Discipline:	Semester:6TH	Name of the Teaching Faculty: PALLABI MOHANTA
Subject: CONTROL SYSTEM ENGG(Th.3)	No. of Days/per week class allotted:	Semester From Date: 14.02.2023 To Date:23.05.2023 No. of Weeks; 15
Week	Class Day	Theory/Practical Topics
1st	01	FUNDAMENTAL OF CONTROL SYSTEM 1.1. Classification of Control system.
	02	1.2. Open loop system & Closed loop system and its comparison
	03	1.3. Effects of Feed back 1.4. Standard test Signals(Step, Ramp, Parabolic, Impulse Functions)
	04	1.5. Servomechanism
	05	Tutorial Class
2nd	01	MATHEMATICAL MODEL OF A SYSTEM 2.1. Transfer Function & Impulse response
	02	2.2. Properties, Advantages & Disadvantages of Transfer Function 2.3. Poles & Zeroes of transfer Function
	03	2.4. Simple problems of transfer function of network.
	04	2.5. Mathematical modeling of Electrical Systems(R, L, C, Analogous systems)
	05	Tutorial Class
3rd	01	CONTROL SYSTEM COMPONENTS 3.1. Components of Control System
	02	3.2Gyroscope, Synchros
	03	Tachometer, DC servomotors
	04	Ac Servomotors.
	05	Tutorial Class
4th	01	BLOCK DIAGRAM ALGEBRA & SIGNAL FLOW GRAPHS 4.1. Definition: Basic Elements of Block Diagram
	02	4.2. Canonical Form of Closed loop Systems
	03	4.3. Rules for Block diagram reduction
	04	4.4. Procedure for of Reduction of Block Diagram
	05	Tutorial Class
5th	01	4.5. Simple Problem for equivalent transfer function
	02	4.6. Basic Definition in Signal Flow Graph & properties
	03	4.7. Construction of Signal Flow graph from Block diagram
	04	4.8. Mason's Gain formula 4.9. Simple problems in Signal flow graph for network
	05	Tutorial Class
6th	01	TIME RESPONSE ANALYSIS. 5 . 1 Time response of control system
	02	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
	03	5 . 3 Time Response of first order system with: 5.3.1. Unit step response

	04	5.3.2. Unit impulse response
	05	Tutorial Class
7th	01	5 . 4 Time response of second order system to the unit step input. 5.4.1. Time response specification.
	02	5.4.2. Derivation of expression for rise time, peak time, peak overshoot, settling time and steady state error.
	03	5.4.3. Steady state error and error constants
	04	5 . 5 Types of control system.[Steady state errors in Type-0, Type-1, Type-2 system]
	05	Tutorial Class
8th	01	5 . 6 Effect of adding poles and zero to transfer function
	02	5 . 7 Response with P, PI, PD and PID controller
	03	ANALYSIS OF STABILITY BY ROOT LOCUS TECHNIQUE. 6 . 1 Root locus concept
	04	6 . 2 Construction of root loci
	05	Tutorial Class
9th	01	6 . 3 Rules for construction of the root locus
	02	6 . 3 Rules for construction of the root locus
	03	6 . 3 Rules for construction of the root locus
	04	6 . 3 Rules for construction of the root locus
	05	Tutorial Class
10th	01	6 . 3 Rules for construction of the root locus
	02	6 . 3 Rules for construction of the root locus
	03	6 . 4 Effect of adding poles and zeros to G(s) and H(s)
	04	6 . 4 Effect of adding poles and zeros to G(s) and H(s)
	05	Tutorial Class
11th	01	FREQUENCY RESPONSE ANALYSIS. 7 . 1 Correlation between time response and frequency response.
	02	7 . 2 Polar plots.
	03	7 . 2 Polar plots.
	04	7 . 2 Polar plots.
	05	Tutorial Class
12th	01	7 . 3 Bode plots.
	02	7 . 3 Bode plots.
	03	7 . 4 All pass and minimum phase system.
	04	7 . 5 Computation of Gain margin and phase margin
	05	Tutorial Class
13th	01	7 . 6 Log magnitude versus phase plot.
	02	7 . 7 Closed loop frequency response.
	03	NYQUIST PLOT 8.1 Principle of argument
	04	8.2 Nyquist stability criterion

	05	Tutorial Class
14th	01	8.2 Nyquist stability criterion
	02	8.2 Nyquist stability criterion
	03	8.3 Niquist stability criterion applied to inverse polar plot
	04	8.4 Effect of addition of poles and zeros to G(S) H(S) on the shape of Niquist plot
	05	Tutorial Class
15th	01	8.5 Assessment of relative stability
	02	8.6 Constant M and N circle
	03	8.6 Constant M and N circle
	04	8.7 Nicholas chart.
	05	Tutorial Class