PROF. TAPAS KUMAR BHATTACHARYA
Department of Electrical and Electronics Engineering
IIT Kharagpur

TYPE OF COURSE : New | Core | UG
COURSE DURATION : 12 weeks (27 Jan’ 20 - 17 Apr’ 20)
EXAM DATE : 26 Apr 2020

PRE-REQUISITES : Basic Electrical Technology
INTENDED AUDIENCE : Electrical, Electronics & Communication & Instrumentation
INDUSTRIES APPLICABLE TO : Power utility services : CESC, State electricity boards, NTPC etc.

COURSE OUTLINE :
The course begins with description of circuit elements & sources. Understanding of various interesting network theorems applied to solve linear, time invariant network problems efficiently in time and s-domain is discussed. Steady and transient solution of network problems with various sources including impulse source, Representing a circuit in s-domain (Laplace domain). Two-port networks. Graph, tree of networks and use them to solve large network problems using matrices are also covered.

ABOUT INSTRUCTOR :
Tapas Kumar Bhattacharya has over thirty years of teaching experience at IIT Kharagpur. He has taught signals and system core course at IIT Kharagpur several times. His area of research interest is in the field of electrical machines and special electrical machines and circuits.

COURSE PLAN :
Week 1: Introduction to Network, circuit elements & sources. KVL & KCL
Week 2: Solution of linear differential equation with different excitation.
Week 3: Deeper look into energy storing elements : inductor and capacitor.
Week 4: Ideal and practical voltage & current sources.
Week 5: Mesh and nodal analysis of networks.
Week 6: Transforming voltage to current source and vice-versa. Thevenin / Norton’s equivalent circuit.
Week 8: Two-port network: Z-parameters, Y-parameters, h-parameters & ABCD parameters.
Week 10: [A],[B] & [Q] matrices : Relationship among them
Week 11: Tutorial -1
Week 12: Tutorial-2