Govt. Polytechnic Sector-26, Panchkula

Electrical Engineering Department

Lesson plan

Lesson Plan				
Name of Faculty		Sh. Vikram Singh		
Discipline		ElectricalEngineering		
Semester		6th		
Subject		ElectricalPower-II		
LessonPlanDuration		W.e.f 15/01/2026 (Theory:04, Practical:03)		
Week	**Theory**		**Practical**	
	Lecture Day	**Topic (including Assignment / Test)**	**Practical Day**	**Topic**
1st	Day1	**Unit 1: Faults; Introduction**	Day 1	1. Testing of the dielectricstrength of transformer oiland air
	Day2	Common type of faults in both overhead and Underground systems		
	Day3	symmetrical/Unsymmetrical faults		
	Day4	Single line to ground fault		
2nd	Day1	Double line to groundfault,3-phase to Ground Fault open circuit	Day 2	2. Study of different types ofcircuitbreakersandisolators
	Day2	Simple problems relating to fault finding.		
	Day3	Revision of important topics		
	Day4	Assignment/Classtest		
3rd	Day1	**Unit 2: Switch Gears:** Purpose of protective gear. Difference between switch, isolator and circuit breakers	Day 3	Revision/file checking
	Day2	Function of isolator and circuit breaker. Making Capacity and breaking Capacity.		
	Day3	Capacity of circuit breaker (only definition)		
	Day4	Circuit breakers. Types of circuit breakers, Bulk and minimum oil circuit breakers.		
4th	Day1	Air, SF6 circuit breakers.	Day 4	3. Plot the time currentcharacteristics of over currentrelay
	Day2	Principles of Arc extinction blast circuit breaker s in OCB and ACB, Constructional		
	Day3	Features of OCB, ACB, and their working		
	Day4	Method of arc extinction		
5th	Day1	Miniature circuit breakers MCB, MCCB	Day 5	4. Power measurement by using CTs and PTs
	Day2	ELCB, for distribution and transmission system (Descriptive)		
	Day3	Revision of important topics		
	Day4	Assignment /Classtest		
6th	Day1	**Unit 3: Protection devices**: Fuses; function of fuse.	Day 6	Revision/filechecking
	Day2	Types of fuses HV and LV fuses,		
	Day3	Rewire-able, cartridge, HRC		
	Day4	**Earthing**: purpose of earthing, method of earthing		
7th	Day1	Equipment earthing, Substation earthing.	Day 7	5. Earthing of different equipment/ Main Distribution Board and Energy Meter Box
	Day2	System earthing as per Indian Electricity rules. Methods of reducing earth resistance.		
	Day3	**Relays**: Introduction, types of relays		
	Day4	Electromagnetic and thermal relays		
8th	Day1	Relays construction and working	Day 8	6. Perform the overload andshort circuit test of MCB as per IS specifications
	Day2	Induction type over-current, earth fault relays		
	Day3	Instantaneous, over current Relays		
	Day4	Directional over-current, differential relays, And their functions		

9th	Day1	d)Distancerelays,theirfunctions	Day 9	Revision/filechecking
	Day2	e)Ideaofstaticrelaysandtheirapplications		
	Day3	Revisionofimportanttopics		
	Day4	Assignment/Classtest		
10th	Day1	**Unit 4: Protection Scheme:** introduction	Day 10	7. Plot the time-current characteristics of Kit-Kat fuse wire
	Day2	Relays for generator protection		
	Day3	4.2 Relays for transformer protection including Buchholtz relay protection		
	Day4	4.3Protectionoffeedersand busbars		
11th	Day1	Overcurrentandearthfaultprotection.	Day 11	8. Taking reading of current onany LT line with clip onmeter
	Day2	4.4Distanceprotectionfortransmissionsystem		
	Day3	4.5Relaysfor motorprotection		
	Day4	Relaysforgeneratorprotection		
12th	Day1	Revisionofimportanttopics		
	Day2	Assignment/Classtest	Day 12	Revision/file checking
	Day3	**Unit 5: Over-voltage Protection:** Protection of System against over voltages		
	Day4	causesofover voltages,utilityofgroundwire		
13th	Day1	5.2Lightningarrestors,rodgap	Day 13	Revision/file checking
	Day2	Horngap,metal oxidetype.		
	Day3	5.3TransmissionLineprotectionagainstover-voltagesandlightning		
	Day4	substationprotectionagainstover-voltagesand lightning		
14th	Day1	Revisionofimportanttopics	Day 14	Quiz /viva-voice related toelectrical machine
	Day2	Assignment/Classtest		
	Day3	**Unit 6:Concept of Tariffs**		
	Day4	6.2 Block rate, flat rate tariff		
15th	Day1	Maximum demand and two part tariffs	Day 15	Quiz /viva-voice related toelectrical machine
	Day2	6.3 Simple problems		
	Day3	Assignment/ Class test		
	Day4	Problem solution/ test check		

