

lesson Plan

Name of the Faculty : **Ms. Parul Trake**
Discipline : **Electrical Engineering**
Semester : **2nd Semester**
Subject : **NON-CONVENTIONAL ENERGY SOURCES**
Lesson Plan Duration : **14-15 Week**

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
1	1	Classification of Energy-primary and secondary energy,	1	Visit the website of Ministry of New and Renewable Energy Sources and prepare the Datasheet of Potential, Present and Future Scenario of Renewable energy sources in India.
2	2	Commercial and non- commercial energy	2	. Familiarization with the different components used in solar PV plant (standalone and grid connected system), solar water heating system, solar cooker, solar lighting etc.
3, 4, 5		Importance of non conventional energy sources, present scenario, future prospectus, energy scenario in India	3	Calculate power flow of a stand-alone PV system with DC load, AC load and battery.
6, 7		Sector-wise energy consumption	4	To demonstrate "I-V Characteristics and Efficiency of 1kWp Solar PV System" with varying radiation and temperature level.
8, 9		Principle of conversion of solar radiation into heat,	5	Assemble the components of solar home lighting system & study the system
10, 11, 12		Photo-voltaic cell, electricity generation	6	Assemble the components of solar water heating system system & study the system.

	13, 14	Application of solar energy like solar water heaters, solar furnaces, solar cookers, solar lighting, solar pumping.	7	Identify Troubleshoot solar PV panel, inverter and solar smart metering system.
	15	Bio-mass conversion technologies- wet and dry processes.	8	Identify the specified components of a 1 KW Small Wind Turbine (SWT) system and study them.
	16	Methods for obtaining energy from biomass.	9	Estimation of wind speed using anemometer.
	17	Power generation by using gasifiers	10	Study of charging and discharging behavior of a capacitor.
	18	Wind energy conversion	11	Study of charging characteristics of a Ni-Cd battery using solar photovoltaic panel.
	19	Windmills	12	Identify the prime mover /turbines used in different renewable energy sources for power generation and study them.
	20, 21	Electricity generation from wind- types of wind mills,	13	Study the Performance of fuel cell.
	22	Local control, energy storage	14	Identify the routine maintenance parts of the micro hydro power plant after watching a video.
	23	Geo-thermal sources		
	24	Ocean thermal electric conversion		
	25	Open and closed cycles		
	26	Hybrid cycles		
	27, 28	Prime movers for geo-thermal energy conversion.		
	29	Steam Generation		
	30, 31	Electricity generation		
	32, 33	Magneto Hydro Dynamic (MHD) Power Generation		
	34, 35	Design and operating principles of a fuel cell		
	36, 37	Conversion efficiency		
	38, 39	Work output and e.m.f of fuel cells,		
	40, 41, 42	Applications		

	43, 44, 45, 46	Hydro Energy – Mini & Micro hydro plants		
	47, 48	Need of energy storage, Different modes of energy storage, Flywheel storage, Super capacitor. Comparison and application.		
	49	Superconducting Magnet Energy Storage (SMES) systems, Capacitor, battery,		
	50	Super capacitor. Comparison and application.		
	51	Revision of important topics		

Lesson Plan

Name of the Faculty : Ms. Sharmila

Discipline : Electrical Engineering

Semester : 2nd Semester

Subject : Electrical Network

Lesson Plan Duration : 14-15 Week

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
1		Mesh analysis Nodal analysis using voltage and current sources	1	Use voltmeter, ammeter to determine current through the given branch of a electric network by applying mesh analysis.
2		Superposition theorem Thevenin theorem	2	Use voltmeter, ammeter to determine current through the given branch of a electric network by applying node analysis.
3, 4		Norton theorem Maximum power transfer theorem	3	Verification of Superposition Theorem. Verification of Thevenin's theorem.
5, 6, 7		Active and passive network Linear and Non Linear network	4	Verification of Norton's Theorems. Verification of Maximum Power transfer Theorem.
8, 9, 10		Generation of alternating Voltage and current. Difference between ac and dc, Equation of alternating quantity.	5	Measure input current, power, power factor of R-L series circuit and draw the power triangle.
11,12, 13		AC Terminology: waveform, cycle, frequency, time period, amplitude, instantaneous value, alternation, and their important relations (time period and frequency, angular	6	Measure input current, power, power factor of R-C series circuit and draw the power triangle.

