Course Type	Course Code	Name of Course	L	T	P	Credit
DC	ECC202	Signals & Networks	3	1	0	11

Course Objective
The objective of the course is to develop an understanding of the basic signals and network concepts. Signal concepts will be needed in a broad range of areas including Communication Theory, Signal Processing and Image Processing. Network concepts will be needed in case Analog Circuit Design.
Learning Outcomes
Upon successful completion of this course, students will: • acquire a basic knowledge of the properties of signals. • develop the understanding of the analysis of circuits

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Definitions and concepts of different types of signals and systems, Convolution, Differential and Difference equation	7+3T	Develop an understanding of the concept of various signals and systems
	LTI systems, Fourier Series, Fourier Transforms, Laplace Transform.	10+3T	Acquire an understanding of methods of the analysis of signals & systems
2	Time domain analysis of RL, RC, and RLC circuits, Transient solutions of networks using Laplace Transform;	6+1T	Develop an understanding about the time domain analysis of passive networks
3	Network functions: poles, zeros, transfer function, two port network parameters and functions : Z, Y and ABCD parameters, driving point and transfer impedances and admittances;	7+3T	Develop the concepts of analyzing the circuits using two port network parameters
4	Network Theorems and Formulation of Network equations: generalized formulation of KCL, KVL, Thevenin, Norton, Maximum Power Transfer, Tellegen and Reciprocity Theorems;	7+3T	Understand the applications of different network theorem to analyze circuits.
5	Graph theory: Tree, Co-tree, fundamental cut-set, fundamental loop analysis of network	5+1T	Understand the fundamentals and applications of graph theory
	Total	**56**	

Textbook:

1. Signals and Systems by Alan V. Oppenheim, Alan S. Willsky with S. Hamid Nawab, Pearson Education India; 2 edition (2015)
2. Network Analysis by M. E. Van Valkenburg, Prentice-Hall of India Pvt Ltd., New Delhi,Third Edition.

Reference Books:

1. Principles of Signal Processing and Linear Systems by B.P. Lathi,Oxford University Press; First edition (July 2009).
2. Schaum's Outline of Graph Theory: Including Hundreds of Solved Problems (Schaum's Outlines) by V. Balakrishnan, McGraw-Hill Education; First edition