



Course title	VLSI Technology									Course No	EE5312			
Department	Electrical Engineering	New Credits	L	T	E	P	O	C	T H	Old Credits	L	T	P	C
			4				8	12	12		4			
Offered for	All									Status	Modified			
Faculty	Nandita Das Gupta									Type	Theory			
Pre-requisite	EE3301									To take effect from				
Submission date	Date of approval by DCC			Date of approval by BAC						Date of approval by Senate				

Objectives:

This course is a course to introduce the students to the technology involved in IC processing. The course, mostly restricted to silicon ICs, is divided into two parts. First, the unique structure of silicon is introduced and production of silicon wafers is discussed. The unit processes required for IC manufacturing, viz oxidation, diffusion, lithography, etching, etc are each discussed in detail. These processes are then used in making MOSFETs and BJTs and ICs based on these devices. There is emphasis on improving the performance and reliability. Some recent trends in silicon ICs will also be covered.

Course Contents:

Introduction: Overview of VLSI, Crystal structure and Single Crystal growth of silicon. Epitaxy, Oxidation, Diffusion, Ion-implantation, Lithography, Dry and Wet Etching, Chemical Vapour Deposition of thin films, Metallization, MOSFET process flow with a view towards performance improvement, BJT Process flow with a view towards performance improvement, Current trends and challenges

Text Books:

VLSI Fabrication Principles by S.K.Ghandhi, Wiley 2008;
 VLSI Technology ed. S.M.SZE, McGrawHill 2003;
 Silicon VLSI Technology by J.D. Plummer, M.D.Deal and P.B.Griffin, Pearson 2009

Reference Books:

Microfabrication by Marc Madou, VLSI Technology, NPTEL course by Nandita DasGupta