ELECTRICAL ENGINEERING DEPARTMENT

LESSON PLANS

(August-November 2026)

Name of the Faculty			Mr AHISHEK KUMAR	
Discipline			Electrical Engineering	
Semester			3rd Semester	
Subject			Electrical Machines-I	
Lesson Plan Duration			15-16 Week	
Week	**Theory**		**Practical**	
	Lecture	**Topic (including assignment / test)**	**Day**	**Topic**
1	1	Definition of motor and generator.	1, 2	Measurement of the angular displacement of the rotor of a slip-ring induction motor on.
	2	Concept of torque.	3,4	Application of DC to stator of motor winding in sequence and simultaneously to each phase of rotor winding.
	3	Torque development due to alignment of two fields, concept of torque angle.	5.6	Measurement of the angular displacement of the rotor of a slip-ring induction motor.
2	4	Electro-magnetically induced emf	4	Application of DC to stator of motor winding in sequence and simultaneously to each phase
	5	Elementary concept of an electrical machine	5	Speed control of dc shunt motor (i) Armature control method (ii) Field control method
	6	Main constructional features of DC machines. Comparison of generator and motor,	6	Study of dc series motor with starter (to operate the motor on no load for a moment)
3	7	Function of the commutator for motoring action.	7	Study of 3-point starter for starting D.C. shunt motor.
	8	Function of the commutator for generation action	8	To perform open circuit and short circuit test for determining: (i) equivalent circuit (ii) the regulation and (iii) efficiency of a transformer from the data obtained from open circuit and short circuit test at full load
	9	Factors determining induced emf, Factors determining the electromagnetic torque	9	
4	10	Types of dc generation on the basis of excitation.		
	11	Significance of back e.m.f built up in a dc shunt generator,	10	To find the efficiency and regulation of single-phase transformer by actually loading it.
	12	the relation between back emf and Terminal voltage.		
5	13	Assignment on Torque development due to alignment of two fields & Comparison of generator and motor		
	14	Armature Reaction, Commutation methods to improve commutation	11	Checking the polarity of the windings of a three phase transformer and connecting the windings in various configurations.
	15	Performance of different types of DC motors characteristics of different types of DC motors	12	
6	16	Speed control of dc shunt motors	13	
	17	Speed control of dc series motors	14	Finding the voltage and current relationships of primary and secondary of a three-phase transformer under balanced load in various configurations conditions such as Star-star, Star delta, Delta star, Delta - Delta configuring conditions.
	18	Revision /test		
7	19	Need of starter, 4-point starter dc shunt motor		
	20	Three-point dc shunt motor starter, Applications of DC motors, Losses in a DC machine		
	21	Determination of losses by Swinburne's test		
8	22	Transformers (single phase) Introduction, Constructional features of a transformer and parts of transformer		

	23	Working principle of a transformer,EMF equation		
	24	Transformer on no-load		
9	25	Phasor diagram of Transformer		
	26	Transformer – neglecting voltage drop in the windings, Transformer – Ampere turn balance		
	27	Transformer – neglecting voltage drop inthe windings – Ampere turn balance – its phasor diagram		
10	28	Mutual and leakage fluxes, leakage reactance		
	29	Assignment on transformer, Transformer on load, voltage drops, its phasor diagram Equivalent circuit		
	30	Revision/test		
11	31	Relation between induced emf and terminal voltage		
	32	regulation of a transformer and its mathematical relation		
	33	Losses in a transformer, Open circuit and short circuit test.		
12	34	Calculation of efficiency, condition for maximum efficiency.		
	35	maintenance of Transformer, scheduled Maintenance		
	36	Auto transformer construction, Auto transformer saving of copper.		
13	37	Auto transformer working and applications		
	38	Different types of transformers including dry type transformer		
	39	Construction of three phase transformers, accessories of transformers such as Conservator, breather, Buchholz Relay, Tap Changer (off load and on load)		
14	40, 41, 42	Types of three phase transformer i.e. delta-delta, delta-star, star-delta and		
		star-star		
15	43	Conditions for parallel operation (only conditions are to be studied)		
	44, 45	Transformers three phase On load tap changer, power transformer distribution transformer		
16	46, 47, 48	Revision Class		

Name of the Faculty	Ms RITIKA ARORA
Discipline	Electrical Engineering
Semester	3rd Semester
Subject	Electrical and Electronics Engineering Materials
Lesson Plan Duration	15-16 Week

