GOVERNMENT CO-ED POLYTECHNIC, JAGDALPUR BASTAR (C.G)

DEPARTMENT OF ELECTRICAL ENGINEERING

LESSON PLAN

Session: - **July - Dec 2025**
Semester: - **3rd**
Session start date as per University Calendar: - 06/10/2025
Course Name: - **Electrical and Electronic Measurements**
Course Code: - **(2024372(024))**
Name of Subject teacher:- **BHOLENATH TAMBOLI**

Unit -1 Basics of Measurements and Measuring Instruments				
Class Room Instruction (CI)	**No. of Periods**	**Laboratory Instruction (LI)**	**No. of Periods**	**Remark**
1.1 Block Diagram of measuring systems, requirements	2	1.1 Selection of indicating, Recording and Integrating Instruments in the laboratory and writing their specifications.	2	
1.2 Production of deflecting, controlling and damping torques	2	1.2 Demonstration of construction and working principle of moving iron and moving coil type instruments.		
1.3 Accuracy, precision, Error, Resolution, Sensitivity and tolerance: Only Definition	1	1.3 Demonstration of construction and working principle of Induction type and dynamometer type instruments.	1	
1.4 Indicating , Recording and Integrating Instruments, Typical uses	2			
1.5 Electromechanical measuring instruments: General description including working principle, construction applications, merits and demerits of-PMMC, Moving iron, Induction, Dynamometers type instruments	5			

Number of periods planned (CI + LI) : 12+03

Unit – 2 Electromechanical measuring Instruments

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
2.1 Principle of current and voltage measurement, Galvanometer, Ammeter, Voltmeter	1	**2.1** Measurement of DC, AC voltage and current using analogue meter.		
2.2 Range Extension of ammeter and voltmeter using Shunts and Multipliers, Current Transformer (CT) and Potential Transformer (PT)	2	**2.2** Conversion of a given galvanometer to DC/AC current-meter/voltmeter.		
2.3 Principle of Power and energy Measurement, effect of power factor,	1	**2.3** Measurement of high value of current and voltages using shunt resistance and multiplier.		
2.4 Measurement of single and three phase power using wattmeter	2		3	
2.5 Measurement of single phase energy using watt-hour meter.	1	**2.4** Measurement of single and three phase power using wattmeter.		
		2.5 Calibration of ammeter, voltmeter with a standard meter.	2	
2.6 Calibration of ammeters, voltmeters, wattmeter's and energy meters.	2	**2.6** Demonstration of working of a digital energy meter		
2.7 Working of Digital energy meter, Block diagram	1		1	

Number of periods planned (CI + LI) : 10+06

Unit – 3 Measurements using Bridges/meters

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
3.1 Classification of resistances-Low, Medium, High, Concept of bridge, balancing.	1	**3.1** Measurement of low Resistance using Kelvin's double bridge.		
3.2 Low resistance Measurement – Kelvin double bridge.	1	**3.2** Measurement of medium Resistance using wheat stone bridge.	2	
3.3 Medium resistance measurement Wheatstone bridge.	1	**3.3** Measurement of insulation resistance using Megger.		
3.4 High resistance measurement using Megger.	2	**3.5** Measurement of earth resistance using Earth tester.	2	

3.5 Earth resistance measurement using earth tester.	2			
3.6 Inductance\Measurement using Maxwell's Bridge	1	**3.6** Measurement of inductance using Maxwell's Bridge.	1	
3.7 Capacitance Measurement: Schering Bridge	1	**3.7** Measurement of capacitance using Schering's Bridge.	1	

