

# KIIT POLYTECHNIC, BHUBANESWAR

## LESSON PLAN Session (2022-2023)

<b>Discipline:</b> Electronics & Telecommunication Engg.	<b>Semester:</b> 6 <sup>th</sup> , <b>Summer/2023</b>	<b>Name of the Faculty:</b> Mr Arun Kumar Gochhayat Lecturer <b>Email ID:</b> arun_gochhayatfet@kp.kiit.ac.in
<b>Subject:</b> Control Systems & Component, Theory-2	<b>No. of Days/week:</b> 04	<b>Start Date:</b> 13/02/2023 <b>End Date:</b> 23/05/2023

Week	Class Day	Theory Topics
1st	1st	Classification of Control system.
	2nd	Open loop system & Closed loop system and its comparison.
	3rd	Effects of Feedback.
	4th	Standard test Signals (Step, Ramp, Parabolic, and Impulse Functions).
2nd	1st	Servomechanism.
	2nd	Regulators ( Regulating systems)
	3rd	<b>Revision and Doubt clearing.</b>
	4th	Transfer Function of a system.
3rd	1st	Impulse response of a system.
	2nd	Properties, Advantages& Disadvantages of Transfer Function.
	3rd	Poles & Zeroes of transfer Function.
	4th	Representation of poles & Zero on the s-plane.
4th	1st	Simple problems of transfer function of network.

	2nd	<b>Doubt clearing and Class test.</b>
	3rd	Components of Control System.
	4th	Potentiometer.
5th	1st	Synchros.
	2nd	Diode modulator & demodulator.
	3rd	DC motors.
	4th	AC Servomotors.
6th	1st	Modelling of Electrical Systems(R, L, C, Analogous systems).
	2nd	<b>Revision and Doubt clearing.</b>
	3rd	Definition of Basic Elements of a Block Diagram.
	4th	Canonical Form of Closed loop Systems.
7th	1st	Rules for Block diagram Reduction part-I
	2nd	Rules for Block diagram Reduction part-II
	3rd	Procedure for of Reduction of Block Diagram.
	4th	Simple Problem for equivalent transfer function.
8th	1st	Basic Definition in SFG & properties.
	2nd	Mason's Gain formula.
	3rd	Steps for solving Signal flow Graph.
	4th	Simple problems in Signal flow graph for network.
9th	1st	<b>Doubt clearing and Class test.</b>
	2nd	Definition of Time, Stability, steady-state response, accuracy, transient accuracy, In-sensitivity and robustness.
	3rd	System Time Response.
	4th	Analysis of Steady State Error.
10th	1st	Types of Input & Steady state Error (Step, Ramp, Parabolic).
	2nd	Parameters of first order system & second-order systems.
	3rd	Derivation of time response Specification (Delay time, Rise time, Peak

		time, Setting time, Peak over shoot).
	4th	<b>Revision and Doubt clearing.</b>
11th	1st	Effect of parameter variation in Open loop System & Closed loop Systems.
	2nd	Introduction to Basic control Action& Basic modes of feedback control: proportional, integral and derivative.
	3rd	Effect of feedback on overall gain, Stability.
	4th	Realization of Controllers (P, PI, PD, PID) with OPAMP.
12th	1st	<b>Revision and Doubt clearing.</b>
	2nd	Effect of location of poles on stability.
	3rd	Routh-Hurwitz stability criterion.
	4th	Steps for Root locus method.
13th	1st	Root locus method of design (Simple problem).
	2nd	<b>Revision and Doubt clearing.</b>
	3rd	Frequency response, Relationship between time & frequency response.
	4th	Methods of Frequency response.
14th	1st	Polar plots & steps for polar plot.
	2nd	Bodes plot & steps for Bode plots.
	3rd	Stability in frequency domain, Gain Margin& Phase margin.
	4th	Nyquist plots. Nyquist stability criterion.
15th	1st	Simple problems as above.
	2nd	Concepts of state, state variable, state model.
	3rd	State models for linear continuous time functions (Simple).
	4th	<b>Doubt clearing and Class test.</b>

Signature of Concerned Faculty