		velocity and frequency etc.)		
	14, 15	Values of alternating voltage and current: Instantaneous value, peak value average value, r.m.s. value, form factor and peak factor	7	Measure input current, power, power factor of R-L-C series circuit and draw the power triangle.
	16	Vector representation of alternating quantities.	8	Use variable frequency supply to create resonance in given series R-L-C circuit or by using variable inductor or variable capacitor.
	17, 18	Concept of phase, phase difference and phasors	9	Estimation of wind speed using anemometer.
	19, 20	Representation of electrical quantities through phasors Addition of two alternating quantities: parallelogram method, component method	10	To determine current, p.f., active, reactive and apparent power in R-C parallel A.C. circuit.
	21, 22	A.C circuit containing pure Resistance, Inductance, Capacitance with the concept of power consumed, phase Angle, inductive and capacitive reactance etc.	11	To determine current, p.f., active, reactive and apparent power for given R-L-C parallel circuit with series connection of resistor and inductor in parallel with capacitor.
	23, 24	AC series circuit: R-L, R-C, R-L-C along with the concept of phasor diagram, phase angle , Impedance, impedance triangle, power, power triangle etc.	12	Use variable frequency supply create resonance in given parallel R-L-C circuit or by using variable inductor or capacitor.
	25, 26	Concept of True power, apparent power and reactive power, Power factor and its significance, disadvantages of low power factor, cause of low power factor, improvement of power factor.	13	Verify the relationship between phase and line values of current and voltages and power in balanced and unbalanced star connected load.
	27, 28, 29	Active and reactive components of current Resonance in RLC series circuit, Quality (Q) factor	14	Verify the relationship between phase and line values of current and voltages and power in balanced and unbalanced delta connected load.

	30	Concept of AC parallel circuit		
	31, 32	Methods of solving parallel AC circuit: vector method, admittance method, symbolic or J-method		
	33	Parallel Resonance, Q-factor		
	34	Comparison of series and parallel resonance.		
	35, 36	Introduction to transient and Harmonics in A.C. circuits		
	37, 38	Principle of generation of 3 - ϕ alternating emf.		
	39, 40	Advantages of Polyphase circuit over single phase circuit, Phase Sequence.		
	41, 42	Types of three phase connections-Star connection and delta connection.		
	43, 44	Concept of balanced and unbalanced load.		
	45,46	Relation between phase and line quantities of star and delta connection.		
	47, 48	Revision class 1		
	49	Revision class 2		
	50	Revision class 3		
	51	Revision class 4		

Lesson Plan

Name of the Faculty : **MS. SHARMILA/ Ms. Parul Trake**

Discipline : **Electrical Engineering**

Semester : **4th Semester**

Subject : **Programming Skills**

Lesson Plan Duration : **14-15 Week**

Week	Theory		Practical	
	Lecture day	Topic	Practical Day	Topic
1		Introduction to electrical CAD interface		
2		Adding a Drawing, Create a new Drawing,		
3		insert wire,		
4		Insert a Electrical Component,		
5		Connecting a component.		
6		Introduction to MATLAB		
7		MATLAB Programming – input/output		
8		types of graphs		
9		functions, loops, structures, MATLAB Simulink.		
10		MATLAB Simulink.		
11		Different program based on matlab		
12		Graphical Programming using LabVIEW including creation of VIs		
13		subVIs,		
14		structures, arrays, clusters, charts and graphs, strings, File I/Os.		

Name of the Faculty : Visiting Faculty
Discipline : Electrical Engineering
Semester : 4th Semester
Subject : Estimating and Costing
Lesson Plan Duration : 14-15 Week

Week	Theory	
	Lecture Day	Topic
1 st	1 st	Unit-1stIntroduction Purpose of estimating and costing
	2 nd	Perfoma For Making Estimates,preparation of materials schedule,
	3 rd	Costing,price list,preparation of tender document (with 2-3 exercises),
2 nd	4 th	Net price list, market survey, overhead charges, labour charges
	5 th	Electrical point method and fixed percentage method,
	6 th	Contingency, profit.
3 rd	7 th	Types of tenders, tender notice, preparation of tender documents,
	8 th	Method of opening tender, Quotation format, comparison between tender and quotation
	9 th	Comparative statement, format comparative statement, Earnest money deposit (EMD)
	10 th	Purchase system, order supply, payment of bills.

