

Government Polytechnic Kullu ,Distt. Kullu H.P-175138

Department of Electrical Engineering

Lesson Plan

Name of Faculty	Er Naval Kishor
Discipline	Electrical Engineering
Semester	5 th
Subject	SG&P (L-5 Hrs./Week)
Lesson Plan Duration	August – Nov. 2026

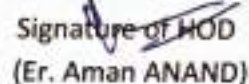
Week	Topic	Theory
1 st (06 Aug. –14 Aug.)	Unit – I Basics of Protection	Necessity, functions of protective system, Normal and abnormal conditions
2 nd (17 Aug. – 22 Aug.)	Unit – I Basics of Protection	Types of faults and their causes. Protection zones and backup protection
3 rd (24 Aug. – 29Aug.)	Unit – II Circuit Interruption Devices	Isolators - Vertical break, Horizontal break and Pantograph type. HRC fuses – Construction, working, characteristics and applications
4 th (31 Aug– 05 Sept.)	Unit – II Circuit Interruption Devices	Arc formation process, methods of arc extinction (High resistance and Low resistance), Arc voltage, Recovery voltage, Re-striking voltage, RRRV.
5 th (07 Sept. –11 Sept.)	Unit – II Circuit Interruption Devices	HT circuit breakers: Sulphur-hexa Fluoride (SF ₆), Vacuum circuit breaker – (Working, construction, specifications and applications). L.T. circuit breaker: Air circuit breakers (ACB).
Class Test – 1		In Second Week of September
6 th (14 Sept. – 19 Sept.)	Unit – II Circuit Interruption Devices	Miniature circuit breakers (MCB), Moulded case circuit breakers (MCCB) and Earth leakage circuit breaker (ELCB)) - Working and applications. Brief introduction to gas insulated switchgear.
7 th (21 Sept. – 26 sept)	Unit– III Protective Relays	Fundamental quality requirements: Selectivity, Speed, Sensitivity, Reliability, Simplicity, Economy. Basic relay terminology - Protective relay, Relay time, Pick up, Reset current, current setting, Plug setting multiplier, Time setting multiplier
8 th (28 Sept. – 03 Oct.)	Unit– III Protective Relays	Protective relays: Classification, principle of working, construction and operation of – Electromagnetic attraction (Attracted armature type, Solenoid type and Watt-hour meter type only) relays.

		Electromagnetic Induction relays: Over current relays: Block diagram, working.
9th (05 Oct. – 09 Oct.)	Unit– III Protective Relays	Distance relaying- Principle, operation of Definite distance relays. Directional relay: Need and operation. Operation of current and voltage differential relay. Brief introduction to Thermal Relay. Brief introduction to Static and Microprocessor based relays and their applications.
Class Test – 2		In Second Week of October
10th (12 Oct. – 17 Oct.)	Unit– IV Protection of Alternator and Transformer Alternator Protection	Alternator Protection: Faults, Differential protection over current, earth fault, overheating and field failure protection. Reverse power protection.
11th (19 Oct. – 24 Oct.)	Unit– IV Protection of Alternator and Transformer Alternator	Transformer Protection Different Faults (brief introduction), Differential, over current, earth fault, over heating protection.
12th (27 Oct. – 31 Oct.)	Unit– IV Protection of Alternator and Transformer Alternator	Limitations of differential protection. Buchholz relay: Construction, operation, merits and demerits.
House Test		In First Week of November
13th (09 Nov- 13 Nov)	Unit– V Protection of Motors, Bus-bar and Transmission Line Motor	Motors Faults, Short circuit protection, Overload protection, Single phase preventer
14th (16 Nov- 21 Nov)	Unit– V Protection of Motors, Bus-bar and Transmission Line Motor	Bus bar and Transmission line Faults on Bus bar and Transmission Lines. Bus bar protection: Differential and Fault bus protection. Transmission line: Over current, Distance and Pilot wire protection.
15th (23 Nov- 28 Nov)		Revision and Doubt clearance

NOTE: Lesson Plan is Tentative, subject to availability of Time, Students & Faculty.



