

## Department of Electrical Engineering

Branch: Electrical Engineering	Semester: 6 <sup>TH</sup>	Name of the Lecturer: <b>Chacha Amitav Tripathy</b>
Subject: CSE	No of classes allotted in a week: 5	Duration of Semester: 22.12.2025 - 18.04.2026
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
2nd	1	Properties, Advantages & Disadvantages of Transfer Function
	2	Poles & Zeroes of transfer Function, Simple problems of transfer function of network
	3	Mathematical modeling of Electrical Systems(R, L, C, Analogous systems)
	4	<b>Control system components</b> - Components of Control System
	5	Gyroscope, Synchros, Tachometer
3rd	1	DC servomotors
	2	AC Servomotors
	3	<b>Block diagram algebra &amp; signal flow graphs</b> - Basic Elements of Block Diagram
	4	Canonical Form of Closed loop Systems
	5	Rules for Block diagram reduction, Procedure for of Reduction of Block Diagram
4th	1	Simple Problem for equivalent transfer function
	2	Basic Definition in Signal Flow Graph, Properties of Signal Flow Graph
	3	Construction of Signal Flow graph from Block diagram
	4	Mason's Gain formula
	5	Simple problems in Signal flow graph for network
5th	1	<b>Time response analysis</b> - Time response of control system.
	2	Standard Test signal (Step signal, Ramp Signal,Parabolic Signal, Impulse Signal)
	3	Time response of second order system to the unit step input - Time response specification.
	4	Expression for rise time, peak time, peak overshoot, settling time, steady state error
	5	Simple problems on rise time, peak time, peak overshoot, settling time, steady state error
6th	1	Simple problems on rise time, peak time, peak overshoot, settling time, steady state error
	2	Steady state error & error constants.
	3	Types of control system.[ Steady state errors in Type-0, Type-1, Type-2 system]
	4	Effect of adding poles and zero to transfer function.
	5	Response with P, PI, PD and PID controller.
7th	1	<b>Analysis of stability by root locus technique</b> - Root locus concept
	2	Construction of root loci.
	3	Rules for construction of the root locus
	4	Rules for construction of the root locus
	5	Simple problems on root locus

8th	1	Simple problems on root locus
	2	Simple problems on root locus
	3	Simple problems on root locus
	4	Simple problems on root locus
	5	Effect of adding poles and zeros to $G(s)H(s)$
9th	1	<b>Frequency response of system</b> - Correlation between time and frequency response
	2	Polar plots
	3	Simple problems on polar plot
	4	Bode plots
	5	All pass and minimum phase system
10th	1	Computation of gain margin & phase margin
	2	Simple problems on bode plot
	3	Simple problems on bode plot
	4	Closed loop frequency response
	5	Log magnitude versus phase plot
11th	1	<b>Nyquist plot</b> - Principle of argument
	2	Nyquist stability criterion
	3	Simple problems on nyquist plot
	4	Niquist stability criterion applied to inverse polar plot
	5	Effect of addition of poles and zeros to $G(S) H(S)$ on the shape of Niquist plot
12th	1	Assessment of relative stability
	2	Simple problems on gain margin & phase margin
	3	Simple problems on gain margin & phase margin
	4	Constant M and N circle
	5	Nicholas chart.

**Signature of the  
Lecturer**

**Signature of the  
H.O.D.**

**Signature of the  
Principal**