BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

ELECTRICAL ENGG.DEPARTMENT

LESSON PLAN

SEMESTER: 6TH(C)

SESSION – SUMMER (2022-23)

SUBJECT: CONTROL SYSTEM

NAME OF FACULTY:Mr. SRIKANTA THAKUR

Discipline: **Electrical Engg.**	Semester:**6Th (C)**	Name of the teaching faculty:**Mr. SRIKANTA THAKUR**
Subject-**CONTROL SYSTEM ENGNEERING**	No. of Days/per week class allotted: **05PERIODS /WEEK (MON-1,TUE-1,WED-1,THUR-1,FRI-1 PERIOD)**	Semester: From Date: **10/03/2022** To **10/06/2022** No. of weeks: **15 WEEKS**
Week	**Class Day**	**Theory/Practical Topics**
1st (14/02/2023-18/02/2023)	14/02/2023	**1. FUNDAMENTAL OF CONTROL SYSTEM** 1.1. Classification of Control system
	15/02/2023	1.2. Open loop system & Closed loop system and its comparison
	16/02/2023	1.3. Effects of Feed back
	17/02/2023	1.4. Standard test Signals(Step, Ramp, Parabolic, Impulse Functions)
2nd (20/02/2023-25/02/2023)	20/02/2023	1.5. Servomechanism
	21/02/2023	**2. MATHEMATICAL MODEL OF A SYSTEM** 2.1. Transfer Function & Impulse response,
	22/02/2023	2.2. Properties, Advantages & Disadvantages of Transfer Function
	23/02/2023	2.3. Poles & Zeroes of transfer Function
	24/02/2023	2.4. Simple problems of transfer function of network.
3rd (27/02/202-04/03/2023)	27/02/2023	2.4. Simple problems of transfer function of network.
	28/02/2023	2.5. Mathematical modeling of Electrical Systems(R, L, C, Analogous systems)
	01/03/2023	**3. CONTROL SYSTEM COMPONENTS** 3.1. Components of Control System
	02/03/2023	3.2. Gyroscope, Synchros, Tachometer, DC servomotors,

		Ac Servomotors
	03/03/2023	3.2. Gyroscope, Synchros, Tachometer, DC servomotors, Ac Servomotors
4th (06/03/2023-11/03/2023)	06/03/2023	**4. BLOCK DIAGRAM ALGEBRA & SIGNAL FLOW GRAPHS** 4.1. Definition: Basic Elements of Block Diagram
	07/03/2023	**DOLA PURNIMA**
	08/03/2023	**HOLI**
	09/03/2023	**CLASS TEST-I**
	10/03/2023	4.2. Canonical Form of Closed loop Systems
5TH (13/03/2023-18/03/2023)	13/03/2023	4.3. Rules for Block diagram reduction
	14/03/2023	4.4. Procedure for of Reduction of Block Diagram
	15/03/2023	4.5. Simple Problem for equivalent transfer function
	16/03/2023	4.5. Simple Problem for equivalent transfer function
	17/03/2023	4.6. Basic Definition in Signal Flow Graph & properties
6TH (20/03/2023-25/03/2023)	20/03/2023	4.7. Construction of Signal Flow graph from Block diagram
	21/03/2023	4.8. Mason's Gain formula
	22/03/2023	4.9. Simple problems in Signal flow graph for network
	23/03/2023	4.9. Simple problems in Signal flow graph for network
	24/03/2023	**5. TIME RESPONSE ANALYSIS.** 5. 1 Time response of control system.
7th (27/03/2023-01/04/2023)	27/03/2023	5. 2 Standard Test signal.
	28/03/2023	5.2.1. Step signal, 5.2.2. Ramp Signal
	29/03/2023	5.2.3. Parabolic Signal 5.2.4. Impulse Signal
	30/03/2023	**RAM NAVAMI**

	31/03/2023	5. 3 Time Response of first order system with: 5.3.1. Unit step response
8th (03/04/2023-08/04/2023)	03/04/2023	5.3.2. Unit impulse response.
	04/04/2023	**QUIZ TEST**
	05/04/2023	5. 4 Time response of second order system to the unit step input. 5.4.1. Time response specification.
	06/04/2023	5.4.2. Derivation of expression for rise time, peak time, peak overshoot, settling time and steady state error.
	07/04/2023	**GOOD FRIDAY**
9th (10/04/2023-15/04/2023)	10/04/2023	5.4.2. Derivation of expression for rise time, peak time, peak overshoot, settling time and steady state error.
	11/04/2023	5.4.3. Steady state error and error constants.
	12/04/2023	5. 5 Types of control system.[Steady state errors in Type-0, Type-1, Type-2 system]
	13/04/2023	5. 6 Effect of adding poles and zero to transfer function.
	14/04/2023	**AMBEDKAR JAYANTI**
10th (17/04/2023-22/04/2023)	17/04/2023	5. 7 Response with P, PI, PD and PID controller.
	18/04/2023	**INTERNAL ASSESSMENT**
	19/04/2023	**INTERNAL ASSESSMENT**
	20/04/2023	**PROBLEM SOLVE**
	21/04/2023	**PROBLEM SOLVE**
11th (24/04/2023-29/04/2023)	24/04/2023	**6. ANALYSIS OF STABILITY BY ROOT LOCUS TECHNIQUE.** 6. 1 Root locus concept.
	25/04/2023	6. 2 Construction of root loci.
	26/04/2023	6. 3 Rules for construction of the root locus.

	27/04/2023	6. 3 Rules for construction of the root locus.
	28/04/2023	6. 4 Effect of adding poles and zeros to G(s) and H(s).
12th (01/05/2023-06/05/2023)	01/05/2023	**FREQUENCY RESPONSE ANALYSIS.** 7. 1 Correlation between time response and frequency response. 7. 2 Polar plots.
	02/05/2023	7. 3 Bode plots.
	03/05/2023	7. 4 All pass and minimum phase system.
	04/05/2023	7. 5 Computation of Gain margin and phase margin.
	05/05/2023	**BUDDHA JAYANTI**
13th (08/05/2023-13/05/2023)	08/05/2023	7. 6 Log magnitude versus phase plot.
	09/05/2023	7. 7 Closed loop frequency response.
	10/05/2023	**QUIZ TEST**
	11/05/2023	**8. NYQUIST PLOT** 8.1 Principle of argument.
	12/05/2023	8.2 Nyquist stability criterion.
14th (15/05/2023-20/05/2023)	15/05/2023	8.3 Niquist stability criterion applied to inverse polar plot.
	16/05/2023	8.4 Effect of addition of poles and zeros to G(S) H(S) on the shape of Niquist plot.
	17/05/2023	8.5 Assessment of relative stability. 8.6 Constant M and N circle
	18/05/2023	8.7 Nicholas chart.
	19/05/2023	**SABITRI AMABASYA**
15th (22/05/2023- 27/05/2023)	22/05/2023	Previous year question
	23/05/2023	Previous year question