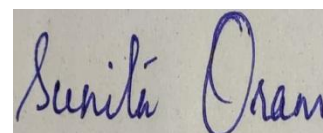


ACADEMIC LESSON PLAN OF SUMMER 2026

Discipline: ELECTRICAL	Semester: 4 th Sem	Name of the Teaching Faculty: SUNITA ORAM
Subject: ELECTRIC POWER TRANSMISSION AND DISTRIBUTION (TH:2)	No. of days/per week class allotted:3p/w week	Semester from: 22 th December 2025 to 18 th April 2026
Week	Class Day	Theory Topics
1 st	1 st	1.1 Single line diagrams with components of the electric supply transmission and distribution systems
	2 nd	1.2 Classification of transmission lines
	3 rd	1.3 Primary and secondary transmission
2 nd	1 st	1.4 Standard voltage level used in India
	2 nd	1.5 Classification of transmission lines: based on type of voltage, voltage level, length and others
	3 rd	1.6 Characteristics of high voltage for power transmission
3 rd	1 st	1.7 Method of construction of electric supply transmission system- 110 kV, 220 kV, 400 kV
	2 nd	1.8 Method of construction of electric supply distribution systems- 220 V, 400V, 11 kV, 33 kV
	3 rd	2.1 Line Parameters: Concepts of R, L and C of line parameters and types of lines
4 th	1 st	2.1 Line Parameters: Concepts of R, L and C of line parameters and types of lines
	2 nd	2.2 Performance of short line: Efficiency, regulation and its derivation, effect of power factor, vector diagram for different power factor
	3 rd	2.2 Performance of short line: Efficiency, regulation and its derivation, effect of power factor, vector diagram for different power factor
5 th	1 st	2.3 Performance of medium line: representation, nominal 'T', nominal 'π' and end condenser methods
	2 nd	2.3 Performance of medium line: representation, nominal 'T', nominal 'π' and end condenser methods
	3 rd	2.4 Transposition of conductors and its necessity
6 th	1 st	2.5 Skin effect and proximity effect
	2 nd	3.1 Extra High Voltage AC (EHVAC) transmission line: Necessity, high voltage substation components such as transformers and other switchgears
	3 rd	3.1 Extra High Voltage AC (EHVAC) transmission line: Necessity, high voltage substation components such as transformers and other switchgears
7 th	1 st	3.1.1 Advantages, limitations and applications of EHVAC 3.1.2 EHVAC lines in India
	2 nd	3.2 Ferranti and Corona effect
	3 rd	3.3 High Voltage DC (HVDC) Transmission Line: Necessity components, advantages, limitations and applications
8 th	1 st	3.3.1 Layout of monopolar, bi-Polar and homo-polar transmission lines of HVDC
	2 nd	3.3.1 Layout of monopolar, bi-Polar and homo-polar transmission lines of HVDC
	3 rd	3.3.2 HVDC Lines in India
9 th	1 st	3.4 Features of EHVAC and HVDC transmission line
	2 nd	3.5 Flexible AC Transmission line: Features, types of FACTS controller
	3 rd	3.5 Flexible AC Transmission line: Features, types of FACTS controller
10 th	1 st	3.6 New trends in wireless transmission of electrical power
	1 st	4.1 AC distribution: Components classification, requirements of an ideal distribution system, primary and secondary distribution
	2 nd	4.1 AC distribution: Components classification, requirements of an ideal distribution system, primary and secondary distribution

