BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

ELECTRICAL ENGG.DEPARTMENT

LESSON PLAN

SEMESTER: 6TH (A)

SESSION – SUMMER (2021-22)

SUBJECT: CONTROL SYSTEM

NAME OF FACULTY: Mrs IPSITA MOHANTY

Discipline: **Electrical Engg.**	Semester:**6Th (A)**	Name of the teaching faculty: IPSITA MOHANTY
Subject-**CONTROL SYSTEM**	No. of Days/per week class allotted: **05 PERIODS /WEEK (MON-1,TUE-1,WED-2,SAT-1 5 PERIOD)**	Semester: From Date: **10/03/2022** To Date: **10/06/2022** No. of weeks: **14 WEEKS**
Week	**Class Day**	**Theory/Practical Topics**
1st (10/03/2022-12/03/2022)	12/03/2022	**1. FUNDAMENTAL OF CONTROL SYSTEM** 1.1. Classification of Control system 1.2. Open loop system & Closed loop system and its comparison
2nd (14/03/2022-19/03/2022)	14/03/2022	1.3. Effects of Feed back
	15/03/2022	1.4. Standard test Signals(Step, Ramp, Parabolic, Impulse Functions)
	16/03/2022	1.5. Servomechanism
	16/03/2022	**2. MATHEMATICAL MODEL OF A SYSTEM** 2.1. Transfer Function & Impulse response,
	18/03/2022	**Dola Purnima**
	19/03/2022	**Holi**
3rd (21/03/2022-26/03/2022)	21/03/2022	2.2. Properties, Advantages & Disadvantages of Transfer Function 2.3. Poles & Zeroes of transfer Function
	22/03/2022	2.4. Simple problems of transfer function of network.
	23/03/2022	2.5. Mathematical modeling of Electrical Systems(R, L, C, Analogous systems)

	23/03/2022	**3. CONTROL SYSTEM COMPONENTS** 3.1. Components of Control System
	26/03/2022	3.1. Components of Control System
4th (28/03/2022-02/04/2022)	28/03/2022	3.2. Gyroscope, Synchros, Tachometer, DC servomotors, Ac Servomotors
	29/03/2022	3.2. Gyroscope, Synchros, Tachometer, DC servomotors, Ac Servomotors
	30/03/2022	**4. BLOCK DIAGRAM ALGEBRA & SIGNAL FLOW GRAPHS** 4.1. Definition: Basic Elements of Block Diagram
	30/03/2022	4.2. Canonical Form of Closed loop Systems
	01/04/2022	**UTKAL DIVAS**
	02/04/2022	4.3. Rules for Block diagram reduction
5TH (04/04/2022-09/04/2022)	04/04/2022	4.4. Procedure for of Reduction of Block Diagram
	05/04/2022	4.5. Simple Problem for equivalent transfer function
	06/04/2022	4.6. Basic Definition in Signal Flow Graph & properties
	06/04/2022	4.7. Construction of Signal Flow graph from Block diagram
	09/04/2022	4.8. Mason's Gain formula
6TH (11/04/2022-16/04/2022)	11/04/2022	4.9. Simple problems in Signal flow graph for network
	12/04/2022	**CLASS TEST**
	13/04/2022	Problem solving class
	13/04/2022	**5. TIME RESPONSE ANALYSIS.** 5. 1 Time response of control system.
	14/04/2022	**AMBEDKAR JAYANTI**
	15/04/2022	**GOOD FRIDAY**
	16/04/2022	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 (18/04/2022-23/04/2022)	18/04/2022	5. 3 Time Response of first order system with: 5.3.1. Unit step response
	19/04/2022	5.3.2. Unit impulse response.
	20/04/2022	5. 4 Time response of second order system to the unit step input.
	20/04/2022	5.4.1. Time response specification.
	23/04/2022	5.4.2. Derivation of expression for rise time, peak time, peak overshoot, settling time and steady state error.
8th (25/04/2022-30/04/2022)	25/04/2022	5.4.3. Steady state error and error constants.
	26/04/2022	5. 5 Types of control system.[Steady state errors in Type-0, Type-1, Type-2 system]
	27/04/2022	5. 6 Effect of adding poles and zero to transfer function.
	27/04/2022	5. 7 Response with P, PI, PD and PID controller.
	30/04/2022	**6. ANALYSIS OF STABILITY BY ROOT LOCUS TECHNIQUE.** 6. 1 Root locus concept.
9th (01/05/2022-07/05/2022)	02/05/2022	6. 2 Construction of root loci.
	03/05/2022	**ID-UL-FITRE**
	04/05/2022	6. 3 Rules for construction of the root locus.
	04/05/2022	6. 3 Rules for construction of the root locus.
	07/05/2022	**CLASS TEST**
10th (09/05/2022-14/05/2022)	09/05/2022	6. 3 Rules for construction of the root locus.
	10/05/2022	6. 3 Rules for construction of the root locus.
	11/05/2022	6. 3 Rules for construction of the root locus.

