

1.	Title of the course	High Speed Devices and Circuits
2.	Course number	EE501L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To EE5107/2
6.	To be offered by	Department of Electrical Engineering
7.	To take effect from	July 2022
8.	Prerequisite	Solid State Devices
9.	Course Objective(s): The objective of the course is to introduce the compound semiconductor technology that enables the superior performance of some of the semiconductor devices. The course also aims at introducing the associated high-frequency/speed devices.	
10.	Course Content: Introduction: Materials for high speed devices and circuits, silicon-germanium alloys and silicon carbide for high speed devices, Material and device process techniques; Metal-semiconductor contacts: Native oxides of compound semiconductors for MOS devices and the interface state density related issues, Metal semiconductor contacts; Metal semiconductor Field Effect Transistors (MESFETs); High Electron Mobility Transistors (HEMTs); Hetero junction Bipolar transistors (HBTs); High speed Circuits: GaAs Digital Integrated Circuits for high speed operation- Direct Coupled Field Effect Transistor Logic (DCFL), Schottky Diode FET Logic (SDFL), Buffered FET Logic(BFL); GaAs FET Amplifiers; Monolithic Microwave Integrated Circuits (MMICs);	
11.	Textbook(s): 1. Gandhi S K, VLSI Fabrication Principles: Silicon and Gallium Arsenide, Wiley, NY (1994). 2. Chang C Y and Kat F, <i>GaAs High Speed Devices: Physics, Technology, and Circuit applications</i> , Wiley, NY (1994).	
12.	Reference(s): 1. Sze S M, <i>Semiconductor Devices: Physics & Technology</i> , John Wiley & Sons (2008). 2. Shur M, <i>GaAs Devices and Circuits</i> , Plenum Press, NY (1987). 3. Achutan M K and Bhat K N, <i>Fundamentals of Semiconductor Devices</i> , Tata McGraw-Hill, New Delhi (2007).	