

Lesson Plan

Name of the Faculty : Er. Bhavya Garg

Discipline : Electronics and Communication Engineering

Semester : 6th

Subject : Control System Engineering (EC-302 A)

Lesson Plan Duration : 15 weeks (from Jan, 2026 to May, 2026)

****Work Load (Lecture / Practical) per week (in hours)** : Lectures-03, Practical-03

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical day	Topic
1 st	1 st	The control system-open loop & closed loop	1 st	Using MATLAB obtain time response of a second order system in case of under damped, over damped and critically damped system.
	2 nd	Servomechanism		
	3 rd	Stepper motor.		
2 nd	4 th	Differential equation of physical systems	2 nd	To design a passive RC lead compensating network for the given specifications and to obtain its frequency response
	5 th	Transfer function		
	6 th	Block diagram algebra,		
3 rd	7 th	Signal flow-graphs	3 rd	To design a passive RC lag compensating network for the given specifications and to obtain its frequency response.
	8 th	Mason's formula & its application		
	9 th	Feedback and non-feedback systems		
4 th	10 th	Effects of feedback on sensitivity (to parameter variations),	4 th	Viva-Voce- 1
	11 th	Effects of feedback on stability		
	12 th	Effects of feedback on overall gain		
5 th	13 th	Standard test signals	5 th	To obtain torque speed characteristics of AC servo motor.
	14 th	Class Test 1		
	15 th	Time response of first order and second order systems		
6 th	16 th	steady-state errors and error constants	6 th	To obtain torque speed characteristics of DC servo motor.
	17 th	Design specification of second-order systems.		
	18 th	The concept of stability		
7 th	19 th	Necessary conditions for stability	7 th	Viva-Voce-2
	20 th	Hurwitz stability criterion,		

	21 st	Assignment 1		
8 th	22 nd	Routh stability criterion	8 th	To determine frequency response of a second order system and evaluation of Frequency domain specifications
	23 rd	Relative stability analysis.		
	24 th	The Root locus concept,		
9 th	25 th	Construction /development of root loci for various systems	9 th	To simulate a DC position control system and hence to find the step response using MATLAB.
	26 th	Stability considerations.		
	27 th	Standard test signals		
10 th	28 th	Correlation between time and frequency response,	10 th	Obtain the phase margin and gain margin for a given transfer function by drawing bode plots and verify the same using MATLAB.
	29 th	Polar Plots		
	30 th	Class Test 2		
11 th	31 st	Nyquist plots,	11 th	Viva-Voce-3
	32 nd	Bode Plots,		
	33 rd	Nyquist stability criterion, Gain margin & Phase margin		
12 th	34 th	Relative stability using Nyquist Criterion	12 th	To obtain Root locus of a given T. F. and hence finding breakaway point, intersection point on imaginary axis and to draw the Nyquist plot for the given transfer function using MATLAB.
	35 th	Frequency response specifications.		
	36 th	Assignment 2		
13 th	37 th	Necessity of Compensation	13 th	To digitally simulate the time response characteristics of Linear SISO systems using state variable formulation.
	38 th	Phase lag compensation, phase lead compensation		
	39 th	Phase lag lead compensation		
14 th	40 th	Feedback compensation.	14 th	Experiment to draw the frequency response of a given lead-lag compensating network
	41 st	Concept of state, state variable and state model		
	42 nd	State models for linear continuous time systems,		
15 th	43 rd	Diagonalization solution of state equations	15 th	Internal Viva – Voce
	44 th	Concept of controllability and observability .		
	45 th	Assignment 3		

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