	11/05/2022	6. 3 Rules for construction of the root locus.
	12/05/2022	**INTERNAL ASSESSMENT**
	13/05/2022	**INTERNAL ASSESSMENT**
	14/05/2022	6. 4 Effect of adding poles and zeros to G(s) and H(s).
11th (16/05/2022-21/05/2022)	**16/05/2022**	**BUDDHA PURNIMA**
	17/05/2022	**FREQUENCY RESPONSE ANALYSIS.** 7. 1 Correlation between time response and frequency response.
	18/05/2022	7. 2 Polar plots.
	18/05/2022	7. 2 Polar plots.
	21/05/2022	7. 3 Bode plots.
12th (23/05/2022-28/05/2022)	23/05/2022	7. 3 Bode plots.
	24/05/2022	7. 3 Bode plots.
	25/05/2022	7. 4 All pass and minimum phase system.
	25/05/2022	7. 5 Computation of Gain margin and phase margin.
	28/05/2022	7. 6 Log magnitude versus phase plot. 7. 7 Closed loop frequency response.
13th (30/05/2022-04/06/2022)	**30/05/2022**	**SABITRI AMABASYA**
	31/05/2022	**8. NYQUIST PLOT** 8.1 Principle of argument.
	01/06/2022	8.2 Nyquist stability criterion.
	01/06/2022	8.3 Niquist stability criterion applied to inverse polar plot. 8.4 Effect of addition of poles and zeros to G(S) H(S) on the shape of Niquist plot
	04/06/2022	8.4 Effect of addition of poles and zeros to G(S) H(S) on the shape of Niquist plot.

14th (06/06/2022-10/06/2022)	**06/06/2022**	**CLASS TEST**
	07/06/2022	8.6 Constant M and N circle 8.7 Nicholas chart.
	08/06/2022	**REVISION**
	08/06/2022	**REVISION**

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ELECTRICAL ENGG.DEPARTMENT

LESSON PLAN

SEMESTER: 4^{TH} (A)

SESSION – SUMMER (2021-22)

SUBJECT: ANALOG ELECTRONICS & OPAMP

NAME OF FACULTY: Mrs IPSITA MOHANTY

Discipline: **ELECTRICAL ENGG.**	Semester:4Th	Name of the teaching faculty:IPSITA MOHANTY
Subject:**ANALOG ELECTRONICS AND OPAMP**	No. of Days/per week class allotted: **04 PERIODS /WEEK (MON-2,THU-1,FRI-1 4 PERIOD)**	Semester: From Date: **10/03/2022** To Date: **10/06/2022** No. of weeks: **14 WEEKS**
Week	**Class Day**	**Theory/Practical Topics**
1st (10/03/2022-12/03/2022)	10/03/2022	**1.P-N JUNCTION DIODE:** 1 . 1 P-N Junction Diode 1 . 2 Working of Diode
2nd (14/03/2022-19/03/2022)	14/03/2022	1 . 3 V-I characteristic of PN junction Diode.
	14/03/2022	1 . 4 DC load line 1 . 5 Important terms such as Ideal Diode, Knee voltage 1 . 6 Junctions break down. 1.6.1 Zener breakdown 1.6.2 Avalanche breakdown
	17/03/2022	1 . 7 P-N Diode clipping Circuit.
	18/03/2022	**Dola Purnima**
	19/03/2022	**Holi**
3rd (21/03/2022-26/03/2022)	21/03/2022	1 . 8 P-N Diode clamping Circuit
	21/03/2022	**2.SPECIAL SEMICONDUCTOR DEVICES:** 2 . 1 Thermistors, Sensors & barretters
	24/03/2022	2 . 2 Zener Diode
	25/03/2022	2 . 3 Tunnel Diode 2 . 4 PIN Diode
4th (28/03/2022-02/04/2022)	28/03/2022	**3.RECTIFIER CIRCUITS & FILTERS:** 3.1 Classification of rectifiers