	3 rd	4.2 Feeder and distributor, factors to be considered in design of feeder and distributor
11 th	1 st	4.3 Types of different distribution schemes: radial, ring, and grid, layout, advantages, disadvantages and applications
	2 nd	4.3 Types of different distribution schemes: radial, ring, and grid, layout, advantages, disadvantages and applications
	3 rd	4.4 Voltage drop, sending end and receiving end voltage
12 th	1 st	4.5 Distribution Sub-Station: Classification, site selection, advantages, disadvantages and applications system
	2 nd	4.5 Distribution Sub-Station: Classification, site selection, advantages, disadvantages and applications system
	3 rd	4.6 Single Line diagram (layout) of 33/11KV Sub-Station, 11KV/400V sub-station
13 th	1 st	4.7 Symbols and functions of their components
	2 nd	5.1 Overhead Conductors: Properties of material, types of conductors with trade names, significance of sag
	3 rd	5.2 Line supports: Requirements, types of line structures and their specifications, methods of erection
14 th	1 st	5.2 Line supports: Requirements, types of line structures and their specifications, methods of erection
	2 nd	5.3 Line Insulators 5.3.1 Properties of insulating material 5.3.2 Selection of material 5.3.3 Types of insulators and their applications
	3 rd	5.3.4 Causes of insulator failure 5.3.5 Derivation of equation of string efficiency for string of three suspension insulator
15 th	1 st	5.3.6 Methods of improving string efficiency
	2 nd	5.4 Underground Cables: Requirements, classification, construction, comparison with overhead lines, cable laying and cable jointing.
	3 rd	5.4 Underground Cables: Requirements, classification, construction, comparison with overhead lines, cable laying and cable jointing.



Signature of Teaching Faculty

Discipline: ELECTRICAL	Semester: 4 th Sem	Name of the Teaching Faculty: SUNITA ORAM
Subject: AC MACHINES AND SPECIAL ELECTRICAL MACHINES (TH:3)	No. of days/per week class allotted:3p/w week	Semester from: 22 th December 2025 to 18 th April 2026
Week	Class Day	Theory Topics
1 st	1 st	1.1 Working principle: production of rotating magnetic field, Synchronous speed, rotor speed and slip
	2 nd	1.1 Working principle: production of rotating magnetic field, Synchronous speed, rotor speed and slip
	3 rd	1.2 Constructional details of 3 phase induction motors: Squirrel cage induction motor and Slip ring induction motor
2 nd	1 st	1.2 Constructional details of 3 phase induction motors: Squirrel cage induction motor and Slip ring induction motor
	2 nd	1.3 Rotor quantities: frequency, induced emf, power factor at starting and running condition
	3 rd	1.4 Characteristics of torque versus slip (speed), Torques: starting, full load and maximum with relations among them(numericals)
3 rd	1 st	1.4 Characteristics of torque versus slip (speed), Torques: starting, full load and maximum with relations among them(numericals)
	2 nd	1.5 Induction motor as a generalized transformer with phasor diagram
	3 rd	1.6 Four quadrant operation, Power flow diagram(numericals)
4 th	1 st	1.6 Four quadrant operation, Power flow diagram(numericals)
	2 nd	1.7 Starters: need and types; stator resistance, auto transformer, star delta, rotor resistance and soft starters
	3 rd	1.7 Starters: need and types; stator resistance, auto transformer, star delta, rotor resistance and soft starters
5 th	1 st	1.8 Speed control methods: stator voltage, pole changing, rotor resistance and VVVF
	2 nd	1.8 Speed control methods: stator voltage, pole changing, rotor resistance and VVVF
	3 rd	1.9 Motor selection for different applications as per the load torque-speed requirements 1.10 Maintenance of three phase induction motors
6 th	1 st	2.1 Double field revolving theory.
	2 nd	2.2 Principle of making single phase induction motors self-start
	3 rd	2.3 Construction and working & Torque-speed characteristics of Resistance start induction run, Capacitor start induction run Motor.
7 th	1 st	2.3 Construction and working & Torque-speed characteristics of Capacitor start capacitor run motor & Shaded pole motor.
	2 nd	2.3 Construction and working & Torque-speed characteristics of Repulsion type & Series motor
	3 rd	2.3 Construction and working & Torque-speed characteristics of Universal motor & Hysteresis motor
8 th	1 st	2.5 Motor selection for different applications as per the load torque- speed requirements 2.6 Maintenance of single-phase induction motors
	2 nd	3.1 Principle of working, moving and stationary armatures
	3 rd	3.2 Constructional details: parts and their functions 3.2.1 Rotor constructions 3.2.2 Windings: Single and Double layer
9 th	1 st	3.3 E.M.F. equation of an Alternator with numerical by considering short pitch factor and distribution factor

