

Lesson Plan			
	Discipline:Electrical Engineering	Semester-6th Summer 2024	Name of the Teaching Faculty: Sri Debasis Kar
Sl. No.	Subject:-Control System Engineering	No. Of Days/Week class allotted:05	Semester From date: 16/01/2024 To date: 26/04/2024. No of weeks: 15
	Weeks/Months	Class Day	Topic
1	1st Week	1st(16.01.2024)	1.1. Classification of Control system
		2nd(17.01.2024)	1.2. Open loop system & Closed loop system and its comparison
2	2nd Week	1st(22.01.2024)	1.3. Effects of Feed back 1.4. Standard test Signals(Step, Ramp, Parabolic, Impulse Functions)
		2nd(22.01.2024)	1.5. Servomechanism
		3rd(24.01.2024)	2.1. Transfer Function & Impulse response,
		4th(27.01.2024)	2.2. Properties, Advantages & Disadvantages of Transfer Function.
3	3rd Week	1st(29.01.2024)	2.3. Poles & Zeroes of transfer Function
		2nd(29.01.2024)	2.4. Simple problems of transfer function of network. 2.5. Mathematical modeling of Electrical Systems
		3rd(30.01.2024)	3.1. Components of Control System
		4th(31.01.2024)	3.1. Components of Control System
		5th(03.02.2024)	3.2. Gyroscope, Synchros, Tachometer, DC servomotors, Ac Servomotors
4	4th Week	1st(05.02.2024)	3.2. Gyroscope, Synchros, Tachometer, DC servomotors, Ac Servomotors
		2nd(05.02.2024)	4.1. Definition: Basic Elements of Block Diagram 4.2. Canonical Form of Closed loop Systems
		3rd(06.02.2024)	4.3. Rules for Block diagram reduction
		4th(07.02.2024)	4.4. Procedure for of Reduction of Block Diagram
		5th(10.02.2024)	4.5. Simple Problem for equivalent transfer function
5	5th Week	1st(12.02.2024)	4.6. Basic Definition in Signal Flow Graph & properties
		2nd(12.02.2024)	4.7. Construction of Signal Flow graph from Block diagram
		3rd(13.02.2024)	4.8. Mason's Gain formula
		4th(17.02.2024)	4.9. Simple problems in Signal flow graph for network
6	6th Week	1st(19.02.2024)	5 . 1 Time response of control system.
		2nd(19.02.2024)	Standard Test signal. 5.2.1 Step signal
		3rd(20.02.2024)	5 . 3 Time Response of first order system with: 5.3.1. Unit step response
		4th(21.02.2024)	5.3.2. Unit impulse response.
		5th(24.02.2024)	5 . 4 Time response of second order system to the unit step input. 5.4.1. Time response specification

7	7th Week	1st(26.02.2024)	5.4.2. Derivation of expression for rise time, peak time, peak overshoot, settling time and steady state error
		2nd(26.02.2024)	5.4.3. Steady state error and error constants
		3rd(27.02.2024)	5 . 5 Types of control system.[Steady state errors in Type-0, Type-1, Type-2 system]
		4th(28.02.2024)	5 . 6 Effect of adding poles and zero to transfer function
		5th(02.03.2024)	5 . 7 Response with P, PI, PD and PID controller.
8	8th Week	1st(04.03.2024)	6 . 1 Root locus concept.
		2nd(04.03.2024)	6 . 1 Root locus concept.
		3rd(06.03.2024)	6 . 1 Root locus concept.
		4th(09.03.2024)	6 . 2 Construction of root loci.
9	9th Week	1st(11.03.2024)	6 . 2 Construction of root loci.
		2nd(11.03.2024)	6 . 2 Construction of root loci.
		3rd(12.03.2024)	6 . 3 Rules for construction of the root locus.
		4th(13.03.2024)	6 . 3 Rules for construction of the root locus.
		5th(16.03.2024)	6 . 4 Effect of adding poles and zeros to G(s) and H(s)
10	10th Week	1st(18.03.2024)	6 . 4 Effect of adding poles and zeros to G(s) and H(s)
		2nd(18.03.2024)	6 . 4 Effect of adding poles and zeros to G(s) and H(s)
		3rd(19.03.2024)	7 . 1 Correlation between time response and frequency response.
		4th(20.03.2024)	7 . 2 Polar plots.
		5th(23.03.2024)	7 . 2 Polar plots.
11	11th Week	1st(27.03.2024)	7 . 2 Polar plots.
		2nd(30.03.2024)	7 . 3 Bode plots.
12	12th Week	1st(02.04.2024)	7 . 3 Bode plots.
		2nd(03.04.2024)	7 . 4 All pass and minimum phase system.
		3rd(06.04.2024)	7 . 5 Computation of Gain margin and phase margin.
13	13th Week	1st(08.04.2024)	7 . 6 Log magnitude versus phase plot
		2nd(08.04.2024)	7 . 7 Closed loop frequency response.
		3rd(09.04.2024)	8.1 Principle of argument.
		4th(10.04.2024)	8.2 Nyquist stability criterion
		5th(13.04.2024)	8.2 Nyquist stability criterion
14	14th week	1st(15.04.2024)	8.3 Niquist stability criterion applied to inverse polar plot
		2nd(15.04.2024)	8.3 Niquist stability criterion applied to inverse polar plot
		3rd(16.04.2024)	8.4 Effect of addition of poles and zeros to G(S) H(S) on the shape of Niquist plot
		4th(20.04.2024)	8.4 Effect of addition of poles and zeros to G(S) H(S) on the shape of Niquist plot
15	15th week	1st (22.04.2024)	8.5 Assessment of relative stability.
		2nd(22.04.2024)	8.5 Assessment of relative stability.
		3rd(23.04.2024)	8.6 Constant M and N circle
		4th(24.04.2024)	8.7 Nicholas chart.

D.Kan
16/01/2024