

### LESSON PLAN: ANALOG ELECTRONICS AND OPAMP SUMMER 2023

Discipline: ELECTRICAL	Semester: 4 <sup>th</sup> SUMMER 2023	Name of the teaching faculty: SIBA PRASAD SAMANTARAYA
Subject: ANALOG ELECTRONICS AND OP-AMP	No of days/per week class allotted: 04	Semester From Date: 14 FEB 23 To Date: 23 MAY 23 No of weeks:14
Week:	Class day:	Theory/practical topics:
1 <sup>ST</sup>	1 <sup>st</sup>	Working of Diode. V-I characteristic of PN junction Diode.
	2 <sup>nd</sup>	DC load line, Ideal Diode, Knee voltage. Zener breakdown, Avalanche breakdown
	3 <sup>rd</sup>	Thermistors, Sensors & barretters Zener Diode,
	4 <sup>th</sup>	Tunnel Diode, PIN Diode
2 <sup>ND</sup>	1 <sup>st</sup>	P-N Diode clipping Circuit, clamping circuit
	2 <sup>nd</sup>	Classification of rectifiers Analysis of half wave, full wave centre tapped and Bridge rectifiers. Calculate: DC output current and voltage, RMS output current and voltage, Rectifier efficiency, Ripple factor, Regulation, Transformer utilization factor, Peak inverse voltage
3 <sup>RD</sup>	3 <sup>rd</sup>	
	4 <sup>th</sup>	
	1 <sup>st</sup>	
	2 <sup>nd</sup>	Filters: Shunt capacitor filter, Choke input filter, $\pi$ filter
4 <sup>TH</sup>	3 <sup>rd</sup>	
	4 <sup>th</sup>	Different modes of operation of transistor.
	1 <sup>st</sup>	Current components in a transistor, Transistor as an amplifier
	2 <sup>nd</sup>	Transistor circuit configuration & its characteristics: CB Configuration, CE Configuration, CC Configuration
5 <sup>TH</sup>	3 <sup>rd</sup>	
	4 <sup>th</sup>	
	1 <sup>st</sup>	Transistor biasing, Stabilization: Stability factor, Different method of Transistors Biasing, Base resistor method, Collector to base bias Self bias or voltage divider method
	2 <sup>nd</sup>	
6 <sup>TH</sup>	3 <sup>rd</sup>	
	4 <sup>th</sup>	
	1 <sup>st</sup>	<b>CLASS TEST-I</b>
	2 <sup>nd</sup>	<b>INTERNAL TEST</b>
7 <sup>TH</sup>	3 <sup>rd</sup>	Practical circuit of transistor amplifier, DC load line and DC equivalent circuit, AC load line and AC equivalent circuit, Calculation of gain, Phase reversal
	4 <sup>th</sup>	
	1 <sup>st</sup>	
	2 <sup>nd</sup>	
8 <sup>TH</sup>	3 <sup>rd</sup>	H-parameters of transistors, Simplified H-parameters of transistors Generalised approximate model, Analysis of CB, CE, CC amplifier using generalised approximate model
	4 <sup>th</sup>	
	1 <sup>st</sup>	
	2 <sup>nd</sup>	Multi stage transistor amplifier, R.C. coupled amplifier, Transformer coupled amplifier,
9 <sup>TH</sup>	3 <sup>rd</sup>	
	4 <sup>th</sup>	
	1 <sup>st</sup>	General theory of feed back, Negative feedback circuit, Feed back in amplifier, Advantage of negative feed back
	2 <sup>nd</sup>	

