ACADEMIC LESSION PLAN FOR SUMMER SEMESTER – 2023

Dept. of Electronics & Telecommunication, Govt. Polytechnic, Balasore

Name of the Faculty: PRAKASH CHANDRA DAS

***TH2:* CONTROL SYSTEMS & COMPONENT**

LESSON PLAN (SUMMER-2023)		
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: 14/02/2023 To date:- 23/05/2023** **No of Weeks:15**
Week	**Class Day**	**Theory / Practical Topics**
1st	1st	1. Fundamental of Control System
	2nd	1.1 Classification of Control system
	3rd	1.2 Open loop system & Closed loop system and its comparison
	4th	1.3 Effects of Feed back
2nd	1st	1.4 Standard test Signals(Step, Ramp, Parabolic, Impulse Functions)
	2nd	1.5 Servomechanism
	3rd	1.6 Regulators (Regulating systems)
	4th	2. Transfer Functions
3rd	1st	2.1 Transfer Function of a system & Impulse response,
	2nd	2.2 Properties,Advantages& Disadvantages of Transfer Function
	3rd	2.3 Poles & Zeroes of transfer Function
	4th	2.4 Representation of poles & Zero on the s-plane
4th	1st	2.5 Simple problems of transfer function of network
	2nd	3. Control system Components & mathematical modelling of physical System
	3rd	3.1 Components of Control System
	4th	3.2 Potentiometer, Synchros, Diode modulator & demodulator ,
5th	1st	3.3 DC motors, AC Servomotors
	2nd	AC Servomotors
	3rd	3.4 Modelling of Electrical Systems(R, L, C, Analogous systems)
	4th	4. Block Diagram & Signal Flow Graphs(SFG)
6th	1st	4.1 Definition of Basic Elements of a Block Diagram
	2nd	4.2 Canonical Form of Closed loop Systems
	3rd	4.3 Rules for Block diagram Reduction
	4th	4.4 Procedure for of Reduction of Block Diagram
7th	1st	4.5 Simple Problem for equivalent transfer function
	2nd	4.6 Basic Definition in SFG & properties
	3rd	4.7 Mason's Gain formula
	4th	4.8 Steps foe solving Signal flow Graph
8th	1st	4.9 Simple problems in Signal flow graph for network
	2nd	5. Time Domain Analysis of Control Systems

	3rd	5.1 Definition of Time, Stability, steady-state response, accuracy, transient accuracy,
	4th	In-sensitivity and robustness.
9th	1st	5.2 System Time Response
	2nd	5.3 Analysis of Steady State Error
	3rd	5.4 Types of Input & Steady state Error(Step ,Ramp, Parabolic)
	4th	5.5 Parameters of first order system & second-order systems
10th	1st	5.6 Derivation of time response Specification (Delay time, Rise time, Peak
	2nd	time,Setting time,Peak over shoot)
	3rd	6. FeedbackCharacteristics of Control Systems
	4th	6.1 Effect of parameter variation in Open loop System & Closed loop Systems
11th	1st	6.2 Introduction to Basic control Action& Basic modes of feedback control:
	2nd	proportional, integral and derivative
	3rd	6.3 Effect of feedback on overall gain, Stability
	4th	6.4 Realisation of Controllers(P, PI,PD,PID) with OPAMP
12th	1st	7. Stability concept& Root locus Method
	2nd	7.1 Effect of location of poles on stability
	3rd	7.2 RouthHurwitz stability criterion.
	4th	7.3 Steps for Root locus method
13th	1st	7.4 Root locus method of design(Simple problem)
	2nd	8. Frequency-response analysis&Bode Plot
	3rd	8.1 Frequencyresponse,Relationship between time & frequency response
	4th	8.2 Methods of Frequency response
14th	1st	8.3 Polar plots & steps for polar plot
	2nd	8.4 Bodes plot & steps for Bode plots
	3rd	8.5 Stability in frequency domain, Gain Margin& Phase margin
	4th	8.6 Nyquist plots. Nyquiststability criterion.
15th	1st	8.7 Simple problems as above
	2nd	9. State variable Analysis-
	3rd	9.1 Concepts of state, state variable, state model,
	4th	9.2 state modelsfor linear continuous time functions(Simple)

Prakash Chandra Dey
Signature of Faculty

14/2/23
H.O.D

Principal

21/2/23