Govt. Polytechnic Sector-26, Panchkula
Electrical Engineering Department
Lesson plan

Name of Faculty	Dr. Sarika Sharma		
Discipline	Electrical Engineering		
Semester	6th		
Subject	EC&A		
Lesson Plan Duration	13-14 weeks		
Theory		**Practical**	
Lecture Day	**Topic (including assignment / test)**	**Practical Week**	**Topic**
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	**Assignment-1**	6	Prepare an energy audit report for your Institute.
7	Energy efficiency measures in fans , water pumps, Room Air Conditioners, Refrigerators, Heaters, Blowers , Washing Machines etc	7	Prepare a technical report on energy conservation act 2003.
8	Energy conservation in Electricity Bill: concept of Electricity billing,	8	Prepare a technical report on Energy Conservation Building Code (ECBC).
9	General energy saving tips for transformer and AC/DC motor.	9	Studying the various energy conservation methods useful in power generation, transmission and distribution.
10	Energy efficient motor; significant features, advantages, applications and limitations	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.
11	**1st Sessionl**		
12	Energy efficient transformers, amorphous transformers; epoxy Resin cast transformer / Dry type of transformer.		
13	Energy saving factors for the selection of DG system.		
14	Energy audit : Definition, and Need of energy audit		
15	Types of Energy audit and Instruments used		

	for energy audit		
16	**Assignment-2**		
17	Roles and responsibilities of energy Manager and Accountability		
18	Energy Audit procedure: Techniques involved in conducting energy audits,		
19	Energy conservation Act 2001: Objectives, features and its amendments.		
20	Salient features of Energy Conservation Building Code (ECBC): Building Envelope,		
21	Salient features of Eco Niwas Samhita Code (ENS)		
22	**2nd Sessionl**		
23	Prepare an energy audit report for your Institute.		
24	Prepare a technical report on energy conservation act 2003.		
25	Prepare a technical report on Energy Conservation Building Code (ECBC).		
26	Studying the various energy conservation methods useful in power generation,		
27	**Assignment-3**		
28	Visit an industry and studying various energy management systems in an industry.		
29	Further identify the various energy conservation methods useful in a particular industry.		
30	Comfort System and Controls, Lighting & Controls and Electrical & Renewable Energy Systems.		
31	**3rd Sessionl**		
32	Last year question paper discussion.		

Govt. Polytechnic Sector-26, Panchkula
Electrical Engineering Department
Lesson plan

LESSON PLAN	
Name of the Faculty : Dr. Sarika Sharma	
Discipline : Electrical Engineering	
Semester : 6th Semester	
Subject : EDM	
Lesson Plan Duration : 13-14 Week	
Theory	
Lecture Day	**Topic (including assignment / test)**
1	Entrepreneurship: Concept and definitions, classification and types of entrepreneurs,
2	Entrepreneurial competencies, Traits / Qualities of entrepreneurs, manager v/s entrepreneur.
3	Barriers in entrepreneurship, Sole proprietorship and partnership forms of business organisations.
4	Small business vs startup, critical components for establishing a start up.
5	Leadership: Definition and Need, Manager Vs leader, Types of leadership.
6	Definition of MSME (micro, small and medium enterprises).
7	Significant provisions of MSME Act, importance of feasibility studies.
8	Sechnical, marketing and finance related problems faced by new enterprises.
9	Major labor issues in MSMEs and its related laws.
10	Obtaining financial assistance through various government schemes like Prime Minister Employment Generation.
11	Program (PMEGP) Pradhan Mantri Mudra Yogna (PMMY).
12	**Assignment-1**
13	Make in India, Start up India, Stand up India National Urban Livelihood Mission (NULM).
14	Schemes of assistance by entrepreneurial support agencies at National, State.
15	District level: NSIC, NRDC, DC:MSME, SIDBI, NABARD, Commercial Banks.
16	**1st Sessionl**
17	SFC's TCO, KVIB, DIC, Technology Business Incubator (TBI) and Science and Technology Entrepreneur Parks (STEP).
18	NATURE AND FUNCTIONS OF MANAGEMENT.
19	Definition, Nature of Management, Management as a Process,
20	Management and Administration, Managerial Skills, Levels of Management; Leadership.
21	PLANNING AND DECISION MAKING: Planning and Forecasting - Meaning and definition.
22	**Assignment-2**
23	Features, Steps in Planning Process, Approaches.
24	Principles, Importance, Advantages and Disadvantages of Planning, Types of Plans.
25	Types of Planning, Management by Objective.
26	ORGANISING AND ORGANISATION STRUCTURE.
27	Organising Process - Meaning and Definition, Characteristics Process.
28	Need and Importance, Principles, Span of Management, Organisational Chart - Types.
29	**2nd Sessionl**
30	Contents, Uses, Limitations, Factors Affecting Organisational Chart.
31	STAFFING: Meaning, Nature, Importance, Staffing process. Manpower Planning, Recruitment, Selection.
32	Training, Remuneration. CONTROLLING AND CO-ORDINATION Controlling - Meaning.
33	Features, Importance, Control Process, Characteristics of an effective control system.
34	Types of Control. Co ordination - characteristics, essentials.
35	Market Survey and Opportunity Identification.
36	**Assignment-3**