Week	**Theory**		**Practical**	
	Lecture Day	**Topic (including assignment / test)**	**Day**	**Topic**
1	1	Classification of materials into conducting, Semi conducting		
	2	Insulating materials.Atomic theory, Energy band theory. Classifications of materials on the basis of atomic structure and energy bands. Characteristics of materials.		
2	3	Types of conducting material such as low resistivity and high resistivity materials.		
3	4,5	Properties and applications of different low resistivity materials such as silver, Gold, copper (hard drawn, annealed copper), aluminum, steel, ACSR and its alloys like copper alloy (brass, bronze) etc.		
4	6,7	Properties and applications of different high resistivity material such as carbon, tungsten, platinum, mercury, lead, and its alloys like Constantan or eureka, Brass phosphor bronze, nichrome, manganin, tin-lead alloy etc.		
5	8	Semi-conductors Materials and their Applications,		
	9	Commonly used semiconducting material Germanium and silicon and their properties. Types of Semiconductors etc.		
6	10	Characteristics of good Insulating material, Electrical, thermal, chemical, visual, mechanical		
	11	Physical properties of Insulating materials. Types of Insulating materials. classification of insulating material on the basis of temperature		
7	12	Gaseous Insulating Materials: Properties and applications of air, nitrogen and Sulphur hexafluoride (SF-6) gases		
	13	Liquid Insulating Materials: Properties and applications of Mineral and Insulating oil for transformers (mineral oil), switchgears, synthetic insulating liquid (Pyranol).		
8	14	Solid Insulating Materials: Properties, types and applications of Plastics such as polyvinyl chloride (PVC), Polyethylene, polystyrene, epoxy resin, Bakelite, Melamine, silicon resins		
	15	Natural Insulating materials, properties and their applications: Mica, asbestos, ceramic materials (porcelain and steatite)		
9	16	Glass, Cotton, Silk, Jute, Paper (dry and impregnated) Rubber, Bitumen		
	17	Teflon, Silicon Grease, Insulating varnishes for coating and impregnation, Enamels for winding wires, wood		
10	18	Characteristics and types of magnetic material, Properties of soft magnet material like Iron silicon alloy		
11	19,20	Nickel iron alloy, Mu metal, soft ferrites, grain orientation, cold rolled grain-oriented silicon steels (C.R.G.O) etc. and their applications		
12	21,22	Properties of hard magnet material like Tungsten steel alloy, chromium steel, cobalt steel, Hard ferrites etc. and their applications.		
13	23	Cobalt steel, Hard ferrites etc. and their applications.		
	24	Thermocouples, Bimetals, soldering, fuse, materials and their applications		
14	25	Material used in fabrications of electrical machines such as motors		
	26	Generators, transformers		
15	27	Class Test		
	28,29	Problems, Doubts & their solution		
16	30,31,32	Revision of important topics		

Name of the Faculty	Mr VIKRAM SINGH
Discipline	Electrical Engineering
Semester	3rd Semester
Subject	Electrical Measurement & Instrumentation
Lesson Plan Duration	15-16 Week

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Day	Topic
1	1	Significance of measurement, errors in measurement, types of error	1	Use of analog and digital multimeter for measurement of voltage, current (A.C/D.C) and resistance
	2,3	Classification of measuring instruments: indicating, recording, and integrating instruments; Essential requirements of an indicating instrument.	2	To measure the value of earth resistance using earth tester.
2	4	Concept of Ammeter, voltmeter, ammeter construction, working principle	3	To measure power, power factor in a single-phase circuit, using wattmeter and power factor meter and to verify results with calculations.
	5,6	Merits, demerits and comparison of moving coil, moving iron meter, rectifier type	4	Measurement of power and power factor of a three-phase balanced load by two wattmeter method.
3	7,8	Extension of range and calibration of voltmeter and ammeter, Errors and compensation	5	Measurement of voltage and frequency of a sinusoidal signal using CRO and draw wave shape of signal.
	9	Construction, working principle, merits and demerits of dynamometer wattmeter	6	Measurement of power in a 3-phase circuit using CT, PT and 3-phase wattmeter.
4	10	Digital wattmeter, Active and reactive power measurement by , two and three wattmeter method.	7	Use of LCR meter for measuring inductance, capacitance and resistance.
	11, 12	Effect of Power factor on wattmeter reading in two wattmeter method, Maximum Demand indicator	8	To record all electrical quantities from the meters installed in the institution premises
5	13, 14, 15	Construction, working principle, merits and demerits of single-phase and three-phase energy meters (Induction type), Errors and their compensations	9	To measure Energy at different Loads using Single Phase Digital Energy meter.
6	16	Calibration of energy meter using direct loading	10	Calibration of single phase and three-phase energy meter.
	17, 18	Digital energy meter (diagram, construction and application)	11	Measurement of pressure by using LVDT.
7	19, 20,21	Construction, working principle and application of Meggar, Earth tester (analog and digital), multi- meter (analog and digital), Frequency meter (dynamometer type), single power factor meter (Electrodynamometer type)	12	To measure temperature using a thermo-couple
8	22	Working principle of synchroscope and phase sequence indicator, tong tester (Clamp-on meter)	13	Measurement of temperature by using thermistor/Thermal Imager.
	23	Study of LCR meters and their applications	14	To measure the strain using electrical strain gauge
	24	Construction, working and applications of CT and PT	15	To measure the pH level using pH meter.

