

DEPARTMENT OF ELECTRONICS ENGINEERING

Lesson Plan for MOSIC Technology (ECE-308): B.Tech.(ECE) VIth Semester

Teacher Name: Prashant Kumar

Unit	Topic	No. of hours assigned	Book/ Reference
I	REVIEW OF MOS TECHNOLOGY	01	1
	Introduction to IC technology	01	1
	MOS Transistor enhancement mode and depletion mode operations	01	1
	Fabrication of NMOS, CMOS and BiCMOS devices	02	2
	Equivalent circuit for MOSFET and CMOS	01	1
II	MOS TRANSISTOR THEORY	01	1
	MOS device design equations, MOS transistor	02	1
	Evaluation aspects of MOS transistor, threshold voltage	01	1
	MOS transistor transconductance & output conductance, figure of merit	01	1
	determination of pull-up to pull- down ratio for an n-MOS inverter driven by another n-MOS inverter & by one or more pass transistor	02	1
	Alternative forms of pull-up, CMOS and BiCMOS-inverters	01	1
	Latch up in CMOS circuitry	01	1
III	MOS CIRCUITS AND LOGIC DESIGN	01	1
	Basic physical design of simple logic gates using n-MOS, p-MOS and CMOS	01	1
	CMOS logic gate design considerations	01	1
	CMOS logic structures, stick diagrams	02	1
IV	CIRCUIT CHARACTERIZATION AND PERFORMANCE ESTIMATION	01	1
	Resistance estimation, capacitance estimation, inductance	02	1
	CMOS gate transistor sizing, power dissipation	02	3
V	Introduction to VLSI FABRICATION	01	4
	Crystal growth, wafer preparation	02	4
	Epitaxy, oxidation	02	4
	lithography, etching, diffusion	02	4
	dielectric and poly- silicon film deposition	02	4
	ion implantation, yield and reliability, metallization	02	4
VI	DESIGN EXAMPLE USING CMOS	01	1
	Incrementer / decrementer, left/right shift serial/parallel register, comparator for two n-bit number.	03	1
	Total Lectures Required	40	

REFERENCE MATERIALS / BOOKS :

1. Basic VLSI Design: D. Pucknell
2. PPT from various sources
3. Microelectronics: Sedra & Smith
4. Basic VLSI: Botkar