10 <sup>TH</sup>	3 <sup>rd</sup>	Power amplifier and its classification, Difference between voltage, amplifier and power amplifier, Transformer coupled class A power amplifier, Class A push – pull amplifier, Class B push – pull amplifier
	4 <sup>th</sup>	
	1 <sup>st</sup>	
	2 <sup>nd</sup>	
11 <sup>TH</sup>	3 <sup>rd</sup>	Oscillators, Types of oscillators, Essentials of transistor oscillator Principle of operation of tuned collector, Hartley, colpitt, phase shift, wein- bridge oscillator (no mathematical derivations)
	4 <sup>th</sup>	
	1 <sup>st</sup>	
	2 <sup>nd</sup>	
12 <sup>TH</sup>	3 <sup>rd</sup>	Classification of FET, Advantages of FET over BJT, Principle of operation of FET. FET parameters (no mathematical derivation), DC drain resistance, AC drain resistance, Trans-conductance, Biasing of FET
	4 <sup>th</sup>	
	1 <sup>st</sup>	
	2 <sup>nd</sup>	
13 <sup>TH</sup>	3 <sup>rd</sup>	General circuit simple of OP-AMP and IC – CA – 741 OP AMP Operational amplifier stages, Equivalent circuit of operational amplifier, Open loop OP-AMP configuration. OPAMP with feed back. Inverting OP-AMP, Non inverting OP-AMP.
	4 <sup>th</sup>	
	1 <sup>st</sup>	
	2 <sup>nd</sup>	
14 <sup>TH</sup>	3 <sup>rd</sup>	Voltage follower & buffer, Differential amplifier, Adder or summing amplifier, Subtractor, Integrator, Differentiator, Comparator
	4 <sup>th</sup>	
	1 <sup>st</sup>	
	2 <sup>nd</sup>	
		<b>CLASS TEST-II</b>
	3 <sup>rd</sup>	<b>REVISION</b>
	4 <sup>th</sup>	<b>REVISION</b>



Siba Prasad Samantaraya  
Lect. in Electronics  
GP Kalahandi



# LESSON PLAN

## GOVT POLYTECHNIC KALAHANDI, BHAWANIPATNA

Faculty Name: BHUBANTA KAND      BRANCH: ELECTRICAL      SEM: 4TH      SESSION: 2022-23(S)

SUB: GTD(TH4)	No. of days/ week Class allotted: 5 Total Periods: 60	w.e.f. 14.02.2023 to 25.05.23
Week	Class Day	Theory
1 <sup>st</sup>	1 <sup>st</sup>	<b>1. GENERATION OF ELECTRICITY</b> 1.1 Elementary idea on generation of electricity from Thermal, Hydel, Nuclear, Power station.
	2 <sup>nd</sup>	-DO-
	3 <sup>rd</sup>	-DO-
	4 <sup>th</sup>	-DO-
2 <sup>nd</sup>	1 <sup>st</sup>	1.2 Introduction to Solar Power Plant (Photovoltaic cells).
	2 <sup>nd</sup>	1.3 Layout diagram of generating stations
	3 <sup>rd</sup>	-DO-
	4 <sup>th</sup>	<b>2. TRANSMISSION OF ELECTRIC POWER</b> 2.1 Layout of transmission and distribution scheme.
3 <sup>rd</sup>	1 <sup>st</sup>	-DO-
	2 <sup>nd</sup>	2.2 Voltage Regulation & efficiency of transmission.
	3 <sup>rd</sup>	2.3 State and explain Kelvin's law for economical size of conductor.
	4 <sup>th</sup>	2.4 Corona and corona loss on transmission lines
4 <sup>th</sup>	1 <sup>st</sup>	<b>3. OVER HEAD LINES</b> 3.1 Types of supports, size and spacing of conductor.
	2 <sup>nd</sup>	3.2 Types of conductor materials.
	3 <sup>rd</sup>	-DO-
	4 <sup>th</sup>	3.3 State types of insulator and cross arms.
5 <sup>th</sup>	1 <sup>st</sup>	3.4 Sag in overhead line with support at same level and different level. (approximate formula effect of wind, ice and temperature on sag).
	2 <sup>nd</sup>	-DO-
	3 <sup>rd</sup>	3.5 Simple problem on sag.
	4 <sup>th</sup>	<b>4. PERFORMANCE OF SHORT &amp; MEDIUM LINES</b> 4.1. Calculation of regulation and efficiency.
6 <sup>th</sup>	1 <sup>st</sup>	-DO-
	2 <sup>nd</sup>	-DO-
	3 <sup>rd</sup>	-DO-
	4 <sup>th</sup>	-DO-
7 <sup>th</sup>	1 <sup>st</sup>	-DO-
	2 <sup>nd</sup>	-DO-
	3 <sup>rd</sup>	<b>5. EHV TRANSMISSION</b> 5.1 EHV AC transmission. 5.1..1. Reasons for adoption of EHV AC transmission. 5.1..2. Problems involved in EHV transmission.
	4 <sup>th</sup>	-DO-
8 <sup>th</sup>	1 <sup>st</sup>	-DO-
	2 <sup>nd</sup>	-DO-
	3 <sup>rd</sup>	5.2 HV DC transmission. 5.2..1. Advantages and Limitations of HVDC transmission system.
	4 <sup>th</sup>	-DO-
9 <sup>th</sup>	1 <sup>st</sup>	-DO-



