

## ELEG 5293 - INTEGRATED CIRCUITS FABRICATION LABORATORY

Spring Semester, 1995

Catalog Data: 1995-96 ELEG 5293. Integrated Circuit Fabrication Laboratory. Credit 3. Experimental studies of silicon oxidation, solid state diffusion, photolithographical materials and techniques, metallization, bonding and encapsulation. Fabrication and testing of pn diodes, NPN transistors and MOS transistors. Corequisite: ELEG 5213.

Textbook: W. R. Runyan and K. E. Bean, Semiconductor Integrated Circuit Processing Technology, Addison Wesley, 1990.  
Integrated Circuit Fabrication Laboratory Manual, 3rd Edition, W. D. Brown, H. A. Naseem, Department of Electrical Engineering, University of Arkansas, 1992.

References: VLSI Fabrication, S. K. Ghandhi.  
Modern Semiconductor Fabrication Technology, Gise and Blanchard.  
VLSI Technology, S. M. Sze.

Coordinator: H. A. Naseem, Professor of Electrical Engineering.

Goals: To introduce the students to the basic materials, processes and equipment used to fabricate and test integrated circuits.

### Prerequisites by Topic:

1. Basic laboratory procedure and safety.
2. Basic chemistry.
3. Basic solid-state physics.
4. Differential equations.

### Topics:

1. Laboratory safety and cleanliness. (1 class\*)
2. Silicon wafer cleaning and oxidation. (3 classes)
3. Photolithography and chemical etching. (3 classes)
4. Solid State diffusion. (3 classes)
5. Process measurements. (3 classes)
6. Metallization. (1 class)
7. Electrical characterization. (1 class)

### Computer Usage:

The students are required to use computer programs to simulate the processing schedule for the devices to be fabricated in the lab especially the design values of bipolar transistor and to suggest changes in the schedule and/or predict the parameters of fabricated devices.

ABET category content as estimated by faculty member who prepared this course description:

Engineering Science: 1 credit or 33%.  
Engineering Design: 2 credits or 67%.

Prepared By: \_\_\_\_\_ Date: \_\_\_\_\_