4th	11th	Revision of Unit 1
	12th	Revision of Unit 1
5th		
	13th	Unit-2 Domestic Installation Cleat,batten,casing capping and conduit wiring,
	14th	Comparison Of Different Wiring Systems,
	15th	Selection And Design Of Wiring Schemes For particular situation (domestic and Industrial).
6th	16th	Selection accessories of wires and cables, wiring
	17th	Use Of protective devices ie.Mcb,elcb etc.
	18th	Use Of Wire-gauge and tables(to be prepared/arranged)
7th	19th	Domestic installations; description of various tests to test the wiring installation before commissioning,
	20th	StandardpracticeasperISandIErules.
	21th	Planning Circuits,sub-circuits and position of different accessories,

8th	22th	Electrical layout, preparing estimates including cost as per schedule rate pattern and actual market rate
	23th	For single story and multistory building having similar electrical load

	24th	Revision of domestic installation
9th	25th	Unit-3rd Industrial installations; Relevant IEE rules and IS standard practices,
	26th	Planning, designing and estimation of installation for single phase motors of different
	27th	Electrical Circuit Diagram, starters,
	28th	Preparation Of List Of Materials, estimating and costing exercises on workshop with single- phase,
10th	29th	3-phase motor load and the light load (3- phase supply system)
	30th	Design electrical installation scheme of factory/ small industrial unit, preparation of material scheduled and detailed estimation
	31st	Unit 4th Street lighting Installation
11th		Classification of outdoor Installation streetlight / public lighting installation
	32nd	Street light pole structure, selection of equipments, source used in street light installation
	33rd	Cables recommended types and sizes of cable
12th	34th	Control of street light installation
	35th	Design, estimation and costing of streetlight, preparation of tenders.
	36th	Revision of 4 th Unit

13 th	37 th	Unit-5th Distribution line and LT substation Transmission And Distribution Lines(overhead and underground) planning and designing of lines with differentFixtures,earthling etc. based on unit cost calculation.
	38 th	Service line connection estimate for domestic and industrial load (overhead and underground connection) from pole to energy meter
	39 th	.Service line connection estimate for domestic and industrial load (overhead and underground connection) from pole to energy meter
14 th	40 th	Types of substation
	41 th	Substation scheme and components
	42 th	Estimate of 11/0.4kV pole mounted substation upto 200kVA rating
15 th	43 rd	Earthling of substations
	44 th	REVISION UNIT-5
	45 th	REVISION UNIT-5

Lesson Plan

Name of the Faculty : Mr. Surender malik
Discipline : Electrical Engineering
Semester : 4th Semester
Subject : UTILIZATION OF ELECTRICAL ENERGY
Lesson Plan Duration : 14-15 Week

Week	Theory		Practical	
	Lecture Day	Topic(including assignment/test)	Practical Day	Topic
Week 1 st	1	Nature of light, visibility spectrum curve of relative sensitivity of human eye and wavelength of light		
	2	Definition: Luminous flux, solid angle, luminous intensity, illumination, luminous efficiency, depreciation factor, coefficient of utilization, space to height ratio, reflection factor, glare, shadow, lux.		
	3	Laws Of Illumination—simple numericals		
	4.	Different Types Of Lamps, construction and working of incandescent lamp and discharge lamp, Fittings Required For Filament Lamp		
	5.	Mercury Vapour Sodium Lamp, fluorescent lamp, Halogen lamp		

	6,7	Compact filament lamp(CFL), Calculation of number of light points for interior illumination,calculation of illumination at different points, considerations involved in simple design problems. Illumination schemes;indoor and outdoor illumination levels		
Week 2 nd	8	Main Requirements Of Proper Lighting; absence of glare, contrast and shadow		
	9	Awareness about time switches, street lighting, flood lighting, monument lighting and decorative lighting,light characteristics etc		
	10,11	Resistance heating – direct and indirect resistance heating,electric ovens, their temperature range, properties of resistance heating elements, domestic water heaters another heating appliances, thermostat control circuit		

