LESSON PLAN (SUMMER-2023)

Discipline:ETC	**Semester:6th**	**Name of the Teaching Faculty: SATYABRATA SAHOO**
Subject:Control System	**No of Days /per week class allotted:4**	**Semester From date: 14.02.2023 To date: 23.05.2023** **No of Weeks:14**
Week	**Class Day**	**Theory / Practical Topics**
1st	1st	**1.Fundamental of Control System(5)** 1.1 Classification of Control system
	2nd	1.2 Open loop system & Closed loop system and its comparison
	3rd	1.3 Effects of Feed back
	4th	1.4 Standard test Signals(Step, Ramp, Parabolic, Impulse Functions)
2nd	1st	1.5 Servomechanism 1.6 Regulators (Regulating systems)
	2nd	**2.Transfer Functions(8)** 2.1 Transfer Function of a system & Impulse response
	3rd	2.2 Properties,Advantages& Disadvantages of Transfer Function
	4th	2.3 Poles & Zeroes of transfer Function, 2.4 Representation of poles & Zero on the s-plane
3rd	1st	2.5 Simple problems of transfer function of network
	2nd	2.5 Continue
	3rd	2.5 Continue
	4th	2.5 Continue
4th	1st	2.5 Continue
	2nd	**3.Control system Components & mathematical modelling of physical System(5)** 3.1 Components of Control System
	3rd	3.2 Potentiometer, Synchros
	4th	3.2 continue, 3.3 DC motors, AC Servomotors
5th	1st	AC Servomotors 3.4 Modelling of Electrical Systems(R, L, C, Analogous systems)
	2nd	3.4 continue
	3rd	**4.Block Diagram & Signal Flow Graphs(SFG)(8)** 4.1 Definition of Basic Elements of a Block Diagram
	4th	4.2 Canonical Form of Closed loop System
6th	1st	4.3 Rules for Block diagram Reduction,
	2nd	continue
	3rd	4.6 Basic Definition in SFG & properties
	4th	4.7 Mason's Gain formula, 4.8 Steps for solving Signal flow Graph
7th	1st	4.9 Simple problems in Signal flow graph for network
	2nd	continue
	3rd	**5.Time Domain Analysis of Control Systems(8)** 5.1 Definition of Time, Stability, steady-state response, accuracy, transient accuracy, In-sensitivity and robustness.
	4th	5.2 System Time Response
8th	1st	5.3 Analysis of Steady State Error
	2nd	5.4 Types of Input & Steady state Error(Step ,Ramp, Parabolic)
	3rd	5.5 Parameters of first order system & second-order systems
	4th	continue

9th	1st	5.6 Derivation of time response Specification (Delay time, Rise time, Peak time,Setting time,Peak over shoot)
	2nd	continue
	3rd	**6.FeedbackCharacteristics of Control Systems(6)** 6.1 Effect of parameter variation in Open loop System & Closed loop Systems
	4th	6.2 Introduction to Basic control Action& Basic modes of feedback control: proportional, integral and derivative
10th	1st	continue
	2nd	6.3 Effect of feedback on overall gain, Stability
	3rd	6.4 Realisation of Controllers(P, PI,PD,PID) with OPAMP
	4th	continue
11th	1st	**7.Stability concept& Root locus Method(8)** 7.1 Effect of location of poles on stability
	2nd	7.2 RouthHurwitz stability criterion.
	3rd	7.3 Steps for Root locus method
	4th	7.4 Root locus method of design(Simple problem)
12th	1st	continue
	2nd	continue
	3rd	continue
	4th	continue
13th	1st	**8.Frequency-response analysis&Bode Plot(7)** 8.1 Frequencyresponse,Relationship between time & frequency response
	2nd	8.2 Methods of Frequency response, 8.3 Polar plots & steps for polar plot
	3rd	8.4 Bodes plot & steps for Bode plots
	4th	continue
14th	1st	8.5 Stability in frequency domain, Gain Margin& Phase margin
	2nd	8.6 Nyquist plots. Nyquiststability criterion.
	3rd	8.7 Simple problems as above
	4th	**9.State variable Analysis(5)** 9.1 Concepts of state, state variable, state model,
15th (EXTRA)	1st	continue
	2nd	9.2 state modelsfor linear continuous time functions(Simple)
	3rd	continue
	4th	continue

Signature of the Faculty