9	25, 26	Cathode Ray Oscilloscope: Block diagram, working principle of CRO and its various controls, Digital Storage Oscilloscope (DSO)		
	27	Introduction, Types of Transducers		
10	28, 29	Construction and principle of resistive transducer-Potentiometer–variac and strain gauges -No derivation		
11	30, 31	Only definition and formula for gauge factor, Types of strain gauges like unbonded, bonded and semiconductor		
12	32, 33	Construction and principle of Inductive transducers-L.V.D.T. and R.V.D.T, their applications.		
13	34.35	Construction, principle and applications of transducers – Piezoelectric transducer, photo-conductive cells, photo voltaic cells.		
14	36, 37, 38	Temperature measurement - Construction and Working of RTD, Thermistor and Thermocouple, radiation pyrometer, technical specifications and ranges. Thermal Imager Camera (Concept)		
15	39, 40	Pressure measurement – Construction and working of bourdon tube, bellow diaphragm strain gauge. Measurement of pH Level.		
16	41- 45	Revision of important topics		

Name of the Faculty	Dr SUNITA
Discipline	Electrical Engineering
Semester	3rd Semester
Subject	Analog and Digital Electronics
Lesson Plan Duration	15-16 Week

Week	Theory		Practical	
	Lecture	Topic (including assignment / test)	Day	Topic
1	1,2	Concept of insulators, conductors and semiconductors	1	To Plot V-I characteristics of a PN junction diode, To Plot V-I characteristics of a Zener diode, Observe the output of waveform:
	3	Intrinsic and extrinsic semiconductor	2	Half-wave rectifier circuit using one diode, Full-wave rectifier circuit using two diodes
2	4,5	P and N type semiconductor and their conductivity	3	Observe the output of waveform of Bridge-rectifier circuit using four diodes.
	6	Effect of temperature on conductivity of intrinsic semiconductor	4	Plotting of input and output characteristics and calculation of parameters of transistors in CE configuration.,
3	7,8,9	PN junction diode, mechanism of current flow in PN junction	5	Plotting of input and output characteristics and calculation of parameters of transistors in CB configuration
4	10	Forward and reverse biased PN junction, potential barrier	6	To study weighing machine using load cell
	11,12	Drift and diffusion currents, depletion layer	7	Plotting of V-I characteristics of a FET
5	13	V-I characteristics of diodes	8	Basic logic operations of AND, OR, NOT gates
	14,15	Diode as half-wave, full wave and bridge rectifiers, Peak Inverse Voltage, rectification efficiencies and ripple factor calculations	9	Verification of truth tables for NAND, NOR and Exclusive OR (EX-OR) and Exclusive NOR (EX-NOR) gates
6	16	Concept of filters,	10	Realization of logic functions with the help of NAND or NOR gates.
7	17	Types of diodes, characteristics and applications of Zener diodes	11	To design a half adder using XOR and NAND gates and verification of its operations.
	18,19	Concept of a bipolar transistor, PNP and NPN transistors, CB, CE, CC configurations of a transistor	12	Construction of a full adder circuit using XOR and NAND gates and verify its operation
8	20,21,22	Transistor as an amplifier in CE Configuration, Current amplification factors, Comparison of CB, CE and CC Configurations	13	Verification of truth table for IC flip-flops (At least one IC each of D latch, D flip-flop, JK flip-flops)
			14	Verification of truth table for encoder and decoder ICs.
9	23,24,25	Construction, operation and characteristics of FETs, FET as an amplifier	15	Verification of truth table for Mux and De-Mux
10	26,27	Construction, operation and characteristics of a MOSFET, Comparison of JFET, MOSFET and BJT		
	28	Distinction between analog and digital signal.		
11	29	Decimal, Binary, octal and hexadecimal number system		
	30,31	Conversion from decimal and hexadecimal to binary and vice-versa, Binary addition and subtraction		
12	32,33,34	Sequential Circuits such as Half adder, Full adder		
13	35,36	Mux, De-Mux, Encoder and Decoder		
	37	Combinational Circuits like Latch, Flip Flops		
14	38,39	shift registers and counters		
	40,41	A/D and D/A Converters and its Applications		
15	42-45	Revision of important topics		

Name of the Faculty	Mr Mandeep
Discipline	Electrical Engineering
Semester	3rd Semester
Subject	Electrical Engineering Drawing
Lesson Plan Duration	15-16 Week

