

ECEn 550 – MEMS  
Fabrication Lab  
Week 1  
“Safety and KOH Etching Prep”

**Description**

This week you will review safety guidelines required to enter the cleanroom as well as fundamental cleanroom guidelines. We will also review the lab requirements, grading policy, necessary notebooks, etc. We will initially meet in the conference area of room 494 of the Clyde Building for these discussions. Included at the end of this document are pre-lab instructions for your Week 2 exercises that must be completed before next week’s labs.

**Major Objectives**

1. Lab Notebooks, Reports, Grades

We will begin by discussing the basic requirements of the fabrication section of the lab exercises. These will include keeping a lab notebook and writing a report at the end of the semester summarizing your laboratory results. Your grade will be based on both of these activities.

2. Safety Discussion and Video

This objective will deal with laboratory safety, especially dealing with chemicals used in the cleanroom during microfabrication. We will discuss basic safety procedures including handling hydrofluoric acid. You will be shown a short safety video.

3. Read Cleanroom Protocol Pages/Complete the Safety Tutorials

In this objective, you will be required to read the safety and protocol sections found on the cleanroom websites: [://cleanroom.byu.edu/access](http://cleanroom.byu.edu/access). (safety) and [://www.ece.byu.edu/cleanroom/safety\\_protocol.phtml](http://www.ece.byu.edu/cleanroom/safety_protocol.phtml) (protocol)

The safety link points you toward 4 online tutorials (do not do the annual exam). Open up each tutorial, read the material, and complete the test at the end. If you have any problems with them, contact Jim Fraser @ 801-422-4344. They must be completed, however, before Week 2’s lab or you will not be allowed to enter the cleanroom (this does not apply to you if you have previously been granted cleanroom access). The protocol link sends you to a page with a number of headings. Open and read or view the information under the headings:

1. Acid Safety (watch the video)
2. Emergency Contact
3. Housekeeping and Cleanroom Etiquette (watch both videos and read the subsections)
4. Gowning ( watch the video)

4. Prepare for Week 2’s lab exercises.

Your next fabrication lab will be based on the KOH anisotropic etching of silicon. To get you ready for this exercise, you will use a computer program to model the effects of KOH etching after starting with a variety of etch masks. To access the program, go to the following website:

[mass.micro.uiuc.edu/research/completed/aces/](http://mass.micro.uiuc.edu/research/completed/aces/). This site will have a description of how to use the program

and will allow you to download a free copy of it. Determine how an etch will evolve on (100) silicon for the 5 mask opening shapes below. Print out some pictures of the shapes at different etch depths and glue them into your lab notebook. The more thoroughly familiar you are with how etching progresses, the better off you will be in Week 2.