	12	Induction Heating;principle of core type and coreless induction furnace, their construction and applications		
	13	Electric arc heating; direct and indirect arc heating,construction, working and applications of arc furnace		

	14	<p>Dielectric Heating,applications in various industrial fields</p> <p>Infra-red heating and its applications</p> <p>(construction and working of two appliances)</p>		
	15	<p>Microwave heating and its applications(construction and working two appliances)</p>		
	16	<p>Calculation Of Resistance Heating elements (simple problems)</p>		
	17	<p>Advantages Of Electric Welding, Welding method, Principles of resistance welding, types—spot,projection,seam and butt welding,welding equipment</p>		
	18	<p>Principle of arc production, electric arc welding, characteristics of arc; carbon arc, metallic, hydrogen arc welding method and their applications. Power supply requirement. Advantages of using coated electrodes, comparison between AC and DC arc welding, welding control circuits, welding of aluminum and copper</p>		
	19	<p>Need of electro-deposition, Laws Of Electrolysis,process of electro-deposition - clearing, operation, deposition of metals,</p>		
	20	<p>polishing and buffing, Equipment And accessories for electroplating</p>		

	21	Factors affecting electro-deposition, Principle Of Galvanizing And Its applications		
	22	Principles Of Anodizing And Its applications,Electroplating Non-conductive materials		
	23	Manufacture Of Chemicals By electrolytic process,Power Supply For Electroplating		
	24	Principle Of Air Conditioning,vapour pressure, refrigeration cycle, eco- Friendly refrigerants		
	25,26	Description of Electrical circuit used in a) Refrigerator, b) Air-conditioner, and Watercooler		

	27	Advantages Of Electric Drives, Characteristics of different mechanical loads	
	28	Types Of Motors Used As Electric Drive	

	29	<p>Electric Braking</p> <p>Plugging</p> <p>Rheostatic Braking</p> <p>Regenerativebraking</p>	
	30	General idea about the methods of power transfer by direct coupling by using devices like belt drive,gears,chain drives etc.	
	31	Examples Of Selection Of Motors For Different types of domestic loads	
	32	Selection of drive for applications such a general workshop, textile mill, paper mill, steel mill, printing press, crane and lift etc. Application of flywheel.	
	33	motors, Fractional kiloWatt(FKW) motors	
	34	Selection of motors for Domestic Appliances	
	35	<p>Advantages Of Electric Traction Over other types of traction.,</p> <p>Different Systems Of Electric Traction, DC and AC systems, diesel electric system, types of services – urban,sub-urban, and mainline and their speed-time curves</p>	

	36	Different accessories for track electrification; such as overhead catenary wire, conductor rail system, current collector-pantograph	
	37	Factors Affecting Schedule Speed	
	38	Electrical Blockdiagram of a Electric locomotive with description of various equipment and accessories used.	
	39	Types Of Motors Used For Electric traction	
	40	Power Supply Arrangements	
	41	Starting And Braking Of Electric locomotives	
	42	Introduction to EMU and metro railways	
	43	TrainLightingScheme	
	44	REVISION UNIT-5	
	45	REVISION UNIT-5	

Name of Faculty	Mohd.Mohsin
Discipline	Electrical Engineering
Semester	4th Semester
Subject	Electrical Machine-II
Lesson Plan Duration	From 15^h JAN to 27th aprl
Work load [Theory + Practical] Per Week	[03]

Week	Day	Theory Topic/ Assignment/ Test
1st	1	Unit1: Synchronous Machine
	2	Construction of 3-Phase Synchronous Machine
	3	Excitation in Synchronous Machines
	4	E.M.F. Equation of Alternator
2nd	1	Generation of E.M.F.
	2	Armature Winding
	3	Voltage Generate in a Distributed Short Pitch Winding
	4	Armature Reaction and its effects

