

IC Design Project

The class will be divided into groups of 4-5 people. You and your group will design, fabricate, and test an MOS circuit. During the first 3-4 weeks of class, you will use L-Edit to design your masks. We will then have the masks made, and you will have the remainder of the quarter to fabricate and test your circuit. At the end of the quarter, you will turn in a final report on your project as well as give an oral presentation during finals week.

Circuit design: The choice of what type of circuit you want to design will be largely left up to you. Past students have designed logic gates, MOS amplifiers, adders, TIA's, CCD's, shift registers, and many others. Because of the time constraints, I recommend keeping your design relatively simple. Before beginning your circuit layout, make sure to do a hand analysis and/or simulate your circuit. You will use L-Edit software to design your masks. L-Edit is installed on computers in the ECI lab. Also, I have written a small tutorial to help get you started. **MAKE SURE TO INCLUDE TEST STRUCTURES IN YOUR DESIGN!!!** Other considerations to take into account are how are you going to realign subsequent layers to your first layer, and how large do you want the entire layout to be.

Fabrication: You will fabricate your circuits in the teaching cleanroom using the same equipment from last quarter. This quarter, another class will also be using the cleanroom, and equipment sign-up will follow the same procedure as before.

Final Report: Your final report should detail not only your simulations and circuit results, but also your process, including test structures and other analyses you performed during your processing. Whether or not your circuit works in the end, the most important aspect of your report is to detail why it did or didn't work, what are the factors that have the largest impact on performance, and what should be improved. Keep in mind that in reality, integrated circuits rarely work the first time around, so it is important to determine what needs to be improved in order to make them work the next time.

Important dates: April 7: Project proposal due
April 22: Turn in L-Edit TDB files
June 9: Oral presentations
June 10: Reports due by 5pm