Number of periods planned (CI + LI) : 09+06

Unit – 4 Electronic instruments

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
4.1 Essentials and advantages of electronic instruments.	1	**4.1** Measurement of voltage, current, resistance using Digital Multi meter.	2	
4.2 True RMS reading voltmeter.	1	**4.2** Continuity test using digital Multi meter		
4.3 Digital Voltmeters(DVM) and its types.	4	**4.3** Measurement of resistance Inductance and Capacitance using LCR meters.	2	
4.4 Digital multi meters.	2	**4.4** Demonstration of various analog/digital recorders.		
4.5 Digital LCR meter- Block diagram, Working principle.	1			
4.6 Analog/Digital recorders, Graphic recorder, Strip Chart recorder, XY recorder (Only block diagram)	1			

Number of periods planned (CI + LI) : 10+04

Unit – 5 Cathode Ray Oscilloscope and Digital Storage Oscilloscope

Class Room Instruction (C I)	No. of Periods	Laboratory Instruction (L I)	No. of Periods	Remark
5.1 CRO-basic clock diagram	2	**5.1** Measurement of amplitude, Frequency, time period and Phase difference of different signals generated by function generator using CRO.	1	
5.2 Cathode Ray Tube.	1	**5.2** Measurement of Unknown frequency, phase angle using Lissajous patterns.	1	
5.3 Electrostatic and magnetic deflection.	1	**5.3** Demonstration of Digital Storage Oscilloscope.	1	
5.4 X & Y Amplifiers	1			
5.5 Controls on CRO and their functions, Lissajous pattern	1			
5.6 Digital Storage Oscilloscope-Basic block diagram and working	2			

Number of periods planned (CI + LI) : 08+03
Number of periods actually taken :

Number of Total periods planned : 49

Bholenath Tamboli
(Name and Signature)

Subject Teacher

HOD
(Department of Electrical Engineering)

GOVERNMENT CO-ED POLYTECHNIC,JAGDALPUR BASTAR(C.G)

DEPARTMENT OF ELECTRICAL ENGINEERING

LESSON PLAN

Session: - **Nov - Dec 2025**
Semester: - **3rd**
Session start date as per University Calendar: - **29/09/2025**
Course Name: - **DC Machines & Transformers**
Course Code: - **2024373(024)**
Name of Subject teacher:- **AJAY KUMAR SWARNKAR**

Unit-1 Basics of DC Machines

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
1.1 Law of Conservation of Energy	2	**1.1** Illustrate the principle of lector mechanical energy conversion using BLV method.	2	
1.2 Electromagnetic Induction, Faraday's Laws of electromagnetic induction, Lenz's Law-Concept and applications	2	**1.2** Identification of parts of a DC machine by dismantling the cut section model.	2	
1.3 Fleming's right and left hand rule	1	**1.3** Measure Resistance of a series, shunt field winding and armature winding of DC compound machine and comment on their relatives resistances	2	
1.4 DC machines construction, its parts	2			
1.5 EMF equations: EMF, Back EMF	2			

Number of periods planned (CI + LI) : 15
Number of periods actually taken :

Unit 2 DC generators

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
2.1 Working and application of DC generators	1	**2.1** Perform load test on DC shunt generator.	2	
2.2 EMF equation	1	**2.2** Perform a test to analyse the effect of speed and field flux on generated voltage of DC shunt generator.	2	
2.3 Performance of DC generators- Efficiency, losses	2			
2.4 Condition for building up EMF in self-excited generator	1	**2.3** Perform load test on DC series generator.	2	
2.5 Internal and External Characteristics	1			
2.6 Concept of armature reaction and its effects	2			
2.7 Concept of commutation	1			

Number of periods planned (CI + LI) : 15
Number of periods actually taken :

Unit 3 DC MOTOR

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
3.1 Working and application different types of DC motors (DC series and DC Shunt motors) .	2	**3.1** Start a DC shunt motor and reverse its direction of rotation.	2	
3.2 EMF equation, Back EMF, Torque speed, Output power, losses and efficiency	2	**3.2** Control the speed of DC shunt motor by flux and armature control method.	2	
		3.3 Perform load test on DC shunt motor and plot its performance characteristics.	2	
3.3 Need of starters and types (two and three point only)	1	**3.4** Perform load test on DC series motor and plot its performance characteristics.	2	
3.4 Compare the performance of series and shunt.	1	**3.5** Perform brake test on DC shunt motor and plot its performance characteristics.	2	
3.5 Speed control methods of DC Shunt and series motor	1			

