NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)

LESSON PLAN

SUBJECT: Th-3 (CONTROL SYSTEM ENGG.)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actualy needed
1	FUNDAMENTAL OF CONTROL SYSTEM	4	8
2	MATHEMATICAL MODEL OFSYSTEM	4	9
3	CONTROL SYSTEM COMPONENTS	4	4
4	BLOCK DIAGRAM ALGEBRA AND SIGNAL FLOW GRAPHS	8	11
5	TIME RESPONSE ANALYSIS	10	16
6	ANALYSIS OF STABILITY BY ROOT LOCUS TECHNIQU	10	7
7	FREQUENCY RESPONSE OF A SYSTEM	10	10
8	NYQUIST PLOT	10	10
	TOTAL:	60	75

Discipline: ELECTRICAL ENGG.	**Semester:** 6TH	**Name of the Teaching Faculty:** Er. Soumyajit Rout
WEEK	**CLASS DAY**	**TOPIC**
1st	1	1.1. Classification of Control system
	2	1.2. Open loop system & Closed loop system and its comparison
	3	1.3. Effects of Feedback
	4	1.4. Standard test Signals(Step, Ramp, Parabolic, Impulse Functions)
	5	TUTORIAL
2nd	1	1.4. Standard test Signals(Step, Ramp, Parabolic, Impulse Functions)
	2	1.5. Servomechanism
	3	1.5. Servomechanism
	4	2.1. Transfer Function & Impulse response,
	5	TUTORIAL
3rd	1	2.2. Properties, Advantages & Disadvantages of Transfer Function
	2	2.3. Poles & Zeroes of transfer Function
	3	2.4. Simple problems of transfer function of network.
	4	2.4. Simple problems of transfer function of network.
	5	TUTORIAL

4th	1	2.5. Mathematical modeling of Electrical Systems (R, L, C, Analogous systems)
	2	2.5. Mathematical modeling of Electrical Systems (R, L, C, Analogous systems)
	3	3.1. Components of Control System
	4	3.2. Gyroscope, Synchros, Tachometer, DC servomotors, Ac Servomotors
	5	TUTORIAL
5th	1	CLASS TEST
	2	4.1. Definition: Basic Elements of Block Diagram
	3	4.2. Canonical Form of Closed loop Systems
	4	4.3. Rules for Block diagram reduction
	5	TUTORIAL
6th	1	4.4. Procedure for of Reduction of Block Diagram
	2	4.5. Simple Problem for equivalent transfer function
	3	4.6. Basic Definition in Signal Flow Graph & properties
	4	4.7. Construction of Signal Flow graph from Block diagram
	5	TUTORIAL

7th	1	4.8.Mason's Gain formula
	2	4.9. Simple problems in Signal flow graph for network
	3	5.1Time response of control system.
	4	5. 2 Standard Test signal.5.2.1. Step signal,
	5	TUTORIAL
8th	1	5.2.2.Ramp Signal
	2	5.2.3.Parabolic Signal
	3	5.2.4.Impulse Signal
	4	5.3Time Response of first order system with: 53.1.Unit step response
	5	TUTORIAL
9th	1	5.3.2.Unit impulse response.
	2	5.4Time response of second order system to the unit step input.5.4.1.Time response specification.
	3	5.4.2.Derivation of expression for rise time,peak time,peak overshoot, settling time and steady state error.
	4	5.4.3. Steady state error and error constants.
	5	TUTORIAL

10th	1	5.5Types of control system.[Steady state errors in Type 0, - Type-1, Type-2 system]
	2	5. 6 Effect of adding poles and zero to transfer function .
	3	5. 7 Response with P, PI, PD and PID controller.
	4	6.1Root locus concept.
	5	TUTORIAL
11th	1	6. 2 Construction of root loci.
	2	6.3Rules for construction of the root locus.
	3	6. 4 Effect of adding poles and zeros to G(s) and H(s).
	4	7.1 Correlation between time response and frequency response.
	5	TUTORIAL
12th	1	7.2Polar plots.
	2	7.2Polar plots.
	3	7.3Bode plots.
	4	7.3Bode plots.
	5	TUTORIAL

13th	1	7.4 All pass and minimum phase system.
	2	7. 5 Computation of Gain margin and phase margin.
	3	7.6 Log magnitude versus phase plot .
	4	7. 7 Closed loop frequency response.
	5	TUTORIAL
14th	1	8.1 Principle of argument.
	2	8.2 Nyquist stability criterion.
	3	8.3 Niquist stability criterion applied to inverse polar plot
	4	8.4 Effect of addition of poles and zeros to G(S)H(S) on the shape of Niquist plot.
	5	TUTORIAL
15th	1	8.5 Assessment of relative stability.
	2	8.6 Constant M and N circle
	3	8.6 Constant M and N circle
	4	8.7 Nicholas chart.
	5	CLASS TEST