Signature of Teacher/Prepared by
(Er. Naval Kishor)



Signature of HOD
(Er. Aman ANAND)

Government Polytechnic Kullu, Distt. Kullu (H.P)175138

Department of Electrical Engineering

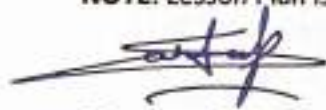
Lesson Plan

Name of Faculty	Er Sandeep Bhardwaj
Discipline	Electrical Engineering
Semester	5th
Subject	EC&A (L-5 Hrs./Week)
Lesson Plan Duration	August – December 2026

Week	Topic	Theory
1 st (06 Aug. – 14 Aug.)	Unit – I Energy Conservation Basics	Energy Scenario: Primary and Secondary Energy, Energy demand and supply, National scenario. Energy conservation
2 nd (17 Aug. – 22 Aug.)	Unit – I Energy Conservation Basics	Energy audit; concepts and difference Star Labelling: Need and its benefits
3 rd (24 Aug. – 29 Aug.)	Unit – II Energy Conservation in Electrical Machines	Need for energy conservation in induction motor. Energy conservation techniques in induction motor by: Motor survey Matching motor to load
4 th (31 Aug – 05 Sept.)	Unit – II Energy Conservation in Electrical Machines	Operating in star mode. Rewinding of motor. Replacement by energy efficient motor, Periodic maintenance
5 th (07 Sept. – 11 Sept.)	Unit – II Energy Conservation in Electrical Machines	Energy efficient motor; significant features, advantages, applications and limitations. Need for energy conservation in transformer: Energy efficient transformers, amorphous transformers; epoxy Resin cast transformer / Dry type of transformer
Class Test – 1		In Second Week of September 2026.
6 th (14 Sept. – 19 Sept.)	Unit– III Energy conservation in Electrical Installation systems	Aggregated Technical and commercial losses (ATC); Power system at state, regional, national and global level. Technical losses; causes and measures to reduce these (no expression only theory part) a) Controlling I ² R losses
7 th (21 Sept. – 26 Sept.)	Unit– III Energy conservation in Electrical Installation systems	b) Optimizing distribution voltage c) Balancing phase currents Energy conservation in lighting sources:
8 th (28 Sept. – 03 Oct.)	Unit– III Energy conservation in Electrical Installation systems	a) Replacing Lamp sources. b) Using energy efficient luminaries
9 th (05 Oct. – 09 Oct.)	Unit– IV Energy conservation through	Co-generation and Tariff; concept, significance for energy conservation Co-generation Types of cogenerations on basis of sequence of energy use (basic introduction to

	Cogeneration and Tariff	Topping cycle & Bottoming cycle)
Class Test – 2		In Second Week of October 2026.
10th (12 Oct. – 17 Oct.)	Unit– IV Energy conservation through Cogeneration and Tariff	Types of cogeneration basis of technology (Steam turbine cogeneration, Gas turbine cogeneration). Factors governing the selection of cogeneration system, advantages of cogeneration.
11th (19 Oct. – 24 Oct.)	Unit– IV Energy conservation through Cogeneration and Tariff	Tariff: Types of tariff structure; Special tariffs; Time-off-day tariff, Peak-off-day tariff, Power factor tariff, Maximum Demand tariff, Load factor tariff. Application of tariff system to reduce energy bill.
12th (27 Oct. – 31 Oct.)	Unit– V Energy Audit of Electrical System	Energy audit (definition as per Energy Conservation Act) Energy audit instruments and their use
House Test		In First Week of November 2026.
13th (16 Nov- 21 Nov)	Unit– V Energy Audit of Electrical System	Questionnaire for energy audit projects. Energy flow diagram (Sankey diagram)
14th (23 Nov- 28 Nov)	Unit– V Energy Audit of Electrical System	Questionnaire for energy audit projects. Energy flow diagram (Sankey diagram)

NOTE: Lesson Plan is Tentative, subject to availability of Time, Students & Faculty.