Number of periods planned (CI + LI) : 17
Number of periods actually taken :

Unit 4 Single Phase Transformer				
Class Room Instruction (CI)	**No. of Periods**	**Laboratory Instruction (LI)**	**No. of Periods**	**Remark**
4.1 working principle, construction, types- shell and core	1	**4.1** Perform test to determine voltage and current ratio of a given single phase transformer.	1	
4.2 Emf equation, Voltage and current transformation ratio. Equivalent circuit parameters, phasor diagram of practical transformer under no load and lagging load conditions in brief	1	**4.2** Perform polarity test on single phase transformer.	1	
		4.3 Perform Open circuit and short circuit test on a single phase transformer and determine the equivalent circuit parameters.	1	
4.3 Losses: Iron loss-hysteresis and eddy current, copper loss	1	**4.4** Perform direct load test to determine efficiency and regulation of a single phase transformer.	1	
4.4 Efficiency, Condition for maximum efficiency and voltage regulation for lagging load only (No derivation)	1	**4.5** Verify the use of single phase auto transformer as a step up and step down transformer.	1	
4.5 OC & SC test	1			
4.6 Concept of All Day Efficiency and its significance	1			
4.7 Parallel operation of two single phase transformers, essential and desirable conditions	1			
4.8 Construction and application of autotransformer.	1			

Number of periods planned (CI + LI) : 15
Number of periods actually taken :

Unit 5 Poly phase transformer				
Class Room Instruction (CI)	**No. of Periods**	**Laboratory Instruction (LI)**	**No. of Periods**	**Remark**
5.1 Formulation of three phase transformation by three single phase transformers	1	**5.1** Perform parallel operation of two three phase transformers	2	
5.2 3 phase star delta connection	1			

5.3 Constructional Details: Accessories of 3 phase transformers	1			
5.4 Parallel operation of two three phase transformers **5.5** Cooling methods of power transformers **5.6** Maintenance procedures of different types of 3 phase transformers	1 1 1			

Number of periods planned (CI + LI) : 08
Number of periods actually taken :

Number of Total periods planned : 68
Number of Total periods actually taken :

Subject Teacher : AJAY KUMAR SWARNKAR

(Name and Signature)

HOD
(Department of Electrical Engineering)

Principal
Govt Co-ed Polytechnic , Bastar

GOVERNMENT CO-ED POLYTECHNIC,JAGDALPUR BASTAR(C.G)

DEPARTMENT OF ELECTRICAL ENGINEERING

LESSON PLAN

Session: - **Nov-Dec 2025**
Semester: - **3rd**
Session start date as per University Calendar: -
Course Name: - **Electrical Circuit**
Course Code: - **2024371(024)**
Name of Subject teacher:- **ONKAR DEWANGAN**

Unit -1 Principles of Electrical Circuit

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
1.1 Classification Of Electrical Elements: Active & Passive, Unilateral and bilateral, Independent and Dependent Source	1	**1.1** Indentify the commonly used components and materials in an electric circuit. **1.2** Observe Voltage and Current in an incandescent lamp and comment on your observation. **1.3** Measure Voltage and current in a given linear electric circuit.	2	
1.2 Passive Element/Components(R,L and C) : Steady State behavior in DC Circuit	2			
1.3 Simple Series and Parallel Resistive Circuit	1	**1.4** Measure current and voltage in a particular branch of the given electrical circuit using kirchhoff's Current Law. **1.5** Measure voltage Drop in a closed loop of the given electrical circuit using kirchhoff's Voltage Law **1.6** Determine the current and voltage in a given electrical Circuit.	2	
1.4 Ohm's Law, Kirchhoff's Voltage and Current Law	2			
1.5 Numerical	2			
1.6 Source Transformation	1			
1.7 Mesh & Nodal Analysis	2			