Practical Day	Topic
1	Unit 1 : Electrical Symbols used in Electrical installation
2	Drawing sheet1: Design and Drawing of panels/Distribution board using MCB, ELCB main switches and change over switches
3	Drawing sheet2: Design and Drawing of panels/Distribution board using MCB, ELCB main switches and change over switches
4	Unit 2 : DOL starting of 3-phase induction motor
5	3-phase induction motor getting supply from selected feeder
6	Forwarding/reversing of a 3-phase induction motor
7	Two speed control of 3-phase induction motor
8	Sequential operating of two motors using time delay relay
9	Manually generated star delta starter for 3-phase induction motor
10	Automatic star delta starter for 3-phase Induction Motor
11	Draw the wiring diagram of battery and inverter connected to residential load.
12	Draw the wiring diagram of standalone solar light system with battery for a residential house
13	Draw the wiring diagram of solar water heating system.
14	Key diagram of 11kV, 33kV
15	Key diagram of 66kV sub-stations
16	Key diagram of 132 kV sub-stations
17	Draw pipe Earthling.
18	Draw plate Earthling.
19	Bus bar post.
20	Kit Kat Fuse.
21	Pin type insulator (Pin Type 11kV)
22	Pin type insulator (Pin Type 66kV)
23	Rotor of a squirrel cage induction motor
24	Stator of 3 phase Induction motor (Sectional View)
25	Revision
26	Revision
27	Revision
28	Revision

Name of the Faculty	Ms RITIKA ARORA
Discipline	Electrical Engineering
Semester	1st Semester
Subject	Principle of Electrical Engineering
Lesson Plan Duration	15-16 Week

Week	Theory		Practical	
	Lecture	Topic	Day	Topic
1	1	Introduction, Nature of Electricity, Electric current,	1	Familiarization of basic components/equipment like ammeter, voltmeter, watt meter, resistance, capacitor, inductor, energy meter, power factor meter, CRO, multi-meter etc, and their operation, uses .
	2	Electrical Energy, Electrical power and their unit.	2	Determine the value of resistance using colour coding method.
2	3	Resistance, conductivity and resistivity, resistance properties.	3	Observation of change in resistance of a bulb in hot and cold conditions, using voltmeter, and ammeter
	4	Rating and wattages of Electrical appliances, heating effect of Electrical current.	4	To charge and discharge a capacitor and to show the graph on C.R.O.
3	5,6	Introduction to Capacitors, capacitance, Variable capacitor, Factors affecting capacitance of a capacitor and its various connections.	5	Verification of laws of capacitors in series and parallel.
4	7	Factors affecting capacitance of a capacitor and its various connections.	6	To verify ohm's law by drawing a graph between voltage and current
	8	Energy stored in capacitor, Charging and discharging of a capacitor.	7	Verification of Kirchhoff's Current Law in a dc circuit.
5	9	Charging and discharging of a capacitor.	8	Verification of Kirchhoff's Current Law in a dc circuit.
	10	Ohm's law with practical implementation.	9	Verification of Kirchhoff's Voltage Laws in a dc circuit.
6	11	Definition of DC circuit, types of DC circuits	10	Measurement of current and voltage in series resistive circuit. Measurement of current and voltage in parallel resistive circuit.
	12	Concept of voltage source & current source, connections and their conversions.	11	Measurement of current and voltage in series resistive circuit. Measurement of current and voltage in parallel resistive circuit.
7	13	Concept of voltage source & current source, connections and their conversions.	12	To find the ratio of inductance of a coil having air-core and iron-core respectively and to observe the effect of introduction of a magnetic core on coil inductance.
	14	Wheatstone Bridge.	13	To find the ratio of inductance of a coil having air-core and iron-core respectively and to observe the effect of introduction of a magnetic core on coil inductance.
8	15	Kirchhoff's Laws-KVL and KCL.	14	Verification of Faraday's law of electromagnetic induction
	16	Star – Delta connections and their conversion.	15	To obtain BH curve of a magnetic material
9	17	UNIT III Electrostatics & Magneto statics	16	Demonstration of parts of a battery and find the specific gravity of battery,
	18	Concepts of Electrostatics, Coulomb's law.	17	Demonstration of charging and discharging of Battery and measure the terminal voltage
10	19	Concept of magnetism, Magnetic field, Magnetic lines of force	18	During charging and discharging condition.
	20	Magnetic effect of electric current, direction of magnetic field and current.		
11	21	Analogy between electric and magnetic circuit.		
	22	Determination of Ampere Turns, Series & parallel magnetic circuits,		
12	23	Faraday's laws of electro-magnetic induction.		
	24	E.M.F induced in a conductor.		

13	25	UNIT V Batteries		
	26	Charging methods of storage battery and charging indications. Characteristics of battery,		
14	27	Introduction to maintenance free batteries.		
	28	Disposal of batteries		
15	29	Revision of Unit 1		
	30	Revision of Unit 2		
16	31,32	Revision of Unit 3,4		