1.	Title of the course	MOS Device Modelling and Characterization
2.	Course number	EE540L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To EE5023/16
6.	To be offered by	Department of Electrical Engineering
7.	To take effect from	July 2022
8.	Prerequisite	CoT
9.	**Course Objective(s):** To provide an understanding of operation, modeling and characterization of MOS devices that are inherent to all VLSI circuits.	
10.	**Course Content:** MOS capacitor: C-V characteristics, effect of metal work function, oxide and interface trapped charges, threshold voltage, tunnelling current; MOSFET: threshold based models of static I-V characteristics, channel length modulation, field-dependent mobility, short channel and narrow width effects, subthreshold current, quantum mechanical effects, capacitances, concept of non-reciprocal capacitances, dynamic behaviour under small and large signals, surface potential and charge based models, model parameters and their extraction; SOI MOSFETs; Double gate MOSFETs and FinFETs.	
11.	**Textbook(s):** 1. Schroder D K, *Semiconductor Material and Device Characterisation*, 3rd Edition, John Wiley & Sons (2006). 2. Taur Y and Ning T H, *Fundamentals of Modern VLSI devices*, 2nd Edition, Cambridge (2013).	
12.	**Reference(s):** 1. Arora N, *MOSFET modeling for VLSI Simulation: Theory and Practice*, 1st Edition, World Scientific (2007).	