Signature of Teacher
(Er. Sandeep Bhardwaj)


Signature of HOD
(Er. Aman Anand)

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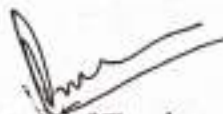
Department of Electrical Engineering

Lesson Plan

Name of Faculty	Er Aman Anand
Discipline	Electrical Engineering
Semester	5th
Subject	Solar Power Technologies (L-5 Hrs./Week)
Lesson Plan Duration	August – November 2025

Week	Topic	Theory
1 st (06 Aug. – 14 Aug.)	Unit – I Unit – I Solar Energy	Solar Map of India: Global solar power radiation Different types of Solar water heaters: Construction, working.
2 nd (17 Aug. – 22 Aug.)	Unit – I Unit – I Solar Energy	Different types of solar cookers, Solar Drying process, solar lighting, and Preventive maintenance of all of the above.
3 rd (24 Aug. – 29 Aug.)	Unit – II Concentrated Solar Power (CSP)	Concentrated Solar Power (CSP) plants or solar thermal electric systems
4 th (31 Aug – 05 Sept.)	Unit – II Concentrated Solar Power (CSP)	Parabolic Trough: Construction, working and specifications Parabolic Dish: Construction, working and specifications
5 th (07 Sept. – 11 Sept.)	Unit – II Concentrated Solar Power (CSP)	Fresnel Reflectors: Construction, working and specifications Preventive maintenance of all of the above
Class Test – 1		In Second Week of September
6 th (14 Sept. – 19 Sept.)	Unit– III Solar PV Systems	Solar PV cell: Types, construction, working of solar cells. Solar PV working principle: Series and parallel connections of solar modules
7 th (21 Sept. – 26 sept)	Unit– III Solar PV Systems	Solar Photovoltaic (PV) system: components, layout and working. Solar modules and solar arrays.
8 th (28 Sept. – 03 Oct.)	Unit– III Solar PV Systems Unit– IV Solar PV Electronics	Solar PV systems and typical specifications. Maintenance of all of the above. Solar Charge controllers: working and specifications, switchgear and cables Batteries: Different types for solar PV systems
9 th (05 Oct. – 09 Oct.)	Unit– IV Solar PV Electronics	Solar Inverters: working and specifications Solar Power tracking: construction, working
Class Test – 2		In Second Week of October

10th (12 Oct. – 17 Oct.)	Unit– IV Solar PV Electronics	tilt angle, maximum power point tracking (MPPT) Maintenance of these systems.
11th (19 Oct. – 24 Oct.)	Unit– V Solar PV Off-grid and Grid Tied Systems	Solar off grid systems: layout and specifications
12th (27 Oct. – 31 Oct.)	Unit– V Solar PV Off-grid and Grid Tied Systems	Solar Grid tied (on grid) systems: Working principle of grid-tied dc-ac inverter.
House Test		In First Week of November
13th (09 Nov- 13 Nov)	Unit– V Solar PV Off-grid and Grid Tied Systems	Grid synchronization and active power export..
13th (16 Nov- 21 Nov)	Unit– V Solar PV Off-grid and Grid Tied Systems	Brief introduction to Solar-Wind Hybrid systems.
14th (23 Nov- 28 Nov)	Revision	


Signature of Teacher


Signature of Principal

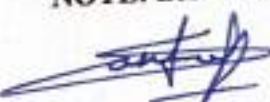
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Department of Electrical Engineering
Lesson Plan

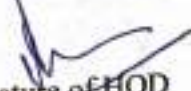
Name of Faculty	Er Sandeep Bhardwaj
Discipline	Electrical Engineering
Semester	5th
Subject	Wind Power Technologies (L-5 Hrs./Week)
Lesson Plan Duration	August – November 2026

