

MICROWAVE INTEGRATED CIRCUITS

17ECMC1T6C

Credits: 4

Lecture: 4 periods/week

Internal assessment: 40 marks

Semester end examination: 60 marks

Prerequisites: Computer Networks.

Course Objectives:

- To understand the basic concepts of microstrip lines
- To gain knowledge on various microstrip passive components.
- To be familiar with design concepts of microwave amplifier.
- To provide an insight on the design of microwave oscillators.

Course Outcomes:

- Student will be able to
- Analyze various characteristics of microstrip lines.
 - Learn the circuit models of various microstrip passive components.
 - Design microwave amplifiers for the required specifications.
 - Study and analyzing microwave oscillators.

UNIT-I

Introduction of Strip Lines: Review of development and application of the modern transmission line structure as interconnect and as a medium for realization of components for the MIC and MMIC: quasi – static and frequency dependent medium closed form models of microstrip line for effective relative permittivity, capacitance ,characteristic impedance analysis and dielectric and conductor losses: Effect of conductor thickness, top shield and side walls on the propagation characteristics of a microstrip line.

UNIT-II

Microstrip Passive Components: Circuit models of discontinuities in microstrip lines and the coplanar waveguide, open ended, short ,gaps, step, bent, T- junction, Hybrid line coupler, parallel coupled line and directional couplers, filters.

UNIT-III

Microwave Amplifier Design: Microwave transistors, Stability considerations, Power-gain definitions, Simultaneous conjugate matching, Consideration for unilateral design.

UNIT-IV

Microwave Oscillator Design: Negative Resistance Oscillators, Transistor Oscillators .

Text Book:

1. Bharathi Bhat &Shiban K.Koul,"Stripline – like Transmission Lines for Microwave Integrated Circuits," John Wiley.

References:

1. E.H Fooks& R.A. Zakarevicuis," Microwave Engineering using Microstrip Circuits." Prentice Hall. T.C.Edwards ,"Foundation for Microstrip Circuit Design ," Jone Willy & sons.
2. M.Samuel,Y.Lieo," Microwave Circuit Analysis and AmpliferDseign ," Prentic Hall .