Lesson Plan of Control System Engineering

Discipline:- Electrical	Semester:- 6th	Name Of The Teaching Faculty:- TUKURAJ SOREN	
Subject:- Control System	No Of Days Per week Class Allotted:-5	No Of Weeks:-15 04/02/2025 to 17/05/2025	
No. of week	**No. of class**	**Topic to be taught**	
1st	1	Classification of Control system	
	2	Open loop system & Closed loop system and its comparison	
	3	Continue	
	4	Effects of Feed back	
	5	Standard test Signals(Step, Ramp, Parabolic, Impulse Functions)	
2nd	6	Servomechanism	
	7	Continue	
	8	Transfer Function & Impulse response,	
	9	Properties, Advantages & Disadvantages of Transfer Function	
	10	Poles & Zeroes of transfer Function	
3rd	11	Simple problems of transfer function of network.	
	12	Mathematical modeling of Electrical Systems(R, L, C, Analogous systems)	
	13	Components of Control System	
	14	Continue	
	15	Gyroscope, Synchros, Tachometer, DC servomotors, Ac Servomotors.	
4th	16	Continue	
	17	Continue	
	18	Definition: Basic Elements of Block Diagram	
	19	Canonical Form of Closed loop Systems	
	20	Rules for Block diagram reduction	
5th	21	Procedure for of Reduction of Block Diagram	
	22	Simple Problem for equivalent transfer function	
	23	Basic Definition in Signal Flow Graph & properties	
	24	Construction of Signal Flow graph from Block diagram	
	25	Mason's Gain formula	
6th	26	Simple problems in Signal flow graph for network	
	27	Continue	
	28	Time response of control system.	
	29	Standard Test signal- Step signal, Ramp Signal	
	30	Parabolic Signal	

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7th	31	Impulse Signal
	32	Impulse Signal
	33	Unit step response ,.
	34	Unit impulse response
	35	Time response of second order system to the unit step input.
8th	36	Time response specification.
	37	Derivation of expression for rise time, peak time, peak overshoot, settling time and steady state error, Steady state error and error constants.
	38	Types of control system.[Steady state errors in Type-0, Type-1, Type-2 system]
	39	Effect of adding poles and zero to transfer function, Response with P, PI, PD and PID controller.
	40	Root locus concept.
9th	41	Continue
	42	Continue
	43	Construction of root loci.
	44	Continue
	45	Continue
10th	46	Rules for construction of the root locus.
	47	Continue
	48	Continue .
	49	Effect of adding poles and zeros to G(s) and H(s).
	50	Continue
11th	51	Continue
	52	Correlation between time response and frequency response.
	53	Polar plots.
	54	Bode plots.
	55	Continue
12th	56	Foundation
	57	All pass and minimum phase system.
	58	Continue
	59	Computation of Gain margin and phase margin.
	60	Continue
13th	61	Log magnitude versus phase plot.
	62	Continue
	63	Closed loop frequency response.
	64	Principle of argument.
	65	Nyquist stability criterion.
14th	66	Niquist stability criterion applied to inverse polar plot.
	67	Continue
	68	Effect of addition of poles and zeros to G(S) H(S) on the shape of Niquist plot.
	69	Continue

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15th		70	Assessment of relative stability.
		71	Continue
		72	Constant M and N circle
		73	Continue
		74	Nicholas chart.
		75	Continue

Tukuraj Soren.
Teaching Faculty

HOD,EE 24/02/2025