Week	Topic	Theory
1 st (06 Aug. – 14 Aug.)	Unit – I Wind Energy and Wind Power Plants	Wind power scenario in the world and India. Wind Turbine Terminologies: (definitions only) Rotor blades, hub, nacelle, tower, electric sub-station, Cut in, cut-out and survival wind speeds, Threshold wind speeds, rated power, nominal power, Wind Power Curve.
2 nd (17 Aug. – 22 Aug.)	Unit – I Wind Energy and Wind Power Plants	Characteristics of Wind Energy: Wind movement, wind profile, roughness, effects of obstacles in wind path. Rotation principles: Drag and Lift principle, thrust and torque of wind turbine rotor.
3 rd (24 Aug. – 29 Aug.)	Unit – II Construction and Working of Large Wind Power Plants.	Major parts and Functions of WPP (brief introduction): layouts of Geared, Direct-Drive Wind Power Plants.
4 th (31 Aug – 05 Sept.)	Unit – II Construction and Working of Large Wind Power Plants.	Different types of Sensors (brief introduction): Anemometer, wind vane, rpm sensors of main shaft and generator, temperature sensors of nacelle, gearbox and generator; cable untwisting and vibration sensors.
5 th (07 Sept. – 11 Sept.)	Unit – II Construction and Working of Large Wind Power Plants.	Different types of Actuators (brief introduction): Electric and hydraulic pitching and yawing mechanisms, cable untwisting and braking mechanisms
Class Test – 1		In Second Week of September 2026.
6 th (14 Sept. – 19 Sept.)	Unit– III Maintenance of Large Wind Power Plants	General maintenance of WPPs: preventive maintenance schedule of actuators such as yaw control, pitch control
7 th (21 Sept. – 26 Sept.)	Unit– III Maintenance of Large Wind Power Plants	Braking mechanisms and sensors; oiling and greasing; electric and electronic equipment related; tower related; minor repairs, some tips.
8 th (28 Sept. – 03 Oct.)	Unit– IV Construction and Working Small Wind Turbines	Types and working of different type of small wind turbines (SWT): Classification: Horizontal and Vertical axis.
9 th (05 Oct. – 09 Oct.)	Unit– IV Construction and Working Small Wind Turbines	Upwind and Downwind, One, Two and Three blade.

Class Test - 2		In Second Week of October 2026.
10 th (12 Oct. - 17 Oct.)	Unit- IV Construction and Working Small Wind Turbines	Parts of SWTs: Rotor, generator, gearbox, tower, electric control panel, tale vane, anemometer, wind vane, temperature and rpm sensors.
11 th (19 Oct. - 24 Oct.)	Unit- V Maintenance of Small Wind Turbines	Small wind turbine assembly.
12 th (27 Oct. - 31 Oct.)	Unit- V Maintenance of Small Wind Turbines	Installation of different types of small wind turbines (SWT): tubular and lattice types.
House Test		In First Week of November 2026.
13 th (16 Nov- 21 Nov)	Unit- V Maintenance of Small Wind Turbines	SWT Routine maintenance: Tips; Preventive maintenance schedule of: braking mechanisms
14 th (23 Nov- 28 Nov)	Unit- V Maintenance of Small Wind Turbines	Sensors; oiling and greasing related; electric and electronic equipment related; tower related; software related, minor repairs

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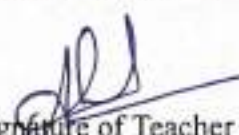
Lesson Plan

Name of Faculty	Er Akash
Discipline	Electrical Engineering
Semester	5th
Subject	PLC & Automation (L-4 Hrs./Week)
Lesson Plan Duration	August – November 2025

Week	Topic	Theory
1 st (06 Aug. – 14 Aug.)	Unit I : Introduction	Introduction to Automation 1.1 Definition, 1.2 Role of Automation, 1.3 Industrial Applications, 1.4 History of Automation
2 nd (17 Aug. – 22 Aug.)	Unit II: Automation Components	Relays: Concept of relays, Relay wiring for logic gates Switches and its types
3 rd (24 Aug. – 29 Aug.)	Unit II: Automation Components	Working principal of Optical Sensors, Capacitive Sensors, Inductive Sensors, Ultrasonic Sensors,
4 th (31 Aug– 05 Sept.)	Unit II: Automation Components	Fluid flow Industrial Sensors, Angular displacement (Potentiometers, Encoders, tachometers),
5 th (07 Sept. – 11 Sept.)	Unit II: Automation Components	Linear Position (LVDT), Forces and Moments (Strain gages, Piezoelectric), Liquids and Gases (Pressure, Venturi valves, Magnetic and Ultrasonic flow meter, Pilot Tubes),
Class Test – 1		In Second Week of September
6 th (14 Sept. – 19 Sept.)	Unit II: Automation Components	Temperature (RTDs, Thermocouples, Thermistors), Light (LDR). 2.4 Concept of Control Actuators, Different types) Control Actuators (Solenoids, Valves, Hydraulics, Pneumatics
7 th (21 Sept. – 26 sept)	Unit III: PLC (Programmable Logic controller)	Introduction, Advantages of PLC control Panel, Architecture of PLC, - Functions of various Blocks of PLC, Working principle of PLC, Memory types , Different types of Input/Output circuits
8 th (28 Sept. – 03 Oct.)	Unit III: PLC (Programmable Logic controller)	Concept of inputs and outputs: Concept of Digital inputs and outputs, Concept of Analog inputs and outputs

