ACADEMIC LESSION PLAN FOR SUMMER SEMESTER – 2022

Dept. of Electronics & Telecommunication, Govt. Polytechnic, Balasore
Name of the Faculty: PRAKASH CHANDRA DAS
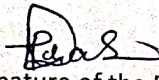### TH2: CONTROL SYSTEMS & COMPONENT

LESSON PLAN (SUMMER-2022)		
Discipline: ELECTRONICS & TELECOMMUNICATION ENGINEERING	**SEMESTER:** 6th	**Name of the Teaching Faculty: PRAKASH CHANDRA DAS**
Subject: Control Systems & Component	**No of Days /per week class allotted:** 4	**Semester From date: 10.03.2022 To date: 10.06.2022** **No of Weeks: 15**

Week	Class Day	Theory
1st	1st	**Fundamental of Control System** Classification of Control system
	2nd	Open loop system & Closed loop system and its comparison
	3rd	Open loop system & Closed loop system and its comparison
	4th	Effects of Feed back Standard test Signals(Step, Ramp, Parabolic, Impulse Functions)
2nd	1st	Servomechanism , Regulators (Regulating systems)
	2nd	**Transfer Functions** Transfer Function of a system & Impulse response,
	3rd	Transfer Function of a system & Impulse response,
	4th	Properties, Advantages& Disadvantages of Transfer Function
3rd	1st	Poles & Zeroes of transfer Function
	2nd	Representation of poles & Zero on the s-plane
	3rd	Representation of poles & Zero on the s-plane
	4th	Simple problems of transfer function of network
4th	1st	Simple problems of transfer function of network
	2nd	**Control system Components & mathematical modelling of physical System** Components of Control System
	3rd	Potentiometer, Synchros
	4th	Diode modulator & demodulator ,
5th	1st	DC motors, AC Servomotors
	2nd	Modelling of Electrical Systems(R, L, C, Analogous systems)
	3rd	**Block Diagram & Signal Flow Graphs(SFG)** Definition of Basic Elements of a Block Diagram Canonical Form of Closed loop Systems
	4th	Rules for Block diagram Reduction
6th	1st	Rules for Block diagram Reduction
	2nd	Procedure for of Reduction of Block Diagram
	3rd	Simple Problem for equivalent transfer function
	4th	Basic Definition in SFG & properties Mason's Gain formula
7th	1st	Steps for solving Signal flow Graph
	2nd	Simple problems in Signal flow graph for network

	3rd	**Time Domain Analysis of Control Systems** Definition of Time, Stability, steady-state response, accuracy, transient accuracy, In-sensitivity and robustness
	4th	System Time Response Analysis of Steady State Error
8th	1st	Types of Input & Steady state Error(Step ,Ramp, Parabolic)
	2nd	Types of Input & Steady state Error(Step ,Ramp, Parabolic)
	3rd	Parameters of first order system & second-order systems
	4th	Parameters of first order system & second-order systems
9th	1st	Derivation of time response Specification (Delay time, Rise time, Peak time, Setting time ,Peak over shoot)
	2nd	Derivation of time response Specification (Delay time, Rise time, Peak time, Setting time, Peak over shoot)
	3rd	**Feedback Characteristics of Control Systems** Effect of parameter variation in Open loop System & Closed loop Systems
	4th	Effect of parameter variation in Open loop System & Closed loop Systems
10th	1st	Introduction to Basic control Action& Basic modes of feedback control: proportional, integral and derivative
	2nd	proportional, integral and derivative
	3rd	Effect of feedback on overall gain, Stability
	4th	Realisation of Controllers(P, PI,PD,PID) with OPAMP
11th	1st	**Stability concept& Root locus Method** Effect of location of poles on stability
	2nd	Routh Hurwitz stability criterion.
	3rd	Routh Hurwitz stability criterion.
	4th	Steps for Root locus method
12th	1st	Steps for Root locus method
	2nd	Root locus method of design(Simple problem)
	3rd	Root locus method of design(Simple problem)
	4th	Root locus method of design(Simple problem)
13th	1st	**Frequency-response analysis & Bode Plot** Frequency response, Relationship between time & frequency response
	2nd	Methods of Frequency response
	3rd	Polar plots & steps for polar plot
	4th	Bodes plot & steps for Bode plots
14th	1st	Stability in frequency domain, Gain Margin& Phase margin
	2nd	Nyquist plots. Nyquist stability criterion.
	3rd	Simple problems as above Previous year questions discussion
	4th	**State variable Analysis** Concepts of state, state variable, state model,
15th	1st	Concepts of state, state variable, state model,
	2nd	State models for linear continuous time functions(Simple)
	3rd	State models for linear continuous time functions(Simple)
	4th	State models for linear continuous time functions. Class test / Model semester questions discussion

HOD   Academic Coordinator   Signature of the Faculty