

**SIR PADAMPAT SINGHANIA UNIVERSITY**  
**School of Engineering**

**COURSE PLAN**

Name of the Course Teacher : Shilpi Birla  
 Subject : Microelectronics Technology  
 Branch: E& CE Semester: VI Year: III  
 Course Code: EC 306 L-T-P-C: 3-0-0-3 *w.e.f. 29.12.2009*

Sr. No.	Topic	Contact Hours (Lectures)
1.	Introduction, Trends & Projections in IC Design & Technology	1
2.	Comparison between semiconductor materials, Basics of Thick and thin Film Hybrid Technology and monolithic chips, Advantages, limitations & Classification of ICs.	1
3.	Flow chart of Bipolar, NMOS and CMOS technologies	1
4.	Basics of VLSI Design & Process Simulation.	1
5	Starting material for formation of crystal, Horizontal Bridgeman Method	1
6	Czochralski growth, Distribution of dopants.	1
7	Zone refining, Silicon Float Zone process	1
8	Si-Wafer preparation, Epitaxial growth	1
9	Techniques used for Epitaxial growth	1
10	Thermal oxidation process (Kinetics of growth , Thin oxide growth)	1
11	Effect of impurities on the oxidation rate, Preoxidation Cleaning	1
12	Various oxidation techniques	1
13	Various oxidation techniques	1
14	Masking properties of SiO <sub>2</sub>	1
15	Photolithography and Etching	1
16	Pattern generation/Mask making,	1
17	Contact and Proximity printing	1
18	Photoresistant, Photolithography Process(Lift off technology) Fine line photolithography	1
19	Wet/Dry etching	1
20	Reactive Plasma etching techniques and applications	1
21	Basic diffusion process(Diffusion equation, Diffusion	1

	profiles),	
22	Diffusion, Extrinsic diffusion	1
23	Lateral Diffusion	
24	Ion Implantation Process	1
25	Ion distribution , Ion Stopping	
26	Implant Damage and Annealing process (Furnace and RTA)	1
27	IC Packaging	1
28	Isolation Techniques	1
29	Testing of the Chip	1
30	Wire Bonding techniques	1
31	Flip chip technique	1
32	Various Packaging methods and Materials	1
33	Fabrication of Diodes, Resistors,	1
34	Fabrication of capacitors and inductors	1
35	Fabrication of BJT	1
36	Fabrication of FET	1
37	Fabrication of MOS Devices	1
38	CMOS fabrication techniques (n-well and p-well process sequences)	1
39	Reliability issues in CMOS VLSI	1
40	Latching, Electro migration.	1
<b>Total Lectures-40</b>		

Head E&CE