Number of periods planned (CI + LI) : 15
Number of periods actually taken :

Unit – 2 Circuit Analysis and Network Theorems

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
2.1 Star Delta Transformation of Passive Network	1	**2.1** Connect star connected resistance to its equivalent Delta connection and determine the equivalent resistance. **2.2** Connect Delta connected resistance to its equivalent Star connection and determine the equivalent resistance. **2.3** Measure Current through and voltage across a circuit element of a given electric Circuit and verify applying mesh and nodal Analysis.	2	
2.2 Superposition Theorem	1			
2.3 Thevenin's Theorem	1			
2.4 Norton's Theorem	1			
2.5 Maximum Power Transfer Theorem	1			
2.6 Application of Theorem to Solve DC Network	6			
		2.4 Measure current in a branch of the given electrical circuit having two or more input sources using Super position theorem. **2.5** Measure load current in the load resistance using Thevenin's theorem in a given circuit. **2.6** Measure load current in the load resistance using Norton's theorem in a given circuit. **2.7** Determine the maximum power and load resistance for which circuit has maximum power using maximum power transfer theorem.	2	

Number of periods planned (CI + LI) : 15
Number of periods actually taken :

Unit – 3 Single Phase AC Circuit

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
3.1 Generation of an alternating EMF	1	**3.1** Measure peak value, RMS value, Period and frequency of a sinusoidal voltage using CRO. **3.2** Observe the behavior of current and voltage wave form in CRO for Resistive load and comment on it.	2	
3.2 AC circuit quantities: Peak value, RMS Value and Average value of a Sinusoidal voltage waveform				
3.3 J-operator	1	**3.3** Observe the behavior of current and voltage wave form in CRO for R-L Load and comment on it.		
3.4 AC Series and parallel circuits, Phasor diagrams and impedance triangle	7			
3.5 Active, reactive, apparent power and power factor in RLC circuit.		**3.4** Measure voltage, current, power and power factor in a series RLC circuit and draw phasor diagram.		
3.6 Vector representation of an alternating quantity, addition, subtraction, multiplication and division.	2	**3.5** Measure voltage, current, power and power factor in a RLC parallel circuit and draw phasor diagram. **3.6** Determine the power and power factor in AC circuit using three ammeter methods.	2	

Number of periods planned (CI + LI) : 15
Number of periods actually taken :

Unit – 4 Series and Parallel resonance

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
4.1 Definition of resonance and its importance in electrical circuit	1	**4.1** Determine the current at series Resonance. **4.2** Observe the variation of power factor for varying inductance for a series RLC circuit.	1	
4.2 Series and Parallel resonance: Derivation of Resonance frequency and simple numerical.	6			
4.3 Definition: Quality factor, bandwidth and selectivity in series RLC circuit.(No derivations)	1	**4.3** Determine the current at parallel resonance. **4.4** Determine the impedance of a Circuit during parallel resonance.	1	
4.4 Effect on current and power factor in series resonance circuit.	2			

Number of periods planned (CI + LI) : 12
Number of periods actually taken :

Unit – 5 Three phase A C circuits

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
5.1 Generation of three phase voltage	1	**5.1** Measure the line/phase current, line voltage/phase voltage for the given three phase load connected to a three phase source.	1	
5.2 Three phase three wire source and three phase four wire source, Phase sequence and phasor diagram	2			
5.3 Connection of three phase winding in Star/Delta	2	**5.2** Measure neutral displacement voltage of the given three phase Unbalanced load connected to a three phase source Measure three phase power for the given star connected load.	1	
5.4 Line and phase electrical quantity relationship: Star/Delta	4			
5.5 Three phase load: Balanced /Unbalanced	1			
5.6 Measurement of power in three phase circuits	4	**5.3** Measure three phase power for the given star/delta connected load.	2	

