GIET
In Pursuit of Innovation

GIETPOLYTECHNIC,JAGATPUR,CUTTACK

LESSONPLAN

Discipline: **Electrical.**	**Semester:6th**	**Name of theTeaching Faculty:-Rupak kumar sahoo**
Subject:control system engg.- **(TH-3)**	**No. Of Days Per Week ClassAllotted:** 05P(4P+1T) **Lecture:05**	**Semester From Date:** 22.12.2025 **ToDate:** 15.04.2026 No.ofweeks:15
Week	**ClassDay**	**Theory**
1st	1st	**UNIT1:FUNDAMENTAL OF CONTROL SYSTEM** 1.1:Classfication of control system 1.2:Open loop system
	2nd	1.2:Closed loop system & its comparision
	3rd	1.3:Effects of feedback
	4th	.1.4:Standard test signals(step,ramp)
	5th	1.5:Servo mechanism
2nd	1st	**UNIT2:MATHEMATICAL MODEL OF A SYSTEM** 2.1:Transfer function of a system & impulse response
	2nd	2.2:Properties of a transfer function
	3rd	2.2:Advantages &Disadvantages of transfer function
	4th	2.3:Poles&Zeroes of transfer function
	5th	2.4:Simple problems on transfer function of network
3rd	1st	2.4:Simple problems on transfer function of network
	2nd	2.5:Mathematical modeling of Electrical Systems(R,L,C,Analogous systems)
	3rd	2.5:Mathematical modeling of Electrical Systems(R,L,C, Analogous systems)
	4th	2.5:Mathematical modeling of Electrical Systems(R,L,C,Analogous systems)
	5th	2.5:Simple problems on transfer function of network
4th	1st	2.5:Simple problems on transfer function of network
	2nd	2.5:Simple problems on transfer function of network
	3rd	2.5:Simple problems on transfer function of network
	4th	2.5:Simple problems on transfer function of network
	5th	2.5:Simple problems on transfer function of network
5th	1st	**UNIT3:CONTROLSYSTEMCOMPONENTS** 3.1:Components of control system
	2nd	3.2:Gyroscope,DC servomotors
	3rd	3.2:,Synchros
	4th	3.2:,Tachometer

	5th	3.2:,ac servomotors
6th	1st	**UNIT4:BLOCK DIAGRAM & SIGNAL FLOW GRAPHS** 4.1:Definition of basic elements off block diagram
	2nd	4.2:Canonical form of closed loop system
	3rd	4.3.Rules for Block diagram reduction
	4th	4.4.Procedure for Reduction off Block Diagram
	5th	4.5.Simple Problem for equivalent transfer function
7th	1st	4.6.Basic Definition in Signal Flow Graph& properties
	2nd	4.7.Construction of Signal Flow graph from Block diagram
	3rd	4.8.Mason's Gain formula
	4th	4.9.Simple problems in Signal flow graph for network
	5th	4.9.Simple problems in Signal flow graph for network
8th	1st	**Unit5:TIME RESPONSE ANALYSIS** 5.1Time response of control system
	2nd	5.2Standard Test signal 5.2.1.Step signal
	3rd	5.2.2.RampSignal
	4th	5.2.3.ParabolicSignal
	5th	5.2.4.ImpulseSignal
9th	1st	5.3Time Response of first order system with: 5.3.1.Unitstepresponse
	2nd	5.3.2.Unitimpulseresponse
	3rd	5.4Time response of second order system to the unit step input. 5.4.1.Time response specification
	4th	5.4.2.Derivation of expression for risetime,peak time,peak settling time and steady state error
	5th	5.4.3.Steady state error and error constants
10th	1st	5.5Types of control system.[Steady state errors inType-0,Type-1 Type-2 system]
	2nd	5.6.Effect of adding poles and zero to transfer function
	3rd	5.7.Response with P,PI,PD and PID controller)
	4th	5.7.ResponsewithP,PI,PD and PID controller)
	5th	5.7.ResponsewithP,PI,PDand PID controller
11th	1st	**UNIT6:.ANALYSIS OF STABILITY BY ROOT LOCUS TECHNIQUE** 6.1.Root locus concept
	2nd	6.2.Construction of root loci.
	3rd	6.3.Rules for construction of the root locus.
	4th	6.4.Effect of adding poles and zeros to G(s)and H(s).
	5th	6.4.Effect of adding poles and zeros to G(s)andH(s).

12th	1st	**UNIT7:FREQUENCYRESPONSE ANALYSIS** 7.1Correlation between time response and frequency response
	2nd	7.2.Polar plots
	3rd	7.3.Bode plots.
	4th	7.4.All pass and minimum phase system.
	5th	7.5.Computation of Gain margin and phase margin
13th	1st	7.5.Computation of Gain margin and phase margin
	2nd	7.5.Computation of Gain margin and phase margin
	3rd	7.5.Computation of Gain margin and phase margin
	4th	7.5.Computation of Gain margin and phase margin
	5th	7.5.Computation of Gain margin and phase margin
14th	1st	**UNIT8:NYQUISTPLOT** 8.1Principle of argument.
	2nd	8.2 Nyquist stability criterion.
	3rd	8.3 Niquist stability criterion applied to inverse polar plot.
	4th	8.4Effect of addition of poles and zeros to G(S)H(S) on the shape plot
	5th	8.5Assessment of relative stability
15th	1st	8.6Constant M and N circle]
	2nd	8.7Nicholas chart
	3rd	8.7Nicholas chart
	4th	REVISION
	5th	PREVIOUSYEARQUESTION&ANSWERSOLVE

23.12.25
Sign. of faculty

23.12.25
Sign. of sr. lecturer

23.12.24
Sign. of principal

Head of Dept. (HOD)
Electrical & ETC E
G E T (A) M