



**GOVERNMENT POLYTECHNIC KORAPUT
DEPT. OF ELECTRICAL ENGG.**

Discipline:	Semester:	Name of the Teaching Faculty: SANDHYA KUMARI RANDHI	
Subject: CONTROL SYSTEM ENGG.	No. of Days/per week class allotted: 5	Semester From Date: No. of Weeks: 15	To Date:
Week	Class Day	Theory/Practical Topics	
1 st	01	Classification of Control system	
	02	Open loop system & Closed loop system and its comparison	
	03	Effects of Feed back	
	04	Standard test Signals(Step, Ramp, Parabolic, Impulse Functions)	
	05	Servomechanism	
2 nd	01	Transfer Function & Impulse response	
	02	Properties, Advantages & Disadvantages of Transfer Function	
	03	Poles & Zeroes of transfer Function	
	04	Simple problems of transfer function of network.	
	05	Mathematical modeling of Electrical Systems(R, L, C, Analogous systems)	
3 rd	01	Tutorial	
	02	Components of Control System	
	03	Gyroscope, Synchros, Tachometer	
	04	DC servomotors, Ac Servomotors	
	05	Tutorial	
4 th	01	Definition: Basic Elements of Block Diagram ,Canonical Form of Closed loop Systems	
	02	Rules for Block diagram reduction	
	03	Procedure for of Reduction of Block Diagram	
	04	Simple Problem for equivalent transfer function	
	05	TUTORIAL	
5 th	01	Basic Definition in Signal Flow Graph & properties	
	02	Construction of Signal Flow graph from Block diagram	
	03	Mason's Gain formula	
	04	Simple problems in Signal flow graph for network	
	05	TUTORIAL	
6 th	01	Time response of control system.Standard Test signal.Step signal, Ramp Signal	
	02	Parabolic Signal ,Impulse Signal	
	03	Time Response of first order system with: 5.3.1. Unit step response 5.3.2. Unit impulse response.	
	04	Time response of second order system to the unit step input.	
	05	Time response specification	
7 th	01	Derivation of expression for rise time, peak time, peak overshoot, settling time and steady state error.	
	02	TUTORIAL	



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	03	Steady state error and error constants
	04	Types of control system.[Steady state errors in Type-0, Type-1, Type-2 system]
	05	Effect of adding poles and zero to transfer function.
8 th	01	Response with P, PI, PD and PID controller.
	02	TUTORIAL
	03	Root locus concept.
	04	Construction of root loci.
	05	TUTORIAL
9 th	01	Rules for construction of the root locus
	02	Rules for construction of the root locus
	03	PLOT CONSTRUCTION PRACTICE
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	05	PLOT CONSTRUCTION PRACTICE
10 th	01	Effect of adding poles and zeros to $G(s)$ and $H(s)$.
	02	EXAMPLES
	03	TUTORIAL
	04	Correlation between time response and frequency response
	05	Polar plots
11 th	01	Polar plots
	02	TUTORIAL
	03	Bode plots
	04	Bode plots
	05	All pass and minimum phase system.
12 th	01	Computation of Gain margin and phase margin
	02	Log magnitude versus phase plot
	03	Closed loop frequency response
	04	EXAMPLES
	05	TUTORIAL
13 th	01	Principle of argument.
	02	Nyquist stability criterion.
	03	Nyquist stability criterion applied to inverse polar plot.
	04	EXAMPLES
	05	EXAMPLES
14 th	01	Effect of addition of poles and zeros to $G(S)$ $H(S)$ on the shape of Niquist plot.
	02	EXAMPLES
	03	EXAMPLES
	04	Constant M and N circle
	05	Assessment of relative stability.
15 th	01	Nicholas chart
	02	TUTORIAL
	03	TUTORIAL
	04	TUTORIAL
	05	TUTORIAL

(Signature of concerned faculty)

(HOD Electrical)