	2 <sup>nd</sup>	<b>6. DISTRIBUTION SYSTEMS</b> 6.1 Introduction to Distribution System.
	3 <sup>rd</sup>	6.2 Connection Schemes of Distribution System: (Radial, Ring Main and Inter connected system)
	4 <sup>th</sup>	-DO-
10 <sup>th</sup>	1 <sup>st</sup>	6.3 DC distributions. 6.3.1 Distributor fed at one End. 6.3.2 Distributor fed at both the ends. 6.3.3 Ring distributors.
	2 <sup>nd</sup>	-DO-
	3 <sup>rd</sup>	6.4 AC distribution system. 6.4.1. Method of solving AC distribution problem. 6.4.2. Three phase four wire star connected system arrangement.
	4 <sup>th</sup>	-DO-
11 <sup>th</sup>	1 <sup>st</sup>	<b>7. UNDERGROUND CABLES</b> 7.1 Cable insulation and classification of cables.
	2 <sup>nd</sup>	-DO-
	3 <sup>rd</sup>	7.2 Types of L. T. & H.T. cables with constructional features
	4 <sup>th</sup>	-DO-
12 <sup>th</sup>	1 <sup>st</sup>	7.3 Methods of cable lying.
	2 <sup>nd</sup>	7.4 Localization of cable faults: Murray and Varley loop test for short circuit fault / Earth fault.
	3 <sup>rd</sup>	<b>8. ECONOMIC ASPECTS</b> 8.1 Causes of low power factor and methods of improvement of power factor in power system.
	4 <sup>th</sup>	8.2 Factors affecting the economics of generation: (Define and explain) 8.2.1 Load curves. 8.2.2 Demand factor. 8.2.3 Maximum demand. 8.2.4 Load factor. 8.2.5 Diversity factor. 8.2.6 Plant capacity factor.
13 <sup>th</sup>	1 <sup>st</sup>	-DO-
	2 <sup>nd</sup>	-DO-
	3 <sup>rd</sup>	-DO-
	4 <sup>th</sup>	8.3 Peak load and Base load on power station.
14 <sup>th</sup>	1 <sup>st</sup>	<b>9. TYPES OF TARIFF</b> 9.1. Desirable characteristic of a tariff.
	2 <sup>nd</sup>	9.2. Explain flat rate, block rate, two part and maximum demand tariff. (Solve Problems)
	3 <sup>rd</sup>	-DO-
	4 <sup>th</sup>	<b>10. SUBSTATION</b> 10.1 Layout of LT, HT and EHT substation.
15 <sup>th</sup>	1 <sup>st</sup>	-DO-
	2 <sup>nd</sup>	10.2 Earthing of Substation, transmission and distribution lines.
	3 <sup>rd</sup>	-DO-
	4 <sup>th</sup>	DOUBT CLEARING CLASS

Band

Bhubanta Kand.



# LESSON PLAN

## GOVT POLYTECHNIC KALAHANDI, BHAWANIPATNA

Faculty Name: SATYAPRAKASH OJHA      BRANCH: ELECTRICAL      SEM: 4TH      SESSION: 2022-23(S)

**SUBJECT:**  
**ELECTRICAL MACHINE**  
**LAB-1**

**No. of days/ week**  
**Class allotted: 6**  
**Total Periods: 90**

w.e.f. 14.02.2023 to 25.05.23

### Theory

Week	Class Period	
1 <sup>st</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	1. Identification of different terminals of a DC machine by test lamp method and multi-meter method & to measure insulation resistance by megger.
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-DO-
2 <sup>nd</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	-DO-
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	2. Dimensional and material study of various parts of a DC machine.
3 <sup>rd</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	-DO-
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	3. Plot OCC of a DC shunt generator at constant speed and determine critical resistance from the graph.
4 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	-DO-
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	4. Plot External Characteristics of a DC shunt generator at constant speed.
5 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	-DO-
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	5. Study of Three point starter, connect and run a DC shunt motor & measure the no load current.
6 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	-DO-
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	6. Study of Four point starter, connect and run a DC compound motor & measure no load current.
7 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	-DO-



