lesson Plan

Name of the Faculty Varunendra Kumar Singh
Discipline:Instrumentation & Control
Semester:3rd
Subject: Control System Engineering
Lesson Plan Duration : 15 weeks(from Aug to Dec 2024)
Work Load (lecture/practical)per week (in hours) : Lectures- 03, practical- 04

c		Theory		Practicals
	Lecture Day	Topic (inculding assignment/test)	Practical hour	Topic
1st	1st	Basic elements of control system.	1	To study/design open loop control system
	2nd	Open loop control system	2	
	3rd	Closed loop control system.	3	
			4	
2nd	4th	Manually controlled closed loop systems.	5	To study/design closed loop control system
	5th	Automatic controlled closed loop systems	6	
	6th	Basic elements of a servo mechanism	7	
3rd	7th	Linear systems, non-linear systems	9	To demonstrate the synchro characteristic and use a synchro pair as error detector
	8th	Mathematical modelling of physical systems: a) Mechanical system: Rotational and Translational systems	10	
	9th	Mathematical modelling of physical systems: b)Electrical syste	11	
4th	10th	Introduction to Laplace transform.	13	File checking
	11th	Revision	14	
	12th	Transfer function.	16	
5th	13th	Block diagram of closed loop system	17	To illustrate the effect the damping factor on the frequency response of second order
	14th	Block diagram reduction techniques, Problems on block diagra	18	
	15th	Signal flow graph, Mason's formula.	19	
			20	
6th	16th	Standard test signals	21	To find the stability of polynomial using Routh array criterion using
	17th	Time response of first order system subjected to step and imp	22	
	18th		23	

		Introduction to second order system (Over damped).	24	using Scilab/Matlab
7th	19th	Introduction to second order system (critically damped).	25	To plot the root locus of a given system using Scilab/Matlab
	20th	Introduction to second order system (under damped systems)	26	
	21st	Time domain specifications (Delay time)	27 28	
8th	22nd	Time domain specifications (rise time)	29	To draw a bode plot problems using Scilab/Matlab
	23rd	Time domain specifications (peak time)	30	
	24th	Time domain specifications (peak overshoot)	31 32	
9th	25th	Time domain specifications (settling time)	33	To find gain margin and phase margin with crossover frequency of a system using
	26th	Time domain specifications (steady state error)	34	
	27th	Copy Checking	35 36	
10th	28th	Routh Array Criterion	37	To study Non linearity behaviour of relay
	29th	Problems of Routh Array	38	
	30th	Revision	39	
11th	31st	Introduction to Bode Plot	41	Feedback from students
	32nd	Introduction to behaviour of non-linear control system	42	
	33rd	Principle of superposition and homogeneity	43 44	
12th	34th	Different types of non-linearites : Saturation	45	File checking
	35th	Different types of non-linearites : Backlash	46	
	36th	Class Test	47 48	
13th	37th	Different types of non-linearites : Hystersis	49	Viva voice
	38th	Different types of non-linearites : Dead Zone	50	
	39th	Different types of non-linearites : Relay	51 52	
14th	40th	Different types of non-linearites : Friction	53	Viva voice
	41st	Different types of non-linearites : Limit Cycle	54	
	42nd	Different types of non-linearites : Jump Resonance	55 56	
15th	43rd	Different types of non-linearites : Jump phenomenon	57	Viva voice
	44th	Difference between linear and non-linear control system	58	
	45th	Revision	59	