

ELEG 5213 - INTEGRATED CIRCUIT FABRICATION TECHNOLOGY

Fall Semester, 1994

Catalog Data: 1995-96 ELEG 5213 Integrated Circuit Fabrication Technology. Credit 3. Theory and techniques of integrated and techniques of integrated circuit fabrication technology; crystal growth, chemical vapor deposition, impurity diffusion, oxidation, ion implantation, photolithography and metallization. Design and analysis of device fabrication using SUPREM and SEDAN. In process analysis techniques. Student papers and presentations on "state of the art" fabrication and device technology. Prerequisite: ELEG 4203 or consent.

Textbook: W. R. Runyan and K. E. Bean, Semiconductor Integrated Circuit Processing Technology, Addison Wesley, 1990.

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

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

Goals: This course is designed to give senior level students in electrical engineering a comprehensive background in integrated circuit fabrication theory and techniques. "State of the Art" fabrication and device technology is reviewed through student papers and presentations.

Prerequisite by Topic:

1. Conduction mechanisms in semiconductors.
2. Band theory in semiconductors.
3. PN junction theory.
4. Basic semiconductor device theory.

Topics:

1. Basic processing technology and related topics. (3 classes*)
2. Oxidation. (6 classes)
3. Film deposition and metallization. (4 classes)
4. Epitaxy. (4 classes)
5. Photolithography. (7 classes)
6. Etching. (5 classes)
7. Diffusion related processes. (9 classes)
8. Ion Implantation. (4 classes)
9. Exams. (3 classes)
10. "State of the Art" student presentations.

Term Projects:

Students present oral papers on state-of-the-art technology currently being employed in the microelectronics industry as well as on topics of interest not covered as lectures. These may include yield analysis, various characterization techniques etc. These presentations are made in a specially held Symposium on Microelectronic Processing. A copy of the proceedings is produced from their written papers. The entire symposium is videotaped for students to watch later.

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: _____