3rd	1	Equivalent Circuit and Phasor Diagram of Synchronous Generator
	2	Voltage Regulation
	3	Parallel operation
	4	Procedure of Synchronizing
4th	1	Synchronous Power and Torque
	2	Effect of change in excitation and input power
	3	Synchronous Motor: Working Principle & Equivalent Circuit
	4	Loading in Synchronous Motor
5th	1	V-Curve and Inverted V- Curve In Synchronous Motor
	2	Synchronous Condenser
	3	Starting of Synchronous Motor, Hunting in Synchronous Motor
	4	Applications of Synchronous Motors

6th	1	Revision/Problem solution
	2	Class Test/Assignment
	3	Unit 2: 3-Phase Induction Motors

	4	Classification of AC Motors
7th	1	Construction of 3 phase Induction Motor
	2	Comparison of Squirrel Cage and Wound Rotor
	3	Production of Rotating Magnetic Field
	4	Principle of operation, slip and its significance
8th	1	Similarity between Induction Motor and Transformer
	2	Equivalent Circuit of Induction Motor
	3	Torque developed in Induction Motor
	4	Condition for Maximum Starting Torque
9th	1	Relation between Full load torque, Starting Torque and Maximum Torque
	2	Torque Slip Curve
	3	Power flow diagram of an induction motor

	4	Starting of Induction Motors
10th	1	Speed Control of Induction Motors
	2	Crawling, Cogging and Skewing
	3	Applications of 3- phase Induction motor
	4	Revision/Problem solution
11th	1	Class Test/Assignment
	2	Unit 3: Single Phase Motors
	3	Single phase induction motors; Construction characteristics, specifications and applications
	4	Nature of field produced in single phase induction motor- double revolving field theory.
12th	1	Split phase induction motor
	2	Alternating current series motor and universal motors, construction,working principle and operation, application.

	3	Single phase synchronous motor: Reluctance Motor
	4	Hysteresis Motor
13th	1	Revision/Problem solution
	2	Special Purpose Machines Linear induction motor
	3	Stepper motor
	4	AC Servomotor
14th	1	Submersible Motor
	2	Revision/Problem solution
	3	Revision/Problem solution
	4	Revision/Problem solution
15th	1	Revision of Old Question Papers
	2	Revision of Old Question

	Papers
3	Revision of Old Question Papers
4	Revision of Old Question Papers
2	Revision of Old Question Papers
3	Revision of Old Question Papers
4	Revision of Old Question Papers Papers

Lesson Plan

Name of the Faculty : Visiting Faculty
Discipline : Electrical Engineering
Semester : 6th Semester
Subject : EDM
Lesson Plan Duration : 14-15 Week

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
	1	Entrepreneurship: Concept and definitions		
	2	Classification and types of entrepreneurs, entrepreneurial competencies		
	3	Traits / Qualities of entrepreneurs, manager v/s entrepreneur, role of Entrepreneur		
	4	Barriers in entrepreneurship, Sole proprietorship and partnership forms of business organisations		
	5	Small business vs startup, critical components for establishing a start-up		
	6,7	Leadership: Definition and Need, Manager Vs leader, Types of leadership		
	8	Definition of MSME (micro, small and medium enterprises)		
	9	Significant provisions of MSME Act		
	10,11	Importance of feasibility studies, technical, marketing and finance related problems faced by new enterprises		
	12,13	Major labor issues in MSMEs and its related laws, Obtaining financial assistance		
	14,15	Various government schemes like Prime Minister Employment Generation Program (PMEGP) Pradhan Mantri Mudra Yojna (PMMY) , Make in India, Start up India, Stand up India National Urban Livelihood Mission (NULM)		

