

SYLLABUS

Introduction to IC Technology: Basic fabrication steps and their Importance. **Environment of IC Technology:** Concepts of Clean room and safety requirements, Concepts of Wafer cleaning processes and wet chemical etching techniques. **Impurity Incorporation:** Solid State diffusion modeling and technology; Ion Implantation modeling, technology and damage annealing, characterization of Impurity profiles **Oxidation:** Kinetics of Silicon dioxide growth both for thick, thin and ultra thin films, Oxidation technologies in VLSI and ULSI, Characterization of oxide films, High k and low k dielectrics for ULSI. **Lithography:** Photolithography, E-beam lithography and newer lithography techniques for VLSI/ULSI, Mask generation. **Chemical Vapour Deposition Techniques:** CVD techniques for deposition of polysilicon, silicon dioxide, silicon nitride and metal films; **Epitaxial growth of silicon:** modeling and technology. **Metal Film Deposition:** Evaporation and sputtering techniques, Failure mechanisms in metal interconnects Multi-level metallization schemes. **Plasma and Rapid Thermal Processing:** PECVD, Plasma etching and RIE techniques; RTP techniques for annealing, growth and deposition of various films for use in ULSI.

TEXT BOOKS

1. S.M.Sze(2nd Edition)"VLSI Technology", McGraw Hill Companies Inc.
2. C.Y. Chang and S.M.Sze (Ed), "ULSI Technology", McGraw Hill Companies Inc.

REFERENCES TEXT BOOKS

1. Stephena, Campbell, "The Science and Engineering of Microelectronic Fabrication", Second Edition, Oxford University Press.
2. James D. Plummer, Michael D. Deal, "Silicon VLSI Technology" Pearson Education