

1.	Title of the course	Microwave Integrated Circuits
2.	Course number	EE549L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To EE5055/17
6.	To be offered by	Department of Electrical Engineering
7.	To take effect from	July 2022
8.	Prerequisite	CoT
9.	Course Objective(s): To introduce the foundations of microwave integrated circuits and their fundamental circuit blocks for the modern transceiver architecture and communication systems.	
10.	Course Content: Fundamentals of transmission lines, foundations of microstrip lines, striplines, slotlines, coplanar waveguides, coplanar strips; Launching techniques and transitions; Lumped components: capacitors, inductors and resistors; Discontinuities, open-circuit end correction, corners, symmetrical steps, T-junctions, series gaps, and bends; Periodic structures, filter design by the image parameter and insertion loss method, filter transformations and implementation, design of various types of low-pass, high-pass, band-stop and band-pass filters; Even- and odd-mode analysis; Branch-line couplers; hybrid-ring couplers, coupled lines and directional couplers; Noise characterization and design options; Switches, phase shifters, detectors and mixers; Amplifiers and oscillators.	
11.	Textbook(s): 1. Edwards T C and Steer M B, <i>Foundations for Interconnects and Microstrip Design</i> , 4th Edition, John Wiley & Sons (2016). 2. Fooks E H and Zakarevicius R A, <i>Microwave Engineering Using Microstrip Circuits</i> , 1st Edition, Prentice- Hall (1990).	
12.	Reference(s): 1. Ludwig R and Bretchko P, <i>RF Circuit Design</i> , 1st Edition, Pearson Education (2000). 2. Misra D K, <i>Radio-frequency and Microwave Communication Circuits</i> , 1st Edition, John Wiley & Sons (2001).	