	16	Technology Business Incubator (TBI) and Science and Technology Entrepreneur Parks (STEP)		
	17	NATURE AND FUNCTIONS OF MANAGEMENT: Definition, Nature of Management		
	18	Management as a Process, Management as Science and Art, Management Functions		
	19	Management and Administration, Managerial Skills, Levels of Management; Leadership		
	20	PLANNING AND DECISION MAKING: Planning and Forecasting - Meaning and definition, Features		
	21	Steps in Planning Process, Approaches, Principles, Importance		
	22	Advantages and Disadvantages of Planning, Types of Plans, Types of Planning		
	23	Management by Objective. Decision Making-Meaning, Characteristics		
	24	ORGANISING AND ORGANISATION STRUCTURE: Organising Process - Meaning and Definition		
	25	Characteristics Process, Need and Importance, Principles		
	26	Span of Management		
	27,28, 29	Organisational Chart - Types, Contents, Uses, Limitations, Factors Affecting Organisational Chart		
	30	STAFFING: Meaning, Nature, Importance		
	31, 32, 33	Staffing process. Manpower Planning, Recruitment, Selection, Orientation and Placement, Training, Remuneration		
	34	CONTROLLING AND CO-ORDINATION Controlling - Meaning, Features		
	35	Importance, Control Process		
	36, 37	Characteristics of an effective control system, Types of Control. Co-ordination -characteristics, essentials		
	38	Market Survey and Opportunity Identification		
	39, 40	Scanning of business environment, Assessment of demand and supply in potential areas of growth		

	41	Project report Preparation, Detailed project report including technical		
	42	Economic and market feasibility		
	43, 44, 45	Common errors in project report preparations, Exercises on preparation of project report		

Lesson Plan

Name of the Faculty : **Mohd. Mohsin**
Discipline : **Electrical Engineering**
Semester : **6th Semester**
Subject : **ENERGY CONSERVATION AND AUDIT**
Lesson Plan Duration : **14-15 Week**

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
1	1	Energy Scenario: Primary and Secondary Energy, Energy demand and supply	1	Identify star labelled electrical apparatus and compare the data for various star ratings
	2	Introduction to Energy conservation, energy management , energy efficiency and its need	2	Study of various instrument used for energy audit
	3	Bureau of Energy efficiency (BEE) and its Roles	3	Use APFC unit for improvement of p. f. of electrical load
	4	Star Labelling: Need and its benefits	4	Determine the reduction in power consumption by replacement of lighting system in a class room / laboratory
	5	General energy saving tips in Lighting system	5	Collect electricity bill of a residential consumer and suggest suitable means for conservation and reduction of the energy bill
	6,7,8	Energy efficiency measures in fans , water pumps, Room Air Conditioners, Refrigerators, Heaters, Blowers , Washing Machines etc	6	Prepare an energy audit report for your Institute
	9,10,11	Energy conservation in Electricity Bill: concept of Electricity billing, Maximum Demand Controller kVAR Controller , Maximum demand controllers; Automatic power factor controllers (APFC)	7	Prepare a technical report on energy conservation act 2003
	12,13	General energy saving tips for transformer and AC/DC motor	8	Prepare a technical report on Energy Conservation Building Code (ECBC)
	14,15	Energy efficient motor; significant features, advantages, applications and limitations	9	Studying the various energy conservation methods useful in power generation, transmission and distribution

	16,17, 18	Energy efficient transformers, amorphous transformers; epoxy Resin cast transformer / Dry type of transformer	10	Visit an industry and studying various energy management systems in an industry. Further identify the various energy conservation methods useful in a particular industry
	19	Energy saving factors for the selection of DG system		
	20	Energy audit : Definition, and Need of energy audit		
	21	Types of Energy audit and Instruments used for energy audit		
	22	Roles and responsibilities of energy Manager and Accountability		
	23,24	Energy Audit procedure: Techniques involved in conducting energy audits, including data collection, analysis, and evaluation of energy consumption patterns		
	25	Energy conservation Act 2001: Objectives, features and its amendments		
	26,27	Salient features of Energy Conservation Building Code (ECBC): Building Envelope, Comfort System and Controls, Lighting & Controls and Electrical & Renewable Energy Systems		
	28	Salient features of Eco Niwas Samhita Code (ENS)		

Lesson Plan

Name of the Faculty : **Ms. Poonam Saini**
Discipline : **Electrical Engineering**
Semester : **6th Semester**
Subject : **INSTALLATION AND MAINTENANCE OF ELECTRICAL EQUIPMENT**
Lesson Plan Duration : **14-15 Week**

