BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

ELECTRICAL ENGG.DEPARTMENT

LESSON PLAN

SEMESTER: 6TH (B)

SESSION – SUMMER (2022-23)

SUBJECT: CONTROL SYSTEM ENGG

NAME OF FACULTY: Mrs. IPSITA MOHANTY

BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

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LESSON PLAN

SEMESTER: 6TH (B)

SESSION – SUMMER (2022-23)

SUBJECT: CONTROL SYSTEM ENGG

NAME OF FACULTY: Mrs. IPSITA MOHANTY

Discipline: **Electrical Engg.**	Semester:**6Th (B)**	Name of the teaching faculty: **IPSITA MOHANTY**
Subject-**CONTROL SYSTEM**	No. of Days/per week class allotted: **05 PERIODS /WEEK (MON-2,TUE-1,WED-2 PERIOD)**	Semester: From Date: **14/02/2023** To Date: **23/05/2023** No. of weeks: **14 WEEKS**
Week	**Class Day**	**Theory/Practical Topics**
1st (14/02/2023-18/02/2023)	14/02/2023	**1. FUNDAMENTAL OF CONTROL SYSTEM** 1.1. Classification of Control system 1.2. Open loop system & Closed loop system and its comparison
	15/02/2023	1.3. Effects of Feed back
	15/02/2023	1.4. Standard test Signals(Step, Ramp, Parabolic, Impulse Functions)
2nd (20/02/2023-25/02/2023)	20/02/2023	1.5. Servomechanism
	20/02/2023	**2. MATHEMATICAL MODEL OF A SYSTEM** 2.1. Transfer Function & Impulse response, 2.2. Properties, Advantages & Disadvantages of Transfer Function
	21/02/2023	2.3. Poles & Zeroes of transfer Function

	22/02/2023	2.4. Simple problems of transfer function of network.
	22/02/2023	2.4. Simple problems of transfer function of network.
3rd (27/02/2023-04/03/2023)	27/02/2023	2.4. Simple problems of transfer function of network.
	27/02/2023	2.5. Mathematical modeling of Electrical Systems(R, L, C, Analogous systems)
	28/02/2023	2.5. Mathematical modeling of Electrical Systems(R, L, C, Analogous systems)
	01/03/2023	**3. CONTROL SYSTEM COMPONENTS** 3.1. Components of Control System
	01/03/2023	3.2. Gyroscope, Synchros, Tachometer, DC servomotors, Ac Servomotors
4th (06/03/2023-11/03/2023)	06/03/2023	3.2. Gyroscope, Synchros, Tachometer, DC servomotors, Ac Servomotors
	06/03/2023	**4. BLOCK DIAGRAM ALGEBRA & SIGNAL FLOW GRAPHS** 4.1. Definition: Basic Elements of Block Diagram
	07/03/2023	**DOLA PURNIMA....**
	08/03/2023	HOLI
	08/03/2023	HOLI
5TH (13/03/2023-18/03/2023)	13/03/2023	**CLASS TEST 1**
	13/03/2023	4.2. Canonical Form of Closed loop Systems 4.3. Rules for Block diagram reduction
	14/03/2023	4.4. Procedure for of Reduction of Block Diagram
	15/03/2023	4.5. Simple Problem for equivalent transfer function
	15/03/2023	4.6. Basic Definition in Signal Flow Graph & properties

6TH (20/03/2023-25/03/2023)	20/03/2023	4.7. Construction of Signal Flow graph from Block diagram
	20/03/2023	4.8. Mason's Gain formula
	21/03/2023	4.9. Simple problems in Signal flow graph for network
	22/03/2023	**5. TIME RESPONSE ANALYSIS.** 5. 1 Time response of control system.
	22/03/2023	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
7th (27/03/2023-01/04/2023)	27/03/2023	5. 3 Time Response of first order system with: 5.3.1. Unit step response
	27/03/2023	5.3.2. Unit impulse response.
	28/03/2023	5. 4 Time response of second order system to the unit step input.
	29/03/2023	5.4.1. Time response specification.
	29/03/2023	5.4.2. Derivation of expression for rise time
8th (03/04/2023-08/04/2023)	03/04/2023	5.4.2. Derivation of expression for rise time
	03/04/2023	5.4.2. Derivation of expression for rise time
	04/04/2023	5.4.2. Derivation of expression for rise time, peak time, peak overshoot, settling time and steady state error.
	05/04/2023	5.4.3. Steady state error and error constants.
	05/04/2023	5. 5 Types of control system.[Steady state errors in Type-0, Type-1, Type-2 system] .
9th (10/04/2023-15/04/2023)	10/04/2023	5.4.2. Derivation of expression for rise time, peak time, peak overshoot, settling time and steady state error.

