

1.	Title of the course	Digital VLSI Design
2.	Course number	EE535L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To EE5109/16
6.	To be offered by	Department of Electrical Engineering
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	Course Objective(s): To introduce the concepts of the digital integrated circuits design and the transistor based circuits design.	
10.	Course Content: CMOS inverter construction, transfer characteristics; Resistance and capacitance, transient response; Dynamic, short circuit and leakage power analysis; Combinational circuit design and capacitance; Parasitic delay, logical effort and electrical effort; Gate sizing, buffering; Asymmetric gate, skewed gates, ratioed logic; Dynamic gates, domino logic and static timing analysis; Sequential circuits and feedback; Various D flip flop circuits - static and dynamic; Setup and hold time measurement, timing analysis of latch/flipflop based systems; Adders - mirror adder, carry skip adder, carry select adder, square root adder; Multipliers - signed and unsigned arithmetic, carry save multiplier implementation; DRAM, SRAM and CAM memory designs.	
11.	Textbook(s): 1. Baker R J, <i>CMOS: Circuit Design, Layout, and Simulation</i> , 4th Edition, John Wiley and Sons (2019). 2. Rabaey J M, Chandrakasan A and Nikolic B, <i>Digital Integrated Circuits: A design perspective</i> , 2nd Edition, Pearson Education India (2016).	
12.	Reference(s): 1. Harris D M and Weste N, <i>CMOS VLSI Design: A Circuits and Systems Perspective</i> , 4th Edition, Pearson Education India (2015). 2. Kang S M, Leblebici Y and Chulwoo K, <i>CMOS Digital Integrated Circuits, Analysis and Design</i> , 4th Edition, McGraw Hill Education (2019). 3. Uyemura J P, <i>CMOS Logic Circuit Design</i> , 2nd Edition, Springer Books (2005).	