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
1	1	Tools: Tools, accessories and instruments required for installation, maintenance and repair work. Workmen's safety devices	1	Write IE rules related to safety and demonstrate the steps taken when a person comes in contact with a live wire
2	2	Underground cable handling equipment. using fire extinguisher for safety against fire	2	Study of tools, accessories and instruments required during installation, maintenance and repair of electrical equipment
3	3	IER rules: Knowledge of Indian Electricity rules, safety codes, causes and prevention of accidents	3	Study the steps required for erection of steel structure along with connection of all accessories viz. jumpers, tee points, insulators, joints etc. during installation of a transmission line
4	4	Meaning of Authorized persons, anti-climbing devices and danger plates, caution notice	4	Measure insulation resistance of Three-phase PVC cable in a distribution board
5	5	Clearances rules for crossing of transmission and distribution line to roads, streets, power/ telecommunication lines, river and railway line	5	Study of steps required for erection of distribution line along with connection of all accessories viz. jumpers, tee points, insulators, joints etc. during installation of a distribution line.
6	6	Necessity of Maintenance, Types of maintenance	6	Study of tests done at the time of commissioning of transmission and distribution line as per IS standards
7	7	Installation of Line: Method of erection of steel structures and pole support	7	Prepare list of all electrical accessories required for installation of Pole mounted substation, Plinth mounted substation
8	8	Connection of jumpers, tee-off points, joints and dead ends. Earthing of transmission lines and guarding	8	Study of various pre-installation tests as per IS standard done on following electrical equipment viz

				Electrical motors, Electrical Generators, Transformers and Underground cables
	9	Arrangement for different types of insulators. Installation and use of Bird guards, earth wire and guy wires	9	Study of various pre-commissioning tests as per IS standard done on following electrical equipment viz Electrical motors, Electrical Generators, Transformers and Underground cables
	10	Laying of service lines, provision of service fuses, installation of energy meters	10	Prepare maintenance schedule of Power transformer
	11	Maintenance of Line: Patrolling and visual inspection of lines	11	Prepare maintenance schedule of Distribution Transformer
	12	Special inspections and night inspections	12	Prepare maintenance schedule of Motors
	13	Permit to work, arranging of shut downs personally, temporary earthing, cancellation of permit and restoration of supply		
	14	Maintenance schedule of busbars, isolating switches, Relays, circuit breakers, LT switches		
	15	Installation of Cable: Inspection, storage, transportation and handling of cables. Clearances from other department such as Municipal, Highway authorities, railway, etc		
	16	Different methods of laying cable. Introduction to Cable filling compounds, Epoxy resin and hardeners		
	17	Maintenance of Cable: Cable jointing and termination		
	18	Installation of Machine: Inspection and handling of transformers and motors		
	19	Installation of power and distribution transformers		
	20	Installation of CT and PT.		
	21	Dehydration of Transformer		
	22	Maintenance of Machine		
	23	Preventive Maintenance schedule of transformer below and above 1000KVA		
	24	Maintenance schedule of CT and PT		
	25	Preventive Maintenance schedule of motors		
	26	Over hauling of motors		

27	Trouble shooting of electric motors		
28	Testing of insulator		
29	Testing of transmission and distribution line before commissioning		
30	Testing of electrical motor		
31	Testing of transformers		

Lesson Plan

Name of the Faculty : **Ms. Sharmila**
Discipline : **Electrical Engineering**
Semester : **6th Semester**
Subject : **POWER SYSTEM PROTECTION**
Lesson Plan Duration : **14-15 Week**