		3.2 Analysis of half wave calculate: 3.2.1 DC output current and voltage
	28/03/2022	3.2.2 RMS output current and voltage 3.2.3 Rectifier efficiency 3.2.4 Ripple factor 3.2.5 Regulation 3.2.6 Transformer utilization factor 3.2.7 Peak inverse voltage
	31/03/2022	3.2 Analysis of 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
	01/04/2022	**UTKAL DIVAS**
5TH (04/04/2022-09/04/2022)	04/04/2022	3.2.4 Ripple factor 3.2.5 Regulation 3.2.6 Transformer utilization factor 3.2.7 Peak inverse voltage
	04/04/2022	3.3 Filters: 3.3.1 Shunt capacitor filter 3.3.2 Choke input filter 3.3.3 π filter
	07/04/2022	**4.TRANSISTORS:** 4.1 Principle of Bipolar junction transistor
	08/04/2022	4.2 Different modes of operation of transistor 4.3 Current components in a transistor
6TH (11/04/2022-16/04/2022)	11/04/2022	4.4 Transistor as an amplifier
	11/04/2022	**CLASS TEST**
	14/04/2022	**AMBEDKAR JAYANTI**
	15/04/2022	**GOOD FRIDAY**
7th (18/04/2022-23/04/2022)	18/04/2022	4.5 Transistor circuit configuration & its characteristics 4.5.1 CB Configuration

		4.5.2 CE Configuration 4.5.3 CC Configuration
	18/04/2022	**5.TRANSISTOR CIRCUITS:** 5.1 Transistor biasing
	21/04/2022	5.2 Stabilization 5.3 Stability factor
	22/04/2022	5.4 Different method of Transistors Biasing 5.4.1 Base resistor method
8th (25/04/2022-30/04/2022)	25/04/2022	5.4.2 Collector to base bias 5.4.3 Self bias or voltage divider method
	25/04/2022	**6.TRANSISTOR AMPLIFIERS & OSCILLATORS:** 6.1 Practical circuit of transistor amplifier 6.2 DC load line and DC equivalent circuit 6.3 AC load line and AC equivalent circuit 6.4 Calculation of gain
	28/04/2022	6.5 Phase reversal 6.6 H-parameters of transistors 6.7 Simplified H-parameters of transistors
	29/04/2022	6.8 Generalised approximate model 6.9 Analysis of CB, CE, CC amplifier using generalised approximate model
9th (01/05/2022-07/05/2022)	02/05/2022	6.10 Multi stage transistor amplifier 6.10.1 R.C. coupled amplifier 6.10.2 Transformer coupled amplifier
	02/05/2022	6.11 Feed back in amplifier 6.11.1 General theory of feed back 6.11.2 Negative feedback circuit 6.11.3 Advantage of negative feed back
	03/05/2022	**ID-UL-FITRE**
	05/05/2022	6.12 Power amplifier and its classification 6.12.1 Difference between voltage amplifier and power amplifier
	06/05/2022	**CLASS TEST**
10th (09/05/2022-14/05/2022)	09/05/2022	6.12.2 Transformer coupled class A power amplifier 6.12.3 Class A push – pull amplifier

		6.12.4 Class B push – pull amplifier
	09/05/2022	6.13 Oscillators 6.13.1 Types of oscillators 6.13.2 Essentials of transistor oscillator
	12/05/2022	**INTERNAL ASSESSMENT**
	13/05/2022	**INTERNAL ASSESSMENT**
11th (16/05/2022-21/05/2022)	**16/05/2022**	**BUDDHA PURNIMA**
	19/05/2022	6.13.3 Principle of operation of tuned collector, Hartley, colpitt, phase shift, wein-bridge oscillator (no mathematical derivations)
	20/05/2022	**7.FIELD EFFECT TRANSISTOR:** 7.1 Classification of FET 7.2 Advantages of FET over BJT 7.3 Principle of operation of FET
12th (23/05/2022-28/05/2022)	23/05/2022	7.4 FET parameters (no mathematical derivation) 7.4.1 DC drain resistance 7.4.2 AC drain resistance 7.4.3 Trans-conductance
	23/05/2022	**8.OPERATIONAL AMPLIFIERS:** 8.1 General circuit simple of OP-AMP and IC – CA – 741 OP AMP
	26/05/2022	8.2 Operational amplifier stages 8.3 Equivalent circuit of operational amplifier
	27/05/2022	8.4 Open loop OP-AMP configuration 8.5 OPAMP with fed back
13th (30/05/2022-04/06/2022)	**30/05/2022**	**SABITRI AMABASYA**
	02/06/2022	8.6 Inverting OP-AMP 8.7 Non inverting OP-AMP
	03/06/2022	8.8 Voltage follower & buffer
14th (06/06/2022-10/06/2022)	06/06/2022	8.9 Differential amplifier 8.9.1 Adder or summing amplifier 8.9.2 Sub tractor
	06/06/2022	8.9.3 Integrator

		8.9.4 Differentiator 8.9.5 Comparator
	09/06/2022	**CLASS TEST**
	10/06/2022	**REVISION**