	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-DO-
8 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	7. Control the speed of a DC shunt motor by field flux control method & armature voltage control method.
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-DO-
9 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	8. Determine the armature current vs. speed characteristic of a DC motor
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-DO-
10 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	9. Determine the efficiency of a DC machine by brake test method.
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-DO-
11 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	10. Identification of terminals, determination of voltage transformation ratio of a single phase transformer.
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-DO-
12 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	11. Perform OC Test and SC test of a single phase transformer.
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-DO-
13 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	-DO-
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	12. Determine the voltage regulation of a single phase transformer at different loads.
14 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	-DO-
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-DO-
15 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	13. Polarity test of single phase transformer and parallel operation of two single phase transformers.
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-DO-

*ghe*  
*Satyaprakash Dine*



# LESSON PLAN

GOVT POLYTECHNIC KALAHANDI, BHAWANIPATNA

Faculty Name: SATYAPRAKASH OJHA

BRANCH: ELECTRICAL

SEM: 4TH

SESSION: 2022-23(S)

**SUBJECT:**  
**ELECTRICAL**  
**DRAWING**

No. of days/ week  
Class allotted: 6  
Total Periods: 90

w.e.f. 14.02.2023 to 25.05.23

Week	Class Period	Theory
1 <sup>st</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	1. WIRING DIAGRAM AND CONTROL CIRCUIT 1.1 3 point D. C. motor starter.
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	1.2 4 point D.C. motor starter.
2 <sup>nd</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	1.3 DOL starter
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	1.4 Star delta starter.
3 <sup>rd</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	1.5 Auto Transformer Starter.
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	1.6 Rotor resistance starter
4 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	2. DRAW D.C. M/C PARTS (Dimensional Drawing) 2.1. Pole with pole shoes.
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	2.2. Commutator
5 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	2.3. Armature
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	2.4. DC. armature winding (a) Simple lap winding
6 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	-DO-
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	(b) Simple wave winding.
7 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	3. DRAW 1-PHASE & 3-PHASE TRANSFORMER (Assembly Drawing) 3.1 Stepped core type



	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-DO-
8 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	3.2 Plane shell type.
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-DO-
9 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	<b>4.DRAW SKETCHES OF THE FOLLOWING AS PER B.I.S AND REC SPECIFICATIONS</b> 5.1 Earthing installation.
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-DO-
10 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	-DO-
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	5.2 Double pole structure for LT and HT distribution lines.
11 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	-DO-
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-DO-
12 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	<b>5.DRAW SINGLE LINE DIAGRAM OF SUBSTATION</b> 6.1 Single line diagram of 33/11kV distribution substation
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-DO-
13 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	6.2 Single line diagram of a 11/0.4 kV distribution substation.
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	<b>6.COMPUTER AIDED ELECTRICAL DRAWING USING SOFT WARE</b> 8.1 Draw Electrical symbols (take Print out)
14 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	8.2 Draw D.C. m/c parts (take print out)
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	8.3 Draw A. C. m/c parts (take print out)
15 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	8.4 Draw electrical layout of diagram of Electrical Installation of a building.
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-DO-

*Satyaprakash Ojha*



# LESSON PLAN

## GOVT POLYTECHNIC KALAHANDI, BHAWANIPATNA

Faculty Name: SATYAPRAKASH OJHA

BRANCH: ELECTRICAL

SEM: 4TH

SESSION: 2022-23(S)

