Bhubanananda Orissa School of Engineering
Lesson Plan

Discipline: ETC	**Semester:6th**	**Name of the Teaching Faculty: Pradeep Kumar Dhal Samant, Lecturer in ETC**
Subject: CONTROL SYSTEMS & COMPONENT	No of Days/per week class allotted: 4 (Mon, Tues, Thurs & Friday)	Semester from 10.03.2022 to 10.06.2022 No of weeks: 14
Week No.	Class Day	Theory Topics
1st	10-03-2022	**Unit 1. Fundamental of Control System** 1.1 Classification of Control system 1.2 Open loop system & Closed loop system and its comparison
	11-03-2022	1.3 Effects of Feed back 1.4 Standard test Signals (Step, Ramp, Parabolic, Impulse Functions)
2nd	14-03-2022	1.5 Servomechanism 1.6 Regulators (Regulating systems)
	15-03-2022	**Unit 2. Transfer Functions** 2.1 Transfer Function of a system & Impulse response.
	17-03-2022	2.2 Properties, advantages & disadvantages of Transfer function.
3rd	21-03-2022	2.3 Poles & zeroes of Transfer function. 2.4 Representation of poles & Zero on the s-plane.
	22-03-2022	2.5 Simple problems of transfer function of network.
	24-03-2022	**Unit 3. Control system Components & mathematical modelling of physical system** 3.1 Components of Control System 3.2 Potentiometer, Diode modulator & demodulator
	25-03-2022	3.2 Synchros
4th	28-03-2022	3.3 DC motors, AC Servomotors
	29-03-2022	3.4 Modelling of Electrical Systems (R, L, C, Analogous systems)
	31-03-2022	**Unit 4. Block Diagram & Signal Flow Graphs (SFG)** 4.1 Definition of Basic Elements of a Block Diagram 4.2 Canonical Form of Closed loop Systems
5th	04-04-2022	4.3 Rules for Block diagram Reduction
	05-04-2022	4.4 Procedure for of Reduction of Block Diagram
	07-04-2022	4.5 Simple Problem for equivalent transfer function
	08-04-2022	4.6 Basic Definition in SFG & properties 4.7 Mason's Gain formula
6th	11-04-2022	4.8 Steps for solving Signal flow Graph
	12-04-2022	4.9 Simple problems in Signal flow graph for network

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		CLASS TEST 1
7th	18-04-2022	**Unit 5. Time Domain Analysis of Control Systems** 5.1 Definition of Time, Stability, steady-state response, accuracy, transient accuracy, in-sensitivity and robustness.
	19-04-2022	5.2 System Time Response
	21-04-2022	5.3 Analysis of Steady State Error
	22-04-2022	5.4 Types of Input & Steady state Error (Step)
8th	25-04-2022	5.4 Steady state Error (Ramp, Parabolic)
	26-04-2022	5.5 Parameters of first order system & second-order systems
	28-04-2022	5.6 Derivation of time response Specification (Delay time, Rise time, Peak time, Setting time, Peak over shoot)
	29-04-2022	**Unit 6. Feedback Characteristics of Control Systems** 6.1 Effect of parameter variation in open loop & closed loop systems.
9th	02-05-2022	6.2 Introduction to Basic control action & basic modes of feedback control (proportional, integral & derivative).
	05-05-2022	6.3 Effect of feedback on overall gain and stability.
	06-05-2022	6.4 Realisation of controller (P, PI) with OPAMP
10th	09-05-2022	6.4 Realisation of controller (PD, PID) with OPAMP
	10-05-2022	**1st Internal Assessment**
	12-05-2022	**Unit 7. Stability concept & Root locus Method** 7.1 Effect of location of poles on stability
	13-05-2022	7.2 Routh Hurwitz stability criterion
11th	17-05-2022	7.3 Steps for Root locus method
	19-05-2022	7.4 Root locus method of design (Simple problem)
	20-05-2022	7.4 Root locus method of design (Simple problem) **Class Test II**
12th	23-05-2022	**Unit 8. Frequency-response analysis &Bode Plot** 8.1 Frequency response, Relationship between time & frequency response 8.2 Methods of Frequency response
	24-05-2022	8.3 Polar plots & steps for polar plot, simple problems
	26-05-2022	8.4 Bodes plot & steps for Bode plots
	27-05-2022	8.4 Bodes plot & steps for Bode plots, simple problems

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13th	31-05-2022	8.5 Stability in frequency domain, Gain Margin & Phase margin
	02-06-2022	8.6 Nyquist plots. Nyquist stability criterion
	03-06-2022	8.7 Simple problems as above
14th	06-06-2022	**Unit 9. State variable Analysis** 9.1 Concepts of state, state variable, state model
	07-06-2022	9.2 State models for linear continuous time functions (simple)
	09-06-2022	**2nd Internal Assessment**
	10-06-2022	OVERALL REVISION

08/03/2022
Signature of Faculty

08/03/2022.
HOD (E&TC)

ACADEMIC COORDINATOR

Principal