Course Type	Course Code	Name of Course	L	T	P	Credit
DC	NECC5**10**	Microwave Transmission Lines and Matching Networks	3	1	0	4

Course Objective

The course aims to introduce the students to different kinds of available high frequency / microwave transmission lines and matching networks. The student will basically learn how to select, analyze, and design a transmission line and a matching network for a given network.

Learning Outcomes

Upon successful completion of this course, students will be familiar with different kind of

- single conductor and multi conductor transmission lines, like, two-wire transmission lines, waveguides, planar transmission lines etc and their analysis.
- Matching networks, like, lumped element matching network, distributed element matching network, and tapered line matching networks.

Module No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Introduction to two-wire transmission lines, Per unit length parameters of two wire transmission lines, General analysis of TE and TM modes, Introduction to Parallel plate waveguide, rectangular waveguide and circular waveguide, Field theoretic analysis of coaxial line and parallel plate transmission line, Transmission line analogy of waveguide.	12	Students will be introduced to two-wire transmission lines and waveguides and their analysis procedure.
2	TE and TM mode Surface wave propagation in grounded dielectric slab, Microstrip lines, Strip lines, Coupled microstrip lines, Introduction to other planar transmission lines such as co-planar waveguide.	12	This unit will introduce the student with different kind of planar transmission lines, their analysis, and surface wave propagation in planar transmission lines.
3	Smith chart, Lumped element matching networks (L, Pi and T-network), Single stub and double stub matching network, Application of Smith chart in designing different matching networks, Quarter wave matching network, Theory of small reflections, Multi-section transformers, Tapered line matching network (Exponential, triangular and Chebyshev), Synthesis of tapered line matching networks, Bode-Fano criteria.	18	Students will familiarize with different kind of transmission line matching networks, their analysis, and design proceduere.
	Total	**42**	

Text Book:

1.Microwave Engineering, S. Das. First edition, 2014.

Reference Books:

1.Microwave Engineering, D. M. Pozar, 4th edition, 2012.
2. Transmission Line Design Handbook (Artech House Antennas and Propagation Library) by Brian C. Wadell, 1991.
3. Transmission Lines and Lumped Circuits: Fundamentals and Applications (Electromagnetism) by G. Miano and A. Maffucci, 1st edition, 2001.
4. Foundation of Microwave Engineering, R. E. Collin, 2nd edition, 2007.