37	Scanning of business environment, Assessment of demand and supply in potential areas of growth.
38	Project report Preparation.
39	Detailed project report including technical.
40	Economic and market feasibility.
41	Common errors in project report preparations.
42	Exercises on preparation of project report.
43	Decision Making-Meaning, Characteristics.
44	**3rd Sessionl**
45	Last year question paper discussion.

Lesson Plan			
Faculty	**Mr. Mandip Singh**		
Discipline	**Electrical Engineering**		
Semester	**6th**		
Subject	**Installation and Maintenance of Electrical Equipment**		
Duration	**15-16 Weeks**		
Work Load per Week	**Practical - 02**		
		Theory	**PRACTICALS**
Week	**Lecture Day**	**Topic**	**Name of Practical**
I			**Introduction of the Lab**
II			1. Write IE rules related to safety and demonstrate the steps taken when a person comes in contact with a live wire.
III			2. Study of tools, accessories and instruments required during installation, maintenance and repair of electrical equipment.
IV			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.
V			4. Measure insulation resistance of Three-phase PVC cable in a distribution board.
VI			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.
VII			6. Study of tests done at the time of commissioning of transmission and distribution line as per IS standards.
VIII			7. Prepare list of all electrical accessories required for installation of Pole mounted substation, Plinth mounted substation.
IX			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.
X			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.

XI			10. Prepare maintenance schedule of Power transformer.
XII			11. Prepare maintenance schedule of Distribution Transformer.
XIII			12. Prepare maintenance schedule of Motors.
XIV			**File checking and Viva voce**
XV			**File checking and Viva voce**

Lesson Plan			
Faculty	**Mrs. Ritika Arora**		
Discipline	**Electrical Engineering**		
Semester	**6th**		
Subject	**Installation and Maintenance of Electrical Equipment**		
Work Load per Week	**Lecture – 02 ; Practical – 04**		
		Theory	**PRACTICALS**
Week	**Lecture Day**	**Topic**	**Name of Practical**
I	**1**	**Introduction of the Subject:** Installation and Maintenance of Electrical Equipment	**Introduction of the Lab**
	2	**Tools and Accessories for Installation and Maintenance** 1.1 Tools: Tools, accessories and instruments required for installation, maintenance and repair work.	
II	**1**	Workmen's safety devices. Underground cable handling equipment. using fire extinguisher for safety against fire.	1. Write IE rules related to safety and demonstrate the steps taken when a person comes in contact with a live wire.
	2	1.2 IER rules: Knowledge of Indian Electricity rules, safety codes, causes and prevention of accidents. Meaning of Authorized persons, anti-climbing devices and danger plates, caution notice.	
III	**1**	Clearances rules for crossing of transmission and distribution line to roads, streets, power/telecommunication lines, river and railway line.	2. Study of tools, accessories and instruments required during installation, maintenance and repair of electrical equipment.
	2	1.3 Necessity of Maintenance, Types of maintenance.	
IV	**1**	**Installation and maintenance of transmission and Distribution lines** 2.1 Installation of Line: Method of erection of steel structures and pole support.	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.
	2	Connection of jumpers, tee-off points, joints and dead ends. Earthing of transmission lines and guarding.	
V	**1**	Arrangement for different types of insulators. Installation and use of Bird guards, earth wire and guy wires.	4. Measure insulation resistance of Three-phase PVC cable in a distribution board.
	2	Laying of service lines, provision of service fuses, installation of energy meters.	
VI	**1**	2.2 Maintenance of Line: Patrolling and visual inspection of lines, special inspections and night inspections.	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.
	2	Permit to work, arranging of shut downs personally, temporary earthing, cancellation of permit and restoration of supply.	
VII	**1**	Maintenance schedule of busbars, isolating switches, Relays, circuit breakers, LT switches.	6. Study of tests done at the time of commissioning of transmission and distribution line as per IS standards.
	2	**Installation and Maintenance of Underground Cables** 3.1 Installation of Cable: Inspection, storage, transportation and handling of cables.	

