

**ECE 3150: Microelectronics**

**Spring 2016**

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**Lab 4 (OPTIONAL)**

**Due on or before May 13**

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**Lab Goals**

The goal of the lab is to give you the opportunity to design and demonstrate a circuit of your liking and get bonus points from it and these bonus points could contribute towards your final course grade.

**The lab is open ended:** This means that you can design and demonstrate any transistor circuit that meets the following requirements: i) The circuit type is not covered in any of the previous labs, ii) The circuit is of sufficient complexity (simple CS, CG, CD stages will not do), iii) The circuit makes use of the concepts used in this course, iv) The circuit can be assembled from the components and chipsets available in the 3150 lab.

**Teams:** You can work in teams of not more than two.

**Requirements and deliverables:** This lab does not require you to hand in any write-ups. All you need to do is:

- 1) Submit a schematic of the design of the circuit that you or your team would like to build. Indicate in this submission the quantities and specs you will measure and demonstrate in the lab in order to show that your circuit works. Your proposal would need to be pre-approved by me. You can make this submission via email between now and May 13. Of course, the sooner you do it the more days you will have to work on it.
- 2) Build the circuit in the lab, measure the specs, and demonstrate that things work close to what was intended. This demonstration can be made to any course staff member on or before May 13 (TAs or me) during the lab hours. You will have to explain during the demonstration how your circuit works.

**Lab schedule and support:** Since all course students are not expected to do this lab, you can work on this lab during the regular lab hours on any day of the week (first come basis) and spend as many days on it as you like. You can also work on Tuesdays. Note that since the lab is open ended TA support would be limited. Also, your circuit board will be kept in a safe place in the lab so that you can continue working on it over multiple days if you want.

**Examples of circuits you can demonstrate and the points awarded:** Examples are differential amplifiers, differential amplifiers with current mirrors, RF mixers/modulators, etc (FETs based on chipset ALD1105), bipolar amplifiers, bipolar RF mixers/modulators (bipolars based on chipset CA3096), or something completely out of the course material, like FET or bipolar flip-flop circuits. The points awarded will depend on the complexity of the circuit and the progress made in successfully completing the demonstration.

### **Pre-Lab Work**

Submit to the instructor (via email) a schematic of the circuit you intend to build and the quantities you intend to measure in order to demonstrate that your circuit works. A scanned hand drawn document will do.

### **Lab Work**

Build your circuit and demonstrate its workings to a course staff member.

### **Post-Lab Work**

Enjoy the ECE day and the slope day. There is nothing to submit.