	10/04/2023	5. 6 Effect of adding poles and zero to transfer function
	11/04/2023	**CLASS TEST 2**
	12/04/2023	5. 7 Response with P, PI, PD and PID controller.
	12/04/2023	**6. ANALYSIS OF STABILITY BY ROOT LOCUS TECHNIQUE.** 6. 1 Root locus concept.
10th (17/04/2023-22/04/2023)	17/04/2023	6. 2 Construction of root loci.
	17/04/2023	6. 3 Rules for construction of the root locus.
	18/04/2023	6. 3 Rules for construction of the root locus.
	19/04/2023	6. 3 Rules for construction of the root locus.
	19/04/2023	6. 3 Rules for construction of the root locus.
11th (24/04/2023-29/04/2023)	24/04/2023	6. 3 Rules for construction of the root locus.
	24/04/2023	6. 4 Effect of adding poles and zeros to G(s) and H(s).
	25/04/2023	**FREQUENCY RESPONSE ANALYSIS.** 7. 1 Correlation between time response and frequency response. 7. 2 Polar plots.
	26/04/2023	**INTERNAL ASSESSMENT**
	26/04/2023	**INTERNAL ASSESSMENT**
12th (01/05/2023-06/05/2023)	01/05/2023	**FREQUENCY RESPONSE ANALYSIS.** 7. 1 Correlation between time response and frequency response. 7. 2 Polar plots.
	01/05/2023	7. 3 Bode plots.

	02/05/2023	7. 3 Bode plots.
	03/05/2023	7. 3 Bode plots.
	03/05/2023	7. 3 Bode plots.
13th (08/05/2023-13/05/2023)	08/05/2023	7. 4 All pass and minimum phase system.
	08/05/2023	7. 5 Computation of Gain margin and phase margin.
	09/05/2023	7. 6 Log magnitude versus phase plot. 7. 7 Closed loop frequency response
	10/05/2023	**8. NYQUIST PLOT**
	10/05/2023	8.1 Principle of argument.
14th (15/05/2023-20/05/2023)	15/05/2023	8.2 Nyquist stability criterion.
	15/05/2023	8.3 Niquist stability criterion applied to inverse polar plot.
	16/05/2023	8.2 Nyquist stability criterion.
	17/05/2023	8.3 Niquist stability criterion applied to inverse polar plot.
	17/05/2023	8.4 Effect of addition of poles and zeros to G(S) H(S) on the shape of Niquist plot.
15th (22/05/2023-25/05/2023)	22/05/2023	8.5 Assessment of relative stability. 8.6 Constant M and N circle
	22/05/2023	8.7 Nicholas chart.
	23/05/2023	REVISION

BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

ELECTRICAL ENGG.DEPARTMENT

LESSON PLAN

SEMESTER: 4TH (A)

SESSION – SUMMER (**2022-23**)

SUBJECT: ANALOG ELECTRONICS & OPAMP

NAME OF FACULTY: Mrs. IPSITA MOHANTY

Discipline: **Electrical Engg.**	Semester:**4TH (A)**	Name of the teaching faculty: **Mrs. IPSITA MOHANTY**
Subject-**ANALOG ELECTRONICS & OPAMP**	No. of Days/per week class allotted: **04 PERIODS /WEEK** **(MON -1, WED -1, THUR -1, FRI-1 PERIOD EACH)**	Semester: From Date: **14/02/2023** To Date: **23/05/2023** No. of weeks: **15 WEEKS**
Week	**Class Day**	**Theory/Practical Topics**
1ST (14/02/2023-18/02/2023)	15/02/2023	**1. P-N JUNCTION DIODE:** 1 . 1 P-N Junction Diode
	16/02/2023	1 . 2 Working of Diode 1 . 3 V-I characteristic of PN junction Diode.
	17/02/2023	1 . 4 DC load line 1 . 5 Important terms such as Ideal Diode, Knee voltage
	18/02/2023	**MAHA SHIVARATRI.....**
2nd (20/02/2023-25/02/2023)	20/02/2023	1 . 6 Junctions break down. 1.6.1 Zener breakdown 1.6.2 Avalanche breakdown
	22/02/2023	1 . 7 P-N Diode clipping Circuit.
	23/02/2023	1 . 8 P-N Diode clamping Circuit
	24/02/2023	**2.SPECIAL SEMICONDUCTOR DEVICES:** 2 . 1 Thermistors, Sensors &barretters
3rd (25/02/2023-04/03/2023)	27/02/2023	2. 2 Zener Diode
	01/03/2023	2 . 3 Tunnel Diode
	02/03/2023	2 . 4 PIN Diode
	03/03/2023	**3.RECTIFIER CIRCUITS & FILTERS:** 3.1 Classification of rectifiers