Number of periods planned (CI + LI) : 18
Number of periods actually taken :

Number of Total periods planned : 75
Number of Total periods actually taken :
Subject Teacher : ONKAR DEWANGAN

(Name and Signature)
Onkar Dewangan

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(Department of Electrical Engineering)

GOVT. CO-ED POLYTECHNIC JAGDALPUR
ADAWAL, DIST - BASTAR (C.G.) 494001
DEPARTMENT OF ELECTRICAL ENGINEERING
LESSON PLAN **SESSION-(NOV-DEC) 2025**

NAME OF FACULTY : TEJESHVARYA
SUBJECT : ELECTRICAL DRAWING AND CAD
SUBJECT CODE : 2024374(024)
SEMESTER : DIPLOMA III SEM

TEXT BOOKS	**BASIC ENGINEERING DRAWING : M.L.ANWANI**
	ENGINEERING MECHANICS: RAMAMRUTHAM, S.
REF. BOOKS	ELECTRICAL ENGINEERING DRAWING:BHATTACHARYA,S.K.
	COMPUTER AIDED ELECTRICAL DRAWING :B.S.NANDAN

LECT. N0.	UNIT	TOPIC TO BE COVERED	Expected No of Lectures	REMARKS
		UNIT-1 SYMBOLS AND CODES		
1	1	ISI Symbols in electrical engineering	1	
2		Conventions for circuit	1	
3		Schematic representation of electrical components	1	
4		Schematic representation of electronic components	1	
	2	**UNIT-2 INSTALLATION,MOUNTING AND LAYOUT OF POWER AND SAFETY EQUIPMENT**		
5		Different types of mounting for transformer	1	
6		Mountings for dynamic equipment	1	
7		substation layout with circuit breaker,isolators	1	
8		substation layout with protective devicesof transformers	1	
9		Plate earthing	1	
10		Pipe earthing	1	
11		Extension of range using shunt,multiplier	1	
12		Extension of range using CT,PT	1	
	3	**UNIT-3 CONSTRUCTIONAL FEATURES OF ELECTRICAL MACHINES**		
13		Parts of transformer	1	
14		DC Machines:pole,pole shoe	1	
15		simlex lap and wave winding	1	
16		Alternators:salient rotor	1	
17		Alternators: cylindrical rotor	1	
18		Induction motor:squirrel cage rotor	1	
19		Induction motor: slip ring rotor	1	
20		AC Machine winding: full and short pitch winding	1	
	4	**UNIT -4 DOMESTIC AND COMMERCIAL WIRING FOR LV EQUIPMENT**		
21		Types and internal circuit diagram	1	
22		control wiring of godown	1	
23		staircase wiring	1	
24		control wiring of street light	1	
25		control wiring for houses	1	
26		wiring of energy meters for domestic loads	1	
27		wiring of energy meters for commercial loads	1	
28		internal wiring of refrigerators	1	
29		internal wiring of air conditioners	1	
30		starter,4-point starter	1	
31		wiring diagram of submersible and centrifugal pumps	1	
	5	**UNIT-5 COMPUTER AIDED ELECTRICAL DRAWING (CAD)**		
32		Draw command , edit command,coordinate entry ,osnap	1	
33		layers , dimensioning,text in a drawing ,ortho command ,zoom command , plot command	1	
34		layouts of domestic , commercial and industrial wiring	1	
35		cross sectional view of : fuse and cables	1	
36		DC motors and their parts	1	
37		single phase transformer	1	
38		power transformer	1	
39		Induction motor	1	
40		insulators,circuit breakers,lightning arresters	1	
41		11kv pole mounted substation	1	
42		single line diagram of 11/33 kv substation.	1	
TOTAL CLASSES SCHEDULED : 42				
TOTAL CLASSES TAKEN:			Signature of Faculty	HOD Signature

Tejeshvaryo