

1.	Title of the course	VLSI Fabrication Technology
2.	Course number	EE572L
3.	Structure of credits (L-T-P-C)	3-0-0-3
4.	New course/modification to	Modified with EE547L/VLSI FABRICATION PRINCIPLES
5.	To be offered by	Electrical Engineering
6.	Proposed by	Gurugubelli Vijaya Kumar
7.	Prerequisite	CoT
8.	Course Objective(s): To discuss the basic principles and technology underlying the fabrication of semiconductor devices and integrated circuits. To illustrate the processing steps involved in realizing components and a VLSI chip.	
9.	Course Content: Introduction: historical developments, modern CMOS technology; Making of silicon wafer: crystal structure, defects, crystal growth, Czochralski and float-zone methods, wafer fabrication, basic properties of silicon wafers, clean rooms and wafer cleaning; Lithography: optical lithography, mask engineering, pattern generation and transfer, photoresists, advanced techniques like e-beam and x-ray lithography, etc.; Thermal oxidation; Dopant diffusion; Ion implantation; Thin film deposition: Physical Vapor Deposition (PVD), Chemical Vapor Deposition (CVD), Atomic Layer Deposition (ALD); Etching: wet etching, dry etching; Metallization; Device and circuit fabrication: CMOS and Bipolar Junction Transistor (BJT) fabrication steps, realization of on-chip resistor, diode, capacitor and inductor; Bonding and packaging.	
10.	Textbook(s): 1. Plummer J D, Deal M D and Griffin P B, Silicon VLSI Technology: Fundamentals, Practice and Modeling, Pearson India (2009). 2. Gandhi S K, VLSI Fabrication Principles: Silicon and Gallium Arsenide, 2nd Edition, Wiley (2008).	
11.	Reference(s): 1. Sze S M, VLSI Technology, 2nd Edition, McGraw Hill Education (2017). 2. Plummer J D and Griffin P B, Integration Circuit Fabrication: Science and Technology, Cambridge University Press (2023).	