GOVT. POLYTECHNIC KANDHAMAL, (PHULBANI)
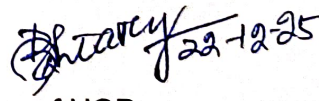
LESSON PLAN: CONTROL SYSTEM

6TH – SEMESTER, 2026 (S)

Discipline: Electrical Engineering	Semester: Summer 2026	Name of the teaching faculty: BICHITRANANDA PADHIARY, Lect.I (Electrical)		
Subject: CSE	No of days/per week class allotted: 05	Semester From Date:22.12.2025 To Date: 18.04.2026 No of weeks:16		
Week:	Class day:	Theory/practical topics:		
1ST	1ST	**Unit I (Fundamental of Control System)** Classification of Control system , Open loop system & Closed loop system and its comparison		
	2ND	Effects of Feed back		
	3RD	Standard test Signals(Step, Ramp, Parabolic, Impulse Functions)		
	4TH	Servomechanism		
	5TH	**Unit-II(Mechanical Model of System)** Transfer Function & Impulse response, Properties, Advantages & Disadvantages of Transfer Function		
2ND	1ST	Poles & Zeroes of transfer Function		
	2ND	Simple problems of transfer function of network.		
	3RD	Mathematical modeling of Electrical Systems(R, L, C, Analogous systems)		
	4TH	**Unit-III(Control System Componets)** Components of Control System		
	5TH	Gyroscope, Synchros		
3RD	1ST	Tachometer, DC servomotors, Ac Servomotors.		
	2ND	Revision of Control System Components		
	3RD	**CLASS TEST-I**		
	4TH	**Unit-IV(Block Diagram Algebra and Signal Flow Graph)** Definition: Basic Elements of Block Diagram ,Canonical Form of Closed loop Systems		
	5TH	Rules for Block diagram reduction		
4TH	1ST	Procedure for of Reduction of Block Diagram		
	2ND	Simple Problem for equivalent transfer function		
	3RD	Basic Definition in Signal Flow Graph & properties		
	4TH	Construction of Signal Flow graph from Block diagram		
	5TH	Mason's Gain formula		
5TH	1ST	Simple problems in Signal flow graph for network		
	2ND	**Unit-V (Time Response Analysis)** Time response of control system		

	3RD	Standard Test signal. 1. Step signal, 2. Ramp Signal	
	4TH	3. Parabolic Signal 4. Impulse Signal	
	5TH	Time Response of first order system with: 1. Unit step response 2. Unit impulse response	
6TH	1ST	Time response of second order system to the unit step input. 1. Time response specification. 2. Derivation of expression for rise time, peak time, peak overshoot, settling time and steady state error	
	2ND	3. Steady state error and error constants	
	3RD	Types of control system.[Steady state errors in Type-0, Type-1, Type-2 system]	
	4TH	Effect of adding poles and zero to transfer function.	
	5TH	Response with P, PI, PD and PID controller.	
7TH	1ST	Simple Numerical and Doubt Clearing Class	
	2ND	**Unit-VI(ANALYSIS OF STABILITY BY ROOT LOCUS TECHNIQUE.)** Root locus concept	
	3RD	Construction of root loci.	
	4TH	Construction of root loci and numerical	
	5TH	Numerical on construction of root locus	
8TH	1ST	Rules for construction of the root locus.	
	2ND	Numerical on root locus	
	3RD	Numerical on root locus	
	4TH	Effect of adding poles and zeros to G(s) and H(s).	
	5TH	Numerical on Poles and Zeros	
9TH	1ST	Revision and Simple numerical.	
	2ND	**Unit-VII(FREQUENCY RESPONSE ANALYSIS.)** Correlation between time response and frequency response	
	3RD	Polar plots	
	4TH	Numerical on Polar Plots	
	5TH	Bode plots.	
10TH	1ST	Simple numerical on Bode Plots	
	2ND	All pass and minimum phase system	
	3RD	Computation of Gain margin and phase margin	
	4TH	Numerical on Phase margin and gain margin	
	5TH	Log magnitude versus phase plot.	
11TH	1ST	Closed loop frequency response	
	2ND	**Unit-VIII(NYQUIST PLOT)** Principle of argument	
	3RD	Nyquist stability criterion	
	4TH	Nyquist stability criterion applied to inverse polar plot.	

		5TH	Simple Numerical on Nyquist Criterion.
12TH		1ST	Effect of addition of poles and zeros to G(S) H(S) on the shape of Niquist plot.
		2ND	Methods of Starting of Synchronous Motor
		3RD	Assessment of relative stability
		4TH	Constant M and N circle
		5TH	Nicholas chart.
13TH		1ST	Simple numerical and Revision.
		2ND	**CLASS TEST-II**
		3RD	Short Revision and doubt clearing class of Unit-I
		4TH	Short Revision and doubt clearing class of Unit-II
		5TH	Short Revision and doubt clearing class of Unit-III
14TH		1ST	Short Revision and doubt clearing class of Unit-IV
		2ND	Short Revision and doubt clearing class of Unit-V
		3RD	Short Revision and doubt clearing class of Unit-VI
		4TH	Short Revision and doubt clearing class of Unit-VII
		5TH	Short Revision and doubt clearing class of Unit-VIII
15TH		1ST	Previous Year Question Discussion
		2ND	Previous Year Question Discussion
		3RD	Previous Year Question Discussion
		4TH	Previous Year Question Discussion
		5TH	Previous Year Question Discussion
16TH		1ST	Previous Year Question Discussion
		2ND	Previous Year Question Discussion
		3RD	Previous Year Question Discussion
		4TH	Previous Year Question Discussion
		5TH	Previous Year Question Discussion

Bhitarey 22-12-25

Sign. of Faculty Concerned

Bhitarey 22-12-25

Sign. of HOD