

Physical and Chemical Basis of Integrated Circuit Fabrication (MTSE 5520) (Syllabus)

- Instructor: Dr. Sundeep Mukherjee
- Time/Room: Tuesday/Thursday 10:00 AM – 11:20 AM (DP – D207A)
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Suggested Textbook: *Microchip Manufacturing* by Stanley Wolf

Course Description

MTSE 5520 will cover the topics of IC process flow, wafer fabrication, large scale integrated circuits, lithography, oxidation, ion implantation, wet & dry etching, multilevel metal interconnects, and process integration. Students will also give a term presentation and write a term paper. **The course will include hands-on clean-room demonstration!**

Course Schedule

Date	Tentative Topic
Jan 17-19	Introduction & History of ICs
Jan 24-26	Transistors (BJT/MOSFET)
Jan 31- Feb 02	Integrated Circuit Process Flow
Feb 07-09	Contamination Control
Feb 14-16	Silicon Single-Crystal Growth & Wafer Production
Feb 21-23-28	Diffusion and Ion Implantation
Mar 02-07	Oxidation
Mar 09	Mid-Term Exam (In class 10-11 am)
Mar 14-16	Spring Break (No class)
Mar 21-23	Cleanroom Demo
Mar 28-30	Lithography I
Apr 04-06	Lithography II/III (Next Gen)
Apr 11-13	Dry & Wet Etching
Apr 18-20	Term Presentations (In class 10-11 am)
Apr 25-27	Chemical-Mechanical Polishing
May 02-04	Multi-level Interconnects
May 11	Final Exam (In class 10-11 am)

Grading Policy:

100 > A > 90 > B > 80 > C > 70 > D > 60 > F

Points Distribution:

Mid-term Exam = 30%

Term Presentation = 30%

Final Exam = 30%

Homework/Cleanroom = 10%