VIII	**1**	Clearances from other department such as Municipal, Highway authorities, railway, etc.	7. Prepare list of all electrical accessories required for installation of Pole mounted substation, Plinth mounted substation.
	2	Different methods of laying cable. Introduction to Cable filling compounds, Epoxy resin and hardeners.	
IX	**1**	3.2 Maintenance of Cable: Cable jointing and termination.	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.
	2	Assignment	
X	**1**	Test	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.
	2	**Installation and Maintenance of Electrical Machine** 4.1 Installation of Machine: Inspection and handling of transformers and motors.	
XI	**1**	Installation of power and distribution transformers. Installation of CT and PT. Dehydration of Transformer.	10. Prepare maintenance schedule of Power transformer.
	2	4.2 Maintenance of Machine: Preventive Maintenance schedule of transformer below and above 1000KVA.	
XII	**1**	Maintenance schedule of CT and PT. Preventive Maintenance schedule of motors, over hauling of motors, trouble shooting of electric motors.	11. Prepare maintenance schedule of Distribution Transformer.
	2	**Testing and Commissioning of Electrical Equipment** 5.1 Testing of insulator.	
XIII	**1**	5.2 Testing of transmission and distribution line before commissioning.	12. Prepare maintenance schedule of Motors.
	2	5.3 Testing of electrical motor.	
XIV	**1**	5.4 Testing of transformers.	**File checking and Viva voce**
	2	Test	
XV	**1**	**Assignments**	**File checking and Viva voce**
	2	**Revison**	

Electrical Engineering Department

Lesson plan

Name of Faculty	**Abhishek Kumar**
Discipline	**Electrical Engineering**
Semester	**Fifth Sem (6th sem)**
Subject	**Smart Grid and Distribution Energy System**
Lesson Plan Duration	**From janurary 2025**
Work load [Theory + Practical] Per Week	**[03 +00]**

Week	Day	Theory Topic/ Assignment/ Test
1st	1	**Unit -1: Introduction of Smart Grid-** Conventional Grid system: Introduction, Evolution of electric Grid system, Regulatory authority in Indian Power sector.
	2	Smart Grid system: Introduction, Need of Smart Grid, Benefits of Smart Grid, Challenges of Smart Grid,
	3	Difference between Conventional Grid and Smart Grid system, Smart Grid scenario in Indian power sector.
2nd	1	**Unit 2 : Smart Grid Architecture :-** Components of smart grid system.
	2	Architecture of Smart Grid
	3	Function of Smart Grid components
3rd	1	**Unit 3: - Smart Grid Technology:-** Introduction to Communication and Measurement Technology
	2	Smart infrastructure (smart energy system and smart information system), Smart communication
	3	Smart management.
4th	1	Smart Meter : Advanced meter Infrastructure (AMI) function and its benefits.
	2	**Unit 4- Distributed Generation System :-** Distributed generation (DG): Concept of distributed generation's, selection of sources
	3	Regulatory standards/ framework
5th	1	Standards for interconnecting Distributed resources to electric power systems: IEEE 1547
	2	Overview of Microgrid : concept and definition of microgrid.
	3	SCADA: Introduction to Supervisory Control and Data Acquisition System (SCADA.
6th	1	Functional block diagram, Architecture of SCADA.
	2	**Unit 5 : Smart grids application -** Home Energy Management system
	3	Plug in Hybrid Electric Vehicles (PHEVs)
7th	1	Plug in Hybrid Electric Vehicles (PHEVs) (continuation)
	2	Electrical Energy Storage Technologies
	3	Electrical Energy Storage Technologies (continuation)
8th	1	Function of SCADA in smart grid
	2	Function of SCADA in smart grid (continuation)
	3	Doubt clearing session
9th	1	Revision of Old Question Papers
	2	Revision of Old Question Papers
	3	Revision of Old Question Papers
10th	1	Revision of Old Question Papers

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