

GOVERNMENT POLYTECHNIC, SAMBALPUR, RENGALI

DEPARTMENT OF E&TC ENGINEERING

LESSON PLAN

SUBJECT- CONTROL SYSTEM AND COMPONENTS (TH-2)

SEMESTER-6TH

NAME OF THE FACULTY- MS. LOPAMUDRA BHOI

TOTAL NO. OF PERIODS-60(4/W)

UNIT	DATE	PERIOD	TOPICS TO BE COVERED AS PER SYALLABUS
1	4 th week of March,2022		Fundamental of Control System
		1	Classification of Control system
		2	Open loop system & Closed loop system and its comparison
		3	Effects of Feed back
		4	Standard test Signals(Step, Ramp, Parabolic, Impulse Functions)
		5	Servomechanism
		6	Regulators (Regulating systems)
		7	Previous year questions discussion & assignments
2	2 nd week of April,2022		Transfer Functions
		1	Transfer Function of a system & Impulse response
		2	Properties, Advantages & Disadvantages of Transfer Function
		3	Poles & Zeroes of transfer Function
		4	Representation of poles & Zero on the s-plane
		5	Simple problems of transfer function of network
		6	Previous year questions discussion & assignments
3	3 rd week of April,2022		Control system Components & mathematical modelling of physical System
		1	Components of Control System
		2	Potentiometer, Synchronizers, Diode modulator & demodulator
		3	DC motors, AC Servomotors
		4	Modelling of Electrical Systems(R, L, C, Analogous systems)
		5	Previous year questions discussion & assignments
4	2 nd week of May,2022		Block Diagram & Signal Flow Graphs(SFG)
		1	Definition of Basic Elements of a Block Diagram
		2	Canonical Form of Closed loop Systems
		3	Rules for Block diagram Reduction
		4	Procedure for of Reduction of Block Diagram
		5	Simple Problem for equivalent transfer function
		6	Basic Definition in SFG & properties
		7	Mason's Gain formula
		8	Steps for solving Signal flow Graph
		9	Simple problems in Signal flow graph for network
		10	Previous year questions discussion & assignments
5	4 th week of May,2022		Time Domain Analysis of Control Systems
		1	Definition of Time, Stability, steady-state response, accuracy, transient accuracy, Insensitivity and robustness.

		2	System Time Response
		3	Analysis of Steady State Error
		4	Types of Input & Steady state Error(Step ,Ramp, Parabolic)
		5	Parameters of first order system & second-order systems
		6	Derivation of time response Specification (Delay time, Rise time, Peak time, Setting time, Peak over shoot)
		7	Previous year questions discussion & assignments
6	1 st week of June,2022		Feedback Characteristics of Control Systems
		1	Effect of parameter variation in Open loop System & Closed loop Systems
		2	Introduction to Basic control Action& Basic modes of feedback control: proportional, integral and derivative
		3	Effect of feedback on overall gain, Stability
		4	Realisation of Controllers(P, PI,PD,PID) with OPAMP
		5	Previous year questions discussion & assignments
7	2 nd week of June,2022		Stability concept& Root locus Method
		1	Effect of location of poles on stability
		2	Routh-Hurwitz stability criterion.
		3	Steps for Root locus method
		4	Root locus method of design(Simple problem)
		5	Previous year questions discussion & assignments
8	3 rd week of June,2022		Frequency-response analysis& Bode plot
		1	Frequency response, Relationship between time & frequency response
		2	Methods of Frequency response
		3	Polar plots & steps for polar plot
		4	Bodes plot & steps for Bode plots
		5	Stability in frequency domain, Gain Margin& Phase margin
		6	Nyquist plots, Nyquist stability criterion.
		7	Simple problems as above
		8	Previous year questions discussion & assignments
9	4 th week of June,2022		State variable Analysis
		1	Concepts of state, state variable, state model,
		2	state modelsfor linear continuous time functions(Simple)
		3	Previous year questions discussion & assignments