

## 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(2<sup>nd</sup> 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