Course Type	Course Code	Name of Course	L	T	P	Credit
DE	NECD526	MIC and MMIC	3	0	0	3

Course Objective
MIC and MMIC technology provide the core component for wide range of microwave and millimeter wave communication, radar and sensing systems. The course aims to present different features of microwave circuits in integrated form. So, students will learn different aspects of integrated circuits in microwave frequency.
Learning Outcomes
Upon successful completion of this course, students will: • Acquire knowledge about Microwave Integrated Circuits. • Gain knowledge and understanding of lumped elements for MIC. • Develop understanding of the fundamentals required to design & implement Integrated Circuits operating at microwave frequencies. • 4. Acquire a knowledge about Microwave Semiconductor Devices.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Conductor and dielectric losses in planar transmission lines, coupled lines, multi-conductor lines, discontinuities, Basic Passive Components - Lumped elements in MIC & MMIC. Realization in microstrip and suspended stripline Basics of MIC, MMIC.	10	This unit will help students to get information about passive components used in MMIC.
2	MEMS technologies. Realization of planar transmission lines and filters in MEMS.	9	This unit will help students in understanding the MEMS.
3	Active device technologies and design approaches, Fabrication and modeling: Bipolar junction transistor, Hetero-junction bipolar transistor, High electron mobility transistor, MESFET, CMOS, BiCMOS.	11	This unit will help students to get information about active components used in MMIC.
4	Packaging, Interconnects, Monolithic Integrated Antenna, Phase Shifters-PIN diode- Equivalent circuit and Characteristics, Basic series and shunt switches in microstrip. Overview of Transceiver Design.	12	This will help in designing & implementing Integrated Circuits operating at microwave frequencies.
	Total	**42**	

Text Book:

1.RFIC and MMIC design and technology by I. D. Robertson and S. Lucyszyn, The Institute of Electrical Engineers, Second Edition 2001.

Reference Book:

1.Advanced Millimeter-wave Technologies: Antennas, Packaging and Circuits by Duixian Liu, Ulrich Pfeiffer, Janusz Grzyb, Brian Gaucher. Wiley, First Edition 2009.