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
	1,2	Common type of faults in both overhead and underground systems	1	Identify various switchgears installed in the laboratory and write their specifications
	3	Types of Symmetrical faults: Three phases to ground and Three Phase fault	2	Test HRC fuse by performing the load test
	4,5	Types of Unsymmetrical faults: Line to line fault, Single line to ground fault, double line to ground fault, Line to line and third line to ground fault	3	Perform the overload and short circuit test of MCB as per IS specifications
	6	Definition of switchgear, Purpose of switchgear	4	Plot the time-current characteristics of Kit-Kat fuse wire
	7	Function of, switch, fuse, isolator and circuit breaker	5	Perform Earthing of different equipment installed in the institute viz Motors, Generators, Energy Meter, Main Distribution Board and Energy Meter Box
	8	Difference between fuse and circuit breaker	6	Plot the time current characteristics of over current relay
	9	Circuit Breaker: Operating principle of circuit breaker. Arc phenomenon	7	To write down specifications of Lightning arrestors installed in a substation
	10,11	Methods of Arc extinction. Definition of Arc voltage, Restriking and Recovery voltage, Rate of rise of restriking voltage (RRRV)	8	Power measurement by using CTs and PTs
	12	Rating of Circuit breakers: making capacity, breaking capacity, short time capacity.	9	Measurement of current on any LT line with clip meter
	13,14, 15	Types of Circuit Breakers: Constructional and working of Oil circuit breakers, Air Blast Circuit Breaker, SF6 circuit breakers, VCB	10	Study of different types of circuit breakers and isolators by visiting power station and to prepare detailed report
	16,17	Fuses: Properties and Characteristics of fuse, Types of Fuse: HV and LV fuses, rewire-able, cartridge, HRC	11	Prepare charts on different Generating stations in our state mentioning their locations

	18,19, 20	Earthing: Purpose of earthing, method of earthing, Equipment earthing, Substation earthing, Methods of reducing earth resistance	12	Students may be taken to various Sub-stations/Grid Stations for study the differential protection of transformer
	21,22, 23	Basic relay terminology- Protective relay, Relay time, Pick up, Reset current, current setting, Plug setting multiplier, Time setting multiplier		
	24,25, 26,27	Protective relays: Classification, principle of working, construction and operation of – Electromagnetic (Attracted armature type, Induction) relay, Thermal relay. Block diagram and working of Static relay		
	28,29	Over-current relay: Principle, operation of instantaneous over current relay, Inverse definite minimum time (IDMT) over current relay		
	30	Directional over-current: operation of Directional over-current		
	31	Differential relay: operation of Differential relay		
	32	Distance relays: Impedance relay, mho relay		
	33	Protection for Alternator: Differential protection over current, Earth fault protection scheme		
	34	Protection for transformer: Buchholz protection scheme, differential protection scheme		
	35,36, 37	Protection for Feeder and transmission line - time graded and over current protection, current graded system, differential protection		
	38	Causes of over voltages: Internal and external causes, types of lightning strokes		
	39,40	Protection against Overvoltage and Lightning: ground wire, earthing screen, surge diverters or lightning arresters		
	41,42	Types of Lightning arresters: rod gap, horn gap, metal oxide type		

Lesson Plan

Name of the Faculty : Ms. Parul Trake
Discipline : Electrical Engineering
Semester : 6th Semester
Subject : Smart Grid
Lesson Plan Duration : 14-15 Week

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	P r a c t i c a l D a y	Topic
	1,2	Conventional Grid system: Introduction, Evolution of electric Grid system, Regulatory authority in Indian Power sector.		
	3,4,5	Smart Grid system: Introduction, Need of Smart Grid, Benefits of Smart Grid, Challenges of Smart Grid, Difference between Conventional Grid and Smart Grid system, Smart Grid scenario in Indian power sector		
	6,7	components of smart grid system		
	8,9	Architecture of Smart Grid		
	10,11	function of Smart Grid components		
	12,13	Introduction to Communication and Measurement Technology communication, Smart management.		

	14,15	Smart infrastructure (smart energy system and smart information system), Smart	
	16,17	Smart Meter : Advanced meter Infrastructure (AMI) function and its benefits	
	18,19,20,21	Distributed generation (DG): Concept of distributed generation's, selection of sources, regulatory standards/ framework, Standards for interconnecting Distributed resources to electric power systems: IEEE 1547.	
	22,23	Overview of Microgrid : concept and definition of microgrid	
	24,25	SCADA: Introduction to Supervisory Control and Data Acquisition System (SCADA),	
	26,27	Functional block diagram, Architecture of SCADA.	
	28,29	Smart grids application Electrical Energy Storage Technologies Function of SCADA in smart grid	
	30,31	Home Energy Management system	
	32,33	Plug in Hybrid Electric Vehicles (PHEVs)	
	34,35	Electrical Energy Storage Technologies	
	36,37	Function of SCADA in smart grid	
	38	Revision	
	39	Revision	
	40	Revision	
	41	Discuss previous paper	
	42	Discuss previous paper	