

BHUBANANANDA ORISSA SCHOOL OF
ENGINEERING, CUTTACK
ELECTRICAL ENGG.DEPARTMENT

LESSON PLAN

SEMESTER: 6TH (C)

SESSION – SUMMER (2021-22)

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	No. of Days/per week class allotted: 05 PERIODS /WEEK (MON-1,TUE-1,WED-1,THUR-2 PERIOD)	Semester: From Date: 10/03/2022 To Date: 10/06/2022 No. of weeks: 14 WEEKS
Week	Class Day	Theory/Practical Topics
1 st (10/03/2022-12/03/2022)	10/03/2022	1. FUNDAMENTAL OF CONTROL SYSTEM 1.1. Classification of Control system 1.2. Open loop system & Closed loop system and its comparison
2 nd (14/03/2022-19/03/2022)	14/03/2022	1.3. Effects of Feed back
	15/03/2022	1.4. Standard test Signals(Step, Ramp, Parabolic, Impulse Functions)
	16/03/2022	1.5. Servomechanism
	17/03/2022	2. MATHEMATICAL MODEL OF A SYSTEM 2.1. Transfer Function & Impulse response, 2.2. Properties, Advantages & Disadvantages of Transfer Function
3 rd (21/03/2022-26/03/2022)	21/03/2022	2.3. Poles & Zeroes of transfer Function
	22/03/2022	2.4. Simple problems of transfer function of network.
	23/03/2022	2.5. Mathematical modeling of Electrical Systems(R, L, C, Analogous systems)
	24/03/2022	3. CONTROL SYSTEM COMPONENTS 3.1. Components of Control System
4 th (28/03/2022-02/04/2022)	28/03/2022	3.2. Gyroscope, Synchros, Tachometer, DC servomotors,

		Ac Servomotors
	29/03/2022	3.2. Gyroscope, Synchros, Tachometer, DC servomotors, Ac Servomotors
	30/03/2022	4. BLOCK DIAGRAM ALGEBRA & SIGNAL FLOW GRAPHS
	31/03/2022	4.1. Definition: Basic Elements of Block Diagram
		4.2. Canonical Form of Closed loop Systems
		4.3. Rules for Block diagram reduction
5 TH (04/04/2022-09/04/2022)	04/04/2022	4.4. Procedure for of Reduction of Block Diagram
	05/04/2022	4.5. Simple Problem for equivalent transfer function
	06/04/2022	CLASS TEST
	07/04/2022	4.6. Basic Definition in Signal Flow Graph & properties
6 TH (11/04/2022-16/04/2022)	11/04/2022	4.7. Construction of Signal Flow graph from Block diagram
	12/04/2022	4.8. Mason's Gain formula
	13/04/2022	4.9. Simple problems in Signal flow graph for network
	14/04/2022	AMBEDKAR JAYANTI
	15/04/2022	5. TIME RESPONSE ANALYSIS.
		5. 1 Time response of control system.
7 th (18/04/2022-23/04/2022)	18/04/2022	5. 2 Standard Test signal.
		5.2.1. Step signal,
		5.2.2. Ramp Signal
		5.2.3. Parabolic Signal
		5.2.4. Impulse Signal
	19/04/2022	5. 3 Time Response of first order system with:
		5.3.1. Unit step response
	20/04/2022	5.3.2. Unit impulse response.
	21/04/2022	5. 4 Time response of second order system to the unit step input.
8 th (25/04/2022-30/04/2022)	25/04/2022	5.4.1. Time response specification.

	26/04/2022	5.4.2. Derivation of expression for rise time, peak time, peak overshoot, settling time and steady state error.
	27/04/2022	5.4.3. Steady state error and error constants.
	28/04/2022	5. 5 Types of control system.[Steady state errors in Type-0, Type-1, Type-2 system] 5. 6 Effect of adding poles and zero to transfer function.
9 th (01/05/2022-07/05/2022)	02/05/2022	5. 7 Response with P, PI, PD and PID controller.
	03/05/2022	ID-UL-FITRE
	04/05/2022	CLASS TEST
	05/05/2022	6. ANALYSIS OF STABILITY BY ROOT LOCUS TECHNIQUE.
		6. 1 Root locus concept.
10 th (09/05/2022-14/05/2022)	09/05/2022	6. 2 Construction of root loci.
	10/05/2022	6. 3 Rules for construction of the root locus.
	11/05/2022	INTERNAL ASSESSMENT
	12/05/2022	INTERNAL ASSESSMENT
11 th (16/05/2022-21/05/2022)	16/05/2022	BUDDHA PURNIMA
	17/05/2022	6. 3 Rules for construction of the root locus.
	18/05/2022	6. 4 Effect of adding poles and zeros to G(s) and H(s).
	19/05/2022	FREQUENCY RESPONSE ANALYSIS.
		7. 1 Correlation between time response and frequency response.
		7. 2 Polar plots.
12 th (23/05/2022-28/05/2022)	23/05/2022	7. 3 Bode plots.
	24/05/2022	7. 4 All pass and minimum phase system.
	25/05/2022	7. 5 Computation of Gain margin and phase margin.

	26/05/2022	7. 6 Log magnitude versus phase plot. 7. 7 Closed loop frequency response.
13 th (30/05/2022-04/06/2022)	30/05/2022	SABITRI AMABASYA
	31/05/2022	8. NYQUIST PLOT
	01/06/2022	8.1 Principle of argument. 8.2 Nyquist stability criterion.
	02/06/2022	8.3 Niquist stability criterion applied to inverse polar plot.
14 th (06/06/2022-10/06/2022)	06/06/2022	8.4 Effect of addition of poles and zeros to $G(S)$ $H(S)$ on the shape of Niquist plot.
	07/06/2022	CLASS TEST
	08/06/2022	8.5 Assessment of relative stability. 8.6 Constant M and N circle
	09/06/2022	8.7 Nicholas chart.