	2 nd	3.3 E.M.F. equation of an Alternator with numerical by considering short pitch factor and distribution factor
	3 rd	3.4 Alternator loading
10 th	1 st	3.4.1 Factors affecting the terminal voltage of alternator 3.4.2 Armature resistance and leakage reactance drops.
	2 nd	3.5 Armature reaction at various power factors and synchronous impedance
	3 rd	3.6 Voltage regulation: direct loading and synchronous impedance methods
11 th	1 st	3.6 Voltage regulation: direct loading and synchronous impedance methods
	2 nd	3.7 Maintenance of alternators
	3 rd	4.1 Principle of working /operation, significance of load angle.
12 th	1 st	4.2 Torques: starting torque, running torque, pull in torque, pull out torque
	2 nd	4.2 Torques: starting torque, running torque, pull in torque, pull out torque
	3 rd	4.3 Synchronous motor on load with constant excitation (numerical), effect of excitation at constant load (numerical)
13 th	1 st	4.3 Synchronous motor on load with constant excitation (numerical), effect of excitation at constant load (numerical)
	2 nd	4.4 Curves and Inverted V-Curves.
	3 rd	4.5 Hunting and Phase swinging.
14 th	1 st	4.6 Methods of Starting of Synchronous Motor
	2 nd	4.7 Losses in synchronous motors and efficiency (no numerical). 4.8 Applications areas
	3 rd	5.1 Construction and working, Torque speed characteristics & Applications of Synchronous Reluctance Motor & Switched Reluctance Motor.
15 th	1 st	Construction and working, Torque speed characteristics & Applications of BLDC Permanent Magnet Synchronous Motors.
	2 nd	Construction and working, Torque speed characteristics & Applications of Stepper motors.
	3 rd	Construction and working, Torque speed characteristics & Applications of AC and DC servomotors.

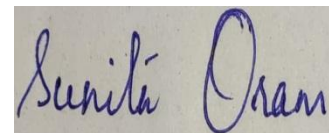
Signature of Teaching Faculty

ACADEMIC LESSON PLAN OF SUMMER 2026

Discipline: Electrical Engg.	Semester: 6 th (SEC-A)	Name of the Teaching Faculty: Sunita Oram
Subject: (SWITCH GEAR AND PROTECTIVE DEVICE)	No. of days/per week class allotted: 4p/week Tutorial:1p/week	Semester from: 22 th December 2025 to 18 th April 2025
Week	Class Day	Theory Topics
1 st	1 st	1. INTRODUCTION TO SWITCHGEAR 1.1 Essential Features of switchgear. 1.2 Switchgear Equipment.
	2 nd	1.3 Bus-Bar Arrangement.
	3 rd	1.4 Switchgear Accommodation.
	4 th	1.5 Short Circuit.
	5 th	Tutorial Period
2 nd	1 st	1.6 Short circuit
	2 nd	1.7 Faults in a power system
	3 rd	2. FAULT CALCULATION 2.1 Symmetrical faults on 3-phase system.(Contd.)
	4 th	2.1 Symmetrical faults on 3-phase system.
	5 th	2.2 Limitation of fault current.
3 rd	1 st	Tutorial Period
	2 nd	2.3 Percentage Reactance. 2.4 Percentage Reactance and Base KVA.(Contd.)
	3 rd	2.4 Percentage Reactance and Base KVA.
	4 th	2.5 Short – circuit KVA
	5 th	Tutorial Period
4 th	1 st	2.6 Reactor control of short circuit currents.
	2 nd	2.7 Location of reactors.
	3 rd	2.8 Steps for symmetrical Fault calculations. 2.9 Solve numerical problems on symmetrical fault.(Contd.)
	4 th	2.9 Solve numerical problems on symmetrical fault.
	5 th	Tutorial Period
5 th	1 st	3. FUSES 3.1 Desirable characteristics of fuse element. 3.2 Fuse Element materials.
	2 nd	3.3 Types of Fuses and important terms used for fuses.
	3 rd	3.4 Low and High voltage fuses.(Contd.)
	4 th	3.4 Low and High voltage fuses.
	5 th	Tutorial Period
6 th	1 st	3.5 Current carrying capacity of fuse element.
	2 nd	3.6 Difference Between a Fuse and Circuit Breaker.
	3 rd	4. CIRCUIT BREAKERS 4.1 Definition and principle of Circuit Breaker.
	4 th	4.2 Arc phenomenon and principle of Arc Extinction. 4.3 Methods of Arc Extinction. 4.4 Definitions of Arc voltage, Re-striking voltage and Recovery voltage.
	5 th	Tutorial Period
7 th	1 st	4.5 Classification of circuit Breakers. 4.6 Oil circuit Breaker and its classification. 4.7 Plain brake oil circuit breaker.
	2 nd	4.8 Arc control oil circuit breaker.4.9 Low oil circuit breaker. 4.10 Maintenance of oil circuit breaker.

