UNIVERSITY OF CALIFORNIA
College of Engineering
Department of Electrical Engineering
and Computer Sciences

C. SPANOS **Special Issues in Semiconductor Manufacturing** **EECS 290H**
K. POOLLA **Fall 2003**

1. **Choose a project and email Prof. Spanos a 200-500 word abstract by 5pm Thursday 10/30/03**
2. **Email a two page progress report by 5pm Thursday 11/20/03**
3. **Final Project report due by 5pm Monday, 12/1/03**
4. **Project Presentations planned for Tuesday/Thursday, 12/2-4/03**

What follows is a list of suggested course projects. You can also suggest your own project, as long as it is distinct / complementary to your main research subject. You should see me for references and other details.

Proposed Projects:

1.Employ SPC on: Litho, dry etching, LPCVD, metrology, etest, etc.
For example: do a precision/repeatability analysis of the newly installed CD-SEM in the Microlab. Or, choose another metrology system that is relevant to your research, analyze its error and repeatability, and establish a periodic test that can be used to confirm its accuracy.

2.Produce and analyze a response surface model for a process of your choice.
This project will involve modeling a semiconductor manufacturing process using classical response surface methodology. The investigation is usually done in three stages, starting with a simple two-level factorial screening experiment, followed by a more complex experiment that leads to a quadratic surface. During the final stage the surface is explored using "canonical analysis" in order to improve the process. An excellent candidate for this work is the DUV patterning, or the CMP process in the Microlab.

3.Model and Improve a Process of your choice using the Robust Design Methodology.
In this project you will use Taguchi's orthogonal array to explore a process and improve on it. After you pick a process to study, you will have to decide on the important variables and their levels. You will also need to decide on the key process "performances" that must be understood and optimized. After the completion of the experiments, you will build a model, find the "optimum" input combinations and confirm the improvement by completing the confirmation experiment.

4.Propose your own Statistical Process Control project
Design, *apply* and discuss an SPC procedure in your research domain. Use *actual* data.

5.Propose you own Experimental Design project
Design, *execute* and analyze an experiment in your research domain. Use *actual* data.

6. Propose your own project that uses the statistical concepts that we discussed in this class.

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