9th (05 Oct. – 09 Oct.)	Unit III: PLC (Programmable Logic controller)	Concept of sink and source input/ output cards, Programming Methods, Programming devices, Programming with PLC Basic Instructions - NO and NC contacts
Class Test – 2		In Second Week of October
10th (12 Oct. – 17 Oct.)	Unit III: PLC (Programmable Logic controller)	Boolean gates - symbols and truth tables, Introduction to Ladder Logic programming, Concept of latching and unlatching
11th (19 Oct. – 24 Oct.)	Unit III: PLC (Programmable Logic controller)	Timers and counters, Maintenance and Trouble Shooting of PLC, Selection of PLC, Applications
12th (27 Oct. – 31 Oct.)	Unit IV: Programing Instructions	User and Bit Functions, Timer and Counters,
House Test		In First Week of November
13th (09 Nov- 13 Nov)	Unit IV: Programing Instructions	Input / Output, Compare Compute/math Instructions,
14th (16 Nov- 21 Nov)	Unit IV: Programing Instructions	Move and Logical Instructions.
15th (23 Nov- 28 Nov)	Revision	

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Department of Electrical Engineering

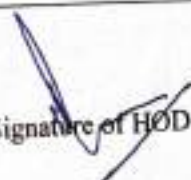
Lesson Plan

Name of Faculty	Er. Naval Kishor
Discipline	Electrical Engineering
Semester	5th
Subject	SG&P (P-2 Hrs./Week)
Lesson Plan Duration	Aug- November 2026

Week	Practical No.	Practical Name
1 st (06 Aug. –14 Aug.)	Practical-1	Identify various switchgears in the laboratory and write their specifications
2 nd (17 Aug. – 22 Aug.)		
3 rd (24 Aug. – 29 Aug.)	Practical-2	Test HRC fuse by performing the load test.
4 th (31 Aug – 05 Sept.)		
5 th (07 Sept. –11 Sept.)	Practical-3	Test MCB by performing the load test.
6 th (14 Sept. – 19 Sept.)		
7 th (21 Sept. – 26 sept)	Practical-4	Dismantle MCCB/ELCB and identify various parts.
8 th (28 Sept. – 03 Oct.)		
9 th (05 Oct. – 09 Oct.)	Practical-5	Dismantle ACB/VCB and identify different parts.
10 th (12 Oct. – 17 Oct.)		
11 th (19 Oct. – 24 Oct.)	Practical-6	Set the plug and time (with PSM, TSM) of induction type electromagnetic relay.
12 th (27 Oct. – 31 Oct.)		
13 th (09 Nov- 13 Nov)	Practical-7	Test electromagnetic over-current relay by performing load test.
14 th (16 Nov- 21 Nov)		
15 th (23 Nov- 28 Nov)		Revision

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Government Polytechnic Kullu, Distt. Kullu H.P.