SUB:  
EMI

No. of days/ week  
Class allotted: 5  
Total Periods: 75

w.e.f. 14.02.2023 to 25.05.23

Week	Class Day	
1 <sup>st</sup>	1 <sup>st</sup>	<b>Theory</b>
		<b>1.MEASURING INSTRUMENTS</b>
	2 <sup>nd</sup>	1.1 Define Accuracy, precision, Errors, Resolutions Sensitivity and tolerance.
	3 <sup>rd</sup>	1.2 Classification of measuring instruments.
	4 <sup>th</sup>	1.3 Explain Deflecting, controlling and damping arrangements in indicating type of instruments.
2 <sup>nd</sup>	5 <sup>th</sup>	-DO-
	1 <sup>st</sup>	1.4 Calibration of instruments.
	2 <sup>nd</sup>	<b>Tutorial Chapter 1</b>
	3 <sup>rd</sup>	-DO-
	4 <sup>th</sup>	<b>2.ANALOG AMMETERS AND VOLTMETERS</b>
3 <sup>rd</sup>	5 <sup>th</sup>	2.1. Describe Construction, principle of operation, errors, ranges merits and demerits of:
	1 <sup>st</sup>	2.1.1 Moving iron type instruments.
	2 <sup>nd</sup>	2.1.1 Moving iron type instruments.
	3 <sup>rd</sup>	2.1.2 Permanent Magnet Moving coil type instruments.
	4 <sup>th</sup>	2.1.3 Dynamometer type instruments
4 <sup>th</sup>	5 <sup>th</sup>	2.1.4 Rectifier type instruments
	1 <sup>st</sup>	2.1.5 Induction type instruments
	2 <sup>nd</sup>	2.2 Extend the range of instruments by use of shunts and Multipliers.
	3 <sup>rd</sup>	-DO-
	4 <sup>th</sup>	2.3 Solve Numerical
5 <sup>th</sup>	5 <sup>th</sup>	-DO-
	1 <sup>st</sup>	<b>Tutorial Chapter 2</b>
	2 <sup>nd</sup>	-DO-
	3 <sup>rd</sup>	<b>3.WATTMETERS AND MEASUREMENT OF POWER</b>
	4 <sup>th</sup>	3.1 Describe Construction, principle of working of Dynamometer type wattmeter. (LPF and UPF type)
6 <sup>th</sup>	5 <sup>th</sup>	-DO-
	1 <sup>st</sup>	-DO-
	2 <sup>nd</sup>	-DO-
	3 <sup>rd</sup>	3.2 The Errors in Dynamometer type wattmeter and methods of their correction.
	4 <sup>th</sup>	-DO-
7 <sup>th</sup>	5 <sup>th</sup>	-DO-
	1 <sup>st</sup>	3.3 Discuss Induction type watt meters.
	2 <sup>nd</sup>	-DO-
	3 <sup>rd</sup>	<b>Tutorial Chapter 3</b>
	4 <sup>th</sup>	-DO-
8 <sup>th</sup>	5 <sup>th</sup>	<b>4.ENERGYMETERS AND MEASUREMENT OF ENERGY</b>
	1 <sup>st</sup>	4.1 Introduction
	2 <sup>nd</sup>	-DO-
	3 <sup>rd</sup>	4.2 Single Phase Induction type Energy meters – construction, working principle and their compensation & adjustments.
	4 <sup>th</sup>	-DO-
9 <sup>th</sup>	5 <sup>th</sup>	-DO-
		4.3 Testing of Energy Meters.