	3 rd	4.11 Air-Blast circuit breaker and its classification.
	4 th	Tutorial Period
	5 th	4.12 Sulphur Hexa-fluoride (SF6) circuit breaker.4.13 Vacuum circuit breakers.
8 th	1 st	4.14 Switchgear component.4.15 Problems of circuit interruption
	2 nd	4.16 Resistance switching. 4.17 Circuit Breaker Rating.
	3 rd	Tutorial Period
	4 th	5. PROTECTIVE RELAYS 5.1 Definition of Protective Relay.5.2 Fundamental requirement of protective relay.
	5 th	5.3 Basic Relay operation,5.3.1 Electromagnetic Attraction type 5.3.2 Induction type
9 th	1 st	Tutorial Period
	2 nd	5.4 Definition of following important terms 5.5 Definition of following important terms
	3 rd	5.5.1 Pick-up current.5.5.2 Current setting
	4 th	5.5.3 Plug setting Multiplier. 5.5.4 Time setting Multiplier.
	5 th	5.6 Classification of functional relays 5.7 Induction type over current relay (Non-directional)
10 th	1 st	Tutorial Period
	2 nd	5.8 Induction type directional power relay.5.9 Induction type directional over current relay.
	3 rd	5.10 Differential relay 5.10.1 Current differential relay 5.10.2 Voltage balance differential relay
	4 th	5.11 Types of protection
	5 th	Tutorial Period
11 th	1 st	6. PROTECTION OF ELECTRICAL POWER EQUIPMENT AND LINES 6.1 Protection of alternator. 6.2 Differential protection of alternators.
	2 nd	6.3 Balanced earth fault protection.
	3 rd	6.4 Protection systems for transformer. 6.5 Buchholz relay.
	4 th	6.6 Protection of Bus bar. 6.7 Protection of Transmission line.
	5 th	Tutorial Period
12 th	1 st	6.8 Different pilot wire protection (Merz-price voltage Balance system)
	2 nd	6.9 Explain protection of feeder by over current and earth fault relay.
	3 rd	7. PROTECTION AGAINST OVER VOLTAGE AND LIGHTING 7.1 Voltage surge and causes of over voltage. 7.2 Internal cause of over voltage.
	4 th	7.3 External cause of over voltage (lighting)
	5 th	Tutorial Period
13 th	1 st	7.4 Mechanism of lightning discharge.(Contd.)
	2 nd	7.5 Types of lightning strokes.
	3 rd	7.6 Harmful effect of lightning. 7.7 Lightning arresters and Type of lightning Arresters.
	4 th	7.7.1 Rod-gap lightning arrester 7.7.2 Horn-gap arrester
	5 th	Tutorial Period

14 th	1 st	7.7.3 Valve type arrester.
	2 nd	7.8 Surge Absorber
	3 rd	8. STATIC RELAY 8.1 Advantage of static relay.(Contd.)
	4 th	8.1 Advantage of static relay.
	5 th	Tutorial Period
15 th	1 st	8.2 Instantaneous over current relay.(Contd.)
	2 nd	8.2 Instantaneous over current relay.
	3 rd	8.3 Principle of IDMT relay.(Contd.)
	4 th	8.3 Principle of IDMT relay.
	5 th	Tutorial Period



Signature of Teaching Faculty