Department of Electrical Engineering

Lesson Plan

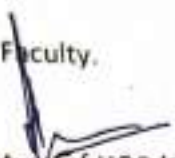
Name of Faculty	Er. Devender Kumar
Discipline	Electrical Engineering
Semester	5th
Subject	Energy Conservation and Audit Lab
Lesson Plan Duration	August – Nov 2026

Week	Practical No.	Practical Name
1 st (1 Aug. - 7 Aug.)	Practical-I	Identify Star labeled Electrical apparatus
2 nd (10 Aug. - 15 Aug.)	Practical-2	compare the data for various star ratings & prepare report
3 rd (17 Aug. - 22 Aug.)	Practical-3	Determine the reduction in power consumption by replacement of lamps in a class rooms / laboratory
4 th (24 Aug. - 29 Aug.)	Practical-4	Prepare report for the above
5 th (31 Sept. - 5 Sept.)	Practical-5	Determine the reduction in power consumption by replacement of Fans Regulators in a class rooms / laboratory
6 th (7 Sept. - 11 Sept.)	Practical-6	Prepare Report for the above
7 th (14 Sept. - 19 Sept.)	Practical-VII	Collect electricity Bill of a residential consumer and suggest Suitable means for conservation and reduction of energy bill
8 th (21 Sept. - 26 Sept.)	Practical-VIII	Prepare a an Energy Audit report for(phase I)
9 th (28. - 3 Oct.)	Practical-IX	Prepare a an Energy Audit report for(phase I)
10 th (5 Oct. - 10 Oct.)	Practical-X	Prepare a an Energy Audit report for(phase II)
11 th (12 Oct. - 17 Oct.)	Practical-XI	Prepare a an Energy Audit report for(phase II)
12 th (19 Oct. - 24 Oct.)	Practical-XII	Prepare a an Energy Audit report for(phase III)
13 th (27 Oct. - 31 Oct.)	Practical-XIII	Prepare a an Energy Audit report for(phase III)

14 th (16 Nov. -14 Nov.)		Prepare a an Energy Audit report for(phase II)
15 th (23Nov- 28 Dec)		Revision

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 Prepared by
 (Er. DevenderKumar)


 Signature of HOD/OIC
 (Er. Aman Anand)

Government Polytechnic Kullu, Distt. Kullu (H.P)175138
Department of Electrical Engineering
Lesson Plan

Name of Faculty	Er. Lalit Kumar
Discipline	Electrical Engineering
Semester	5 th
Subject	Solar Power Technologies (P-2 Hrs./Week)
Lesson Plan Duration	August – December 2026

Week	Practical No.	Practical Name
1 st (06 Aug. –14 Aug.)	Practical-1	Assemble the parabolic dish CSP plant.
2 nd (17 Aug. – 22 Aug.)		
3 rd (24 Aug. – 29Aug.)	Practical-2	Dismantle the parabolic dish CSP plant.
4 th (31 Aug– 05 Sept.)		
5 th (07 Sept. –11 Sept.)	Practical-3	Troubleshoot a CSP plant
6 th (14 Sept. – 19 Sept.)		
7 th (21 Sept. – 26 sept)	Practical-4	Assemble the solar PV system.
8 th (28 Sept. – 03 Oct.)		
9 th (05 Oct. – 09 Oct.)	Practical-5	Dismantle the solar PV system
10 th (12 Oct. – 17 Oct.)	Practical-6	Troubleshoot a solar PV system
11 th (19 Oct. – 24 Oct.)		
12 th (27 Oct. – 31 Oct.)	Practical-7	Troubleshoot a solar PV panels and arrays
13 th (25 Nov- 28 Nov)		
13 th (16 Nov- 21 Nov)		
14 th (23 Nov- 28 Nov)	Revision and evaluation	

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Prepared by
(Er. Lalit Kumar)

Signature of HOD/OIC
(Er. Aman Anand)

Lesson Plan (Aug-Nov 2026)

Name of Teacher: **Geeta Nand** Subject : **Student Centered Activities** Class : **5th Semester Elect. Engg.**

S. No.	Month	Date	Activity to be covered
1	August	6st Aug to 30th Aug	Declamation Contest
			Cleanliness Drive around college campus
			Various Gym activities
2	September	1st Sept to 30 Sept	Sports activities - Table tennis competition
			Music contests
			Yoga
3	Oct	1st Oct to 31st Oct	Group discussion on various topics
			Parliamentary discussions
			Exposure to new Technologies.
4	Nov	2nd Nov to 28th Nov	Poster Making / Slogan Writing Competition Debate Competition Entrepreneurship & Innovation Workshop / Startup Idea Pitch


Faculty Incharge


H.O.D. - Electrical Engg.