

SRM UNIVERSITY
FACULTY OF ENGINEERING AND TECHNOLOGY
SCHOOL OF ELECTRONICS AND ELECTRICAL ENGINEERING

DEPARTMENT OF TCE
COURSE PLAN

Course Code : TE1006
Course Title : Transmission lines and Networks
Class : II Year -ITCE
Semester : IV Semester (Jan- April 2016)
Location : S.R.M.E.C – Tech Park

Faculty Details

SL. NO	NAME	OFFICE	OFFICE HOURS	E-MAIL ID
1.	Mr. S. Vijay ananth	TP13S4	8:30 to 5:00	vijayananth.s@ktr.srmuniv.ac.in

Required Text Books:

1. John D.Ryder , "Networks,lines and fields",PH1,1991
2. Umesh Sinha,"Transmission Lines and Networks",Satya Prakashan Publishing Company,New Delhi,2001

Prerequisite

Circuits and Networks.

Objectives

1. To lay a strong foundation on the theory of transmission line and networks by highlighting their applications

Assessment details

Cycle Test – I : 10 Marks
 Cycle test- II : 10 Marks
 Surprise test : 5Marks
 Model Exam : 20 Marks
 Attendance : 5 Marks

Test Schedule

SL.NO	DATE	TEST	TOPICS	DURATION
1		Cycle test- I	1 to 18	2 HRS
2		Cycle test- II	19 to 36	2 HRS
3		Model Exam	1 to 45	3 HRS

Outcomes

Students who have successfully completed this course will have able to do the following

Course outcome	Program outcome
Propagation of signals through lines Calculation of parameters of transmission lines Need for impedance matching Design of filters and equalizers and attenuator	<ul style="list-style-type: none"> • Students have complete exposure to basics and Fundamentals of transmission lines. • Learn about key filters ,equalizers and attenuators

DETAILED SESSION PLAN

General theory of Transmission lines – the transmission line – general solution – The infinite line – Wavelength, velocity of propagation – Waveform distortion – the distortionless line – Loading and different methods of loading – Line not terminated in Z_0 – Reflection coefficient – calculation of current , voltage, power delivered and efficiency of transmission – Input and transfer impedance – Open and short circuited lines – reflection factor and reflection loss.				
Session No	Topics to be covered	Refer ence	Teaching Method	Testing Method
1	General theory of Transmission lines	1,2	BB	1.Group discussion 2.Self-test questions
2	the transmission line – general solution	1,2	BB	1.Assignment
3	The infinite line – Wavelength, velocity of propagation	1,2	BB	1.Self-test questions 2.Group discussion
4	Waveform distortion – the distortionless line	1,2	BB	1.Group discussion
5	Loading and different methods of loading	1,2	BB	1.Self test questions
6	Line not terminated in Z_0 – Reflection coefficient	1,2	BB	1.Group discussion
7	calculation of current , voltage, power delivered and efficiency of transmission	1,2	BB	1.Self test questions
8	Input and transfer impedance – Open and short circuited lines	1,2	BB	1.Quiz 2.Self test questions
9	reflection factor and reflection loss	1,2	BB	1.Self test questions
Transmission line equations at radio frequencies – Line of Zero dissipation – Voltage and current on the dissipationless line, Standing Waves, Nodes , Standing Wave Ratio – Input impedance of the dissipationless line – Open and short circuited lines – Power and impedance measurement on lines – Reflection losses – Measurement of VSWR and wavelength				
10	Transmission line equations at radio frequencies	1,2	BB	1.Self test questions
11	Line of Zero dissipation Voltage and current on the dissipationless line,	1,2	BB	1..Self test questions
12	Standing Waves, Nodes , Standing Wave Ratio	1,2	BB	1.Quiz 2.Self test questions
13	Input impedance of the dissipationless line	1,2	BB	1.Quiz 2.Self test questions
14	Open and short circuited lines	1,2	BB	1.Self test questions
15	Power and impedance measurement on lines	1,2	BB	1.Quiz 2.Self test questions
16	Reflection losses –	1,2	BB	1.Quiz 2.Self test questions
17	Measurement of VSWR and wavelength	1,2	BB	1.Quiz 2.Self test questions
18	problems	1,2	BB	Group discussion
Impedance matching: Quarter wave transformer - Impedance matching by stubs - Single stub and double stub matching - Smith chart - Solutions of problems using Smith chart - Single and double stub matching using Smith chart				
19	Impedance matching:	1,2	BB	1.Quiz 2.Self test questions

20	Quarter wave transformer	1,2	BB	1.Group discussion 2.Self test questions
21	Impedance matching by stubs	1,2	BB	1.Quiz 2.Self test questions
22	Single stub matching	1,2	BB	1.Quiz 2.Self test questions
23	double stub matching	1,2	BB	1.Quiz 2.Self test questions
24	Smith chart	1,2	BB	1.Quiz 2.Self test questions
25	Solutions of problems using Smith chart	1,2	BB	1.Quiz 2.Self test questions
26	single stub matching using Smith chart	1,2	BB	1.Quiz 2.Self test questions
27	double stub matching using Smith chart	1,2	BB	1.Quiz 2.Self test questions
Characteristic impedance of symmetrical networks - filter fundamentals, Design of filters: Constant K, Low Pass, High Pass, Band Pass, Band Elimination, m-derived sections and composite				
28	Characteristic impedance of symmetrical networks	1,2	BB	1.Quiz 2.Self test questions
29	filter fundamentals	1,2	BB	1.Quiz 2.Self test questions
30	Design of filters: Constant K	1,2	BB	1.Quiz 2.Self test questions
31	Low Pass filters	1,2	BB	Group discussion
32	High Pass filters	1,2	BB	Group discussion
33	Band Pass filters	1,2	BB	Group discussion
34	Band Elimination filters	1,2	BB	Group discussion
35	m-derived sections and composite	1,2	BB	Group discussion
36	problems	1,2	BB	Group discussion
Attenuators: T, Π, Lattice Attenuators, Bridged - T attenuator, L-Type Attenuator, Equalizers: inverse network, series, full series, shunt, full shunt, constant resistance T, constant resistance, constant resistance lattice and bridged T network				
37	Attenuators: T, Π , Lattice Attenuators,	1,2	BB	1.Quiz 2.Self test questions
38	Bridged T attenuator	1,2	BB	Seminar
39	L-Type Attenuator	1,2	BB	1.Quiz 2.Self test questions
40	Equalizers: inverse network, series, full series,	1,2	BB	1.Quiz 2.Self test questions
41	Equalizers:shunt, full shunt	1,2	BB	1.Quiz 2.Self test questions
42	constant resistance T	1,2	BB	1.Quiz 2.Self test questions
43	constant resistance	1,2	BB	1.Quiz 2.Self test questions
44	Constant resistance lattice	1,2	BB	1.Quiz 2.Self test questions
45	bridged T network	1,2	BB	1.Quiz 2.Self test questions