a variable resistor with pencil lines. There is a very informative YouTube video <https://www.youtube.com/watch?v=rTmlR8B-u5c>



Also check YouTube for 'simple electronics projects for beginners' and similar phrases.