8 <sup>th</sup>	1 <sup>st</sup>	-DO-
	2 <sup>nd</sup>	-DO-
	3 <sup>rd</sup>	<b>Tutorial Chapter 4</b>
	4 <sup>th</sup>	-DO-
	5 <sup>th</sup>	<b>5.MEASUREMENT OF SPEED, FREQUENCY AND POWER FACTOR</b> 5.1 Tachometers, types and working principles
9 <sup>th</sup>	1 <sup>st</sup>	-DO-
	2 <sup>nd</sup>	-DO-
	3 <sup>rd</sup>	5.2 Principle of operation and construction of Mechanical and Electrical resonance Type frequency meters.
	4 <sup>th</sup>	-DO-
	5 <sup>th</sup>	5.3 Principle of operation and working of Dynamometer type single phase and three phase power factor meters.
10 <sup>th</sup>	1 <sup>st</sup>	-DO-
	2 <sup>nd</sup>	<b>Tutorial Chapter 5</b>
	3 <sup>rd</sup>	-DO-
	4 <sup>th</sup>	<b>6.MEASUREMENT OF RESISTANCE, INDUCTANCE &amp; CAPACITANCE</b> 6.1 Classification of resistance
	5 <sup>th</sup>	6.1.1. Measurement of low resistance by potentiometer method.
11 <sup>th</sup>	1 <sup>st</sup>	6.1.2. Measurement of medium resistance by wheat Stone bridge method
	2 <sup>nd</sup>	6.1.3. Measurement of high resistance by loss of charge method.
	3 <sup>rd</sup>	6.2 Construction, principle of operations of Megger & Earth tester for insulation resistance and earth resistance measurement respectively
	4 <sup>th</sup>	6.3 Construction and principles of Multimeter. (Analog and Digital)
	5 <sup>th</sup>	6.4 Measurement of inductance by Maxwell's Bridge method.
12 <sup>th</sup>	1 <sup>st</sup>	6.5 Measurement of capacitance by Schering Bridge method
	2 <sup>nd</sup>	<b>Tutorial Chapter 6</b>
	3 <sup>rd</sup>	-DO-
	4 <sup>th</sup>	<b>7.SENSORS AND TRANSDUCER</b> 7.1. Define Transducer, sensing element or detector element and transduction elements. 7.2. Classify transducer. Give examples of various class of transducer.
	5 <sup>th</sup>	7.3. Resistive transducer 7.3.1 Linear and angular motion potentiometer.
13 <sup>th</sup>	1 <sup>st</sup>	7.3.2 Thermistor and Resistance thermometers. 7.3.3 Wire Resistance Strain Gauges
	2 <sup>nd</sup>	7.4. Inductive Transducer
	3 <sup>rd</sup>	7.4.1 Principle of linear variable differential Transformer (LVDT) 7.4.2 Uses of LVDT.
	4 <sup>th</sup>	7.5. Capacitive Transducer. 7.5.1 General principle of capacitive transducer.
	5 <sup>th</sup>	7.5.2 Variable area capacitive transducer.
14 <sup>th</sup>	1 <sup>st</sup>	7.5.3 Change in distance between plate capacitive transducer.
	2 <sup>nd</sup>	7.6. Piezo electric Transducer and Hall Effect Transducer with their applications.
	3 <sup>rd</sup>	<b>Tutorial Chapter 7</b>
	4 <sup>th</sup>	-DO-
	5 <sup>th</sup>	<b>8.OSCILLOSCOPE</b> 8.1. Principle of operation of Cathode Ray Tube.
15 <sup>th</sup>	1 <sup>st</sup>	8.2. Principle of operation of Oscilloscope (with help of block diagram).
	2 <sup>nd</sup>	-do-
	3 <sup>rd</sup>	8.3. Measurement of DC Voltage & current.
	4 <sup>th</sup>	8.4. Measurement of AC Voltage, current, phase & frequency.
	5 <sup>th</sup>	<b>Tutorial Chapter 6</b>

*Satyaprakash Singh*



# LESSON PLAN

GOVT POLYTECHNIC KALAHANDI, BHAWANIPATNA

**Faculty Name:** Kambhudeep Bag

**BRANCH:** ELECTRICAL

**SEM:** 4TH

**SESSION:** 2022-23(S)

**SUBJECT:**  
MATLAB

**No. of days/ week**  
**Class allotted:** 3  
**Total Periods:** 45

**w.e.f.** 14.02.2023 **to** 25.05.23

Week	Class Period	Theory
1 <sup>st</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	<b>Introduction to MATLAB programming</b> 1.1. Functions and operation using variables and arrays. 1.1.1. To learn algebraic, trigonometric and exponential manipulation. 1.1.2. To learn Arithmetic, Relational and Logic operator.
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-do-
2 <sup>nd</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	-do-
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-do-
3 <sup>rd</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	1.2. Matrix formation and its manipulation.
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-do-
4 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	1.3. Vector manipulation: 1.3.1. Use of linspace to create vectors. 1.3.2. To create, add and multiply vectors. 1.3.3. Use of sin and sqrt functions with vector arguments
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-do-
5 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	1.4. Plotting: 1.4.1. Two dimensional Plots and sub plots 1.4.2. Label the plot and printing.
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-do-
6 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	-do-
	4 <sup>th</sup> 5 <sup>th</sup> 6 <sup>th</sup>	-do-
7 <sup>th</sup>	1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	1.5. Write and execute a file to plot a circle, impulse, step, ramp, sine and cosine functions.

*Kambhudeep Bag*