

## Department of Electrical Engineering

Branch: Electrical Engineering	Semester: 6 <sup>TH</sup>	Name of the Lecturer: <b>Snigdha Dash</b>
Subject: CSE	No of classes alloted in a week: 6	Duration of Semester: 04.02.02025 - 17.05.2025
Week	Class Day	Theory / practical Topic
1st	1	<b>Fundamental of control system</b> - Classification of Control system
	2	Open loop system & Closed loop system and Its comparison, Effects of Feed back
	3	Standard test Signals (Parabolic, Impulse, Parabolic, Impulse Functions)
	4	Servomechanism
	5	<b>Mathematical model of a system</b> - Transfer Function, Impulse response
	6	Properties, Advantages & Disadvantages of Transfer Function
2nd	1	Poles & Zeroes of transfer Function, Simple problems of transfer function of network
	2	Mathematical modeling of Electrical Systems(R, L, C, Analogous systems)
	3	<b>Control system components</b> - Components of Control System
	4	Gyroscope, Synchros, Tachometer
	5	DC servomotors
	6	Ac Servomotors
3rd	1	<b>Block diagram algebra &amp; signal flow graphs</b> - Basic Elements of Block Diagram
	2	Canonical Form of Closed loop Systems
	3	Rules for Block diagram reduction, Procedure for of Reduction of Block Diagram
	4	Simple Problem for equivalent transfer function
	5	Basic Definition in Signal Flow Graph, Properties of Signal Flow Graph
	6	Construction of Signal Flow graph from Block diagram
4th	1	Mason's Gain formula
	2	Simple problems in Signal flow graph for network
	3	<b>Time response analysis</b> - Time response of control system.
	4	Standard Test signal (Step signal, Ramp Signal, Parabolic Signal, Impulse Signal)
	5	Time response of second order system to the unit step input - Time response specification.
	6	Expression for rise time, peak time, peak overshoot, settling time, steady state error
5th	1	Steady state error & error constants.
	2	Types of control system.[ Steady state errors in Type-0, Type-1, Type-2 system]
	3	Effect of adding poles and zero to transfer function.
	4	Response with P, PI, PD and PID controller.
	5	<b>Analysis of stability by root locus technique</b> - Root locus concept
	6	Root locus concept
6th	1	Construction of root loci.
	2	Construction of root loci.
	3	Rules for construction of the root locus
	4	Rules for construction of the root locus
	5	Effect of adding poles and zeros to G(s)
	6	Effect of adding poles and zeros to H(s)

7th	1	<b>Frequency response of system</b> - Correlation between time and frequency response
	2	Polar plots, Bode plots
	3	All pass and minimum phase system
	4	Computation of Gain margin.
	5	Computation of phase margin
	6	Log magnitude versus phase plot
8th	1	Closed loop frequency response
	2	<b>Nyquist plot</b> - Principle of argument, Nyquist stability criterion
	3	Nyquist stability criterion applied to inverse polar plot
	4	Effect of addition of poles and zeros to $G(S)$ $H(S)$ on the shape of Nyquist plot
	5	Effect of addition of poles and zeros to $G(S)$ $H(S)$ on the shape of Nyquist plot
	6	Assessment of relative stability
9th	1	Constant M and N circle
	2	Nicholas chart.
	3	Previous Year Question
	4	Previous Year Question
	5	Previous Year Question
	6	Previous Year Question

Signature of the  
Lecturer

Signature of the  
H.O.D.