4th (06/03/2023-11/03/2023)	06/03/2023	3.2 Analysis of half wave, full wave centre tapped and Bridge rectifiers and calculate
	08/03/2023	**HOLI....**
	09/03/2023	Analysis of half wave, full wave centre tapped and Bridge rectifiers and calculate 3.2.1 DC output current and voltage 3.2.2 RMS output current and voltage 3.2.3 Rectifier efficiency
	10/03/2023	**CLASS TEST 1**
5TH (13/03/2023-18/03/2023)	13/03/2023	3.2.2 RMS output current and voltage
	15/03/2023	3.2.3 Rectifier efficiency
	16/03/2023	3.2.4 Ripple factor
	17/03/2023	3.2.5 Regulation 3.2.6 Transformer utilization factor 3.2.7 Peak inverse voltage
6TH (20/03/2023-25/03/2023)	20/03/2023	3.3Filters: 3.3.1 Shunt capacitor filter 3.3.2 Choke input filter 3.3.3 π filter
	22/03/2023	**4.TRANSISTOR** 4.1 Principle of Bipolar junction transistor
	23/03/2023	4.2 Different modes of operation of transistor
	24/03/2023	4.3 Current components in a transistor
7th (27/03/2023-01/04/2023)	27/03/2023	4.4 Transistor as an amplifier
	29/03/2023	4.5Transistor circuit configuration & its characteristics 4.5.1 CB Configuration
	30/03/2023	4.5.2 CE Configuration
	31/03/2023	4.5.3 CC Configuration

8th (03/04/2023-08/04/2023)	03/04/2023	**5. TRANSISTOR CIRCUITS:** 5.1 Transistor biasing
	05/04/2023	5.2 Stabilization
	06/04/2023	5.3 Stability factor
	07/04/2023	5.4 Different method of Transistors Biasing 5.4.1 Base resistor method
9th (10/04/2023-15/04/2023)	10/04/2023	5.4 Different method of Transistors Biasing 5.4.1 Base resistor method
	12/04/2023	**CLASS TEST 2**
	13/04/2023	5.4 Different method of Transistors Biasing 5.4.1 Base resistor method
	14/04/2023	5.4.2 Collector to base bias
10th (17/04/2023-22/04/2023)	17/04/2023	**6. TRANSISTOR AMPLIFIERS & OSCILLATORS:** 6.1 Practical circuit of transistor amplifier
	19/04/2023	6.2 DC load line and DC equivalent circuit
	20/04/2023	6.3 AC load line and AC equivalent circuit 6.4 Calculation of gain
	21/04/2023	6.5 Phase reversal 6.6 H-parameters of transistors 6.7 Simplified H-parameters of transistors
11th (24/04/2023-29/04/2023)	24/04/2023	6.8 Generalised approximate model 6.9 Analysis of CB, CE, CC amplifier using generalised approximate mode
	26/04/2023	**INTERNAL ASSESSMENT**
	27/04/2023	**INTERNAL ASSESSMENT**
	28/04/2023	6.10 Multi stage transistor amplifier 6.10.1 R.C. coupled amplifier 6.10.2 Transformer coupled amplifier
12th (01/05/2023-06/05/2023)	01/05/2023	6.11 Feed back in amplifier 6.11.1 General theory of feed back 6.11.2 Negative feedback circuit
	03/05/2023	6.11.3 Advantage of negative feed back 6.12 Power amplifier and its classification 6.12.1 Difference between voltage amplifier and power amplifier

	04/05/2023	. **FIELD EFFECT TRANSISTOR:** 7.1 Classification of FET 7.2 Advantages of FET over BJT 7.3 Principle of operation of BJT
	05/05/2023	7.4 FET parameters (no mathematical derivation) 7.4.1 DC drain resistance 7.4.2 AC drain resistance 7.4.3 Trans-conductance 7.5 Biasing of FET
13th (08/05/2023-13/05/2023)	08/05/2023	**8. OPERATIONAL AMPLIFIERS:** 8.1 General circuit simple of OP-AMP and IC – CA – 741 OP AMP 8.2 Operational amplifier stages
	10/05/2023	**QUIZ TEST**
	11/05/2023	8.3 Equivalent circuit of operational amplifier
	12/05/2023	8.4 Open loop OP-AMP configuration 8.5 OPAMP with fed back 8.6 Inverting OP-AMP
14th (15/05/2023-20/05/2023)	15/05/2023	8.7 Non inverting OP-AMP 8.8 Voltage follower & buffer
	17/05/2023	8.9 Differential amplifier 8.9.1 Adder or summing amplifier
	18/05/2023	8.9.2 Sub tractor 8.9.3 Integrator
	19/05/2023	8.9.4 Differentiator 8.9.5 Comparator
15th (15/05/2023-20/05/2023)	22/05/2023	**REVISION**