

DHABALESWAR INSTITUTE OF POLYTECHNIC

LESSON PLAN

Discipline: ETC	Semester: 6th	Name of the Teaching Faculty Sibikanta Rath
Subject:	No. of days per week Class Allotted: 5	Semester from Dt. 14-02-23 to Dt. 23-05-23 No. of Weeks: 15 weeks
Week	Class Day	Theory / Practical Topics
Feb-14-23 1st week	1st day.	Unit:-1 Fundamentals of control system 1.1:- Classification of Control System.
	2nd day	1.2:- Open loop System & Closed loop System & its comparison.
	3rd day.	1.3:- Effects of Feedback
	4th day.	1.4:- Standard test Signals (Step, Ramp, Parabolic, Impulse functions)
2nd week	1st day	1.5 → Servomechanism.
	2nd day.	1.6 → Regulators (Regulating system)
	3rd day.	Unit:-2 Transfer function.
	4th day.	2.1:- Transfer function of a system & Impulse response.
3rd week	1st day	2.2:- Properties, Advantages & Disadvantages of transfer function.
	2nd day.	2.3:- Poles & Zeros of transfer function
	3rd day.	2.4:- Representation of poles & zeros on the s-plane.
	4th day.	2.5:- Simple problems of transfer function of networks.
4th week (March)	1st day	Unit:-3 Control System Components
	2nd day.	3.1 → Components of Control system
	3rd day.	3.2:- Potentiometer, Synchros, Diode modulator & demodulator.
	4th day.	3.3:- DC Motors, AC Servomotors
	5th day.	3.4:- Modelling of Electromechanical system (CR, R, C Analogous systems)

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5th week	1st day	Unit-4 Block Diagram & Signal Flow
	2nd day	Graphs (SFG)
	3rd day	4.1:- Definition of Basic Elements of a Block Diagram.
	4th day	4.2:- Canonical form of closed loop system.
6th week	1st day	4.3:- Rules for Block diagram Reduction
	2nd day	4.4:- Procedure for Reduction of Block Diagram.
	3rd day	4.5:- Simple Problem for equivalent transfer function.
	4th day	4.6:- Basic Definition in SFG & Properties.
7th week	1st day	4.7:- Mason's Gain formulae.
	2nd day	4.8:- Steps for solving signal flow
	3rd day	4.9:- Simple Problems in signal flow graph for network.
	4th day	
8th week (April)	1st day	Unit-5 Time Domain Analysis of Control System.
	2nd day	5.1:- Definition of Time Stability
	3rd day	steady-state response, accuracy, transient accuracy, Insensitivity and robustness.
	4th day	5.2:- System Time Response.
9th week	1st day	5.3:- Analysis of Steady State Error.
	2nd day	5.4:- Types of Input & Steady state Error (Step, Ramp, Parabolic)
	3rd day	5.5:- Parameters of first order system & Second order system.
	4th day	
	5th day	

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10th week	1st week	5.6:- Derivation of time response Specification (Delay time, Rise time, Peak time, Settling time, Peak overshoot).
	2nd week	
	3rd week	
	4th week	
11th week	1st week	6- Feedback Characteristics of control Systems. 6.1:- Effect of Parameter variation in open loop system & close loop systems. 6.2:- Introduction to Basic control Action & Basic modes of feedback control proportional, integral and derivative. 6.3:- Effect of feedback on overall gain, stability 6.4:- Realisation of controllers (P, PI, PD, PID) with OPAMP.
	2nd week	
	3rd week	
	4th week	
	5th week	
12th week (May)	1st day.	Unit:-7 Stability Concept & Root locus Method. 7.1:- Effect of location of poles on stability. 7.2:- Routh Hurwitz stability criterion. 7.3:- Steps for Root locus method 7.4:- Root locus method of design
	2nd day.	
	3rd day.	
	4th day.	
	5th day.	
13th week	1st day.	
	2nd day.	
	3rd day.	
	4th day.	
	5th day.	

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14 week.	1st day.	Unit 8 (Frequency-response analysis & Bode Plot)
	2nd day.	8.1:- Frequency response, Relationship between time & frequency response
	3rd day.	8.2:- Methods of frequency response
	4th day.	8.3:- Polar plots & steps for polar plots
	5th day.	8.4:- Bode plot & steps for Bode plot.
	6th day.	8.5:- Stability in frequency domain, Gain Margin & Phase margin
15-week (28 May)	1st day.	8.6:- Nyquist plots, Nyquist stability Criterion.
	2nd day.	8.7:- Simple problems as above.
	3rd day.	Unit 9:- State variable Analysis
		9.1:- Concepts of state, state variable, state model.
		9.2:- State models for linear continuous time functions