

PLANNED SYLLABUS COVERAGE(Theory)

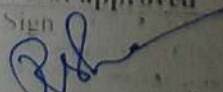
G P		Department: <u>Electrical Engg.</u>		Subject <u>Switchgear & Protection</u>		
Kangra		Course <u>Diploma (PC)</u>		Duration <u>03 year (06-month)</u>		
SYLLABUS COVERAGE		Total Periods <u>70</u>		Theory <u>70 (14x5 = 70)</u>		
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1.	1-8	Basics of Protection	- Necessity, functions of protective system, Normal & abnormal conditions - Types of faults & their causes. - Protection zones & backup protection			
2.	9-26	Circuit Interruption Devices	- Isolators- vertical break, Horizontal break & pantograph type, HRC fuses- Construction, working, characteristics & applications, Arc formation process, methods of arc extinction (High & low resistance), Arc voltage, Recovery voltage, Restriking voltage, RRRV. - HT circuit breakers: SF₆, vacuum circuit breaker. L.T. circuit breakers - Air circuit breaker (ACB), MCB, moulded case circuit breakers (MCCB) & Earth leakage circuit breaker (ELCB) - Working & applications, introduction to gas insulated switchgears.			
3.	27-44	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. - Protective relay: classification, principle of working, construction & operation of Electromagnetic attraction relay. - Electromagnetic induction relays: Over current relays: Block diagram, working - Distance relaying. principle, operation of Definite distance relays. Directional relay, Need & operation. Operation of current &			

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4.	45-60	Protection of Alternator and Transformer protection	voltage differential relay. Brief introduction of Thermal relay, static & microprocessor based relays & their applications. Faults, Differential protection over current, earth fault, overheating & field failure protection, Reverse power protection. Transformer protection: Different faults, Differential, over current, earth fault, earth fault, overheating protection, Limitation of differential protection, Buchholz relay, construction of transformer & demerits.			
5.	61-70	Protection of motors, bus bar & Transmission line, Motor	Faults, short circuit protection. Overload protection, 2-ϕ protection. Bus bar & transmission line: faults on bus bar & transmission lines. Bus bar protection: Differential & fault bus protection, Transmission line: Over current, Distance & pilot wire protection.			

Extra Topics to be covered beyond the scope of the syllabus (as required by industry/ as recommended by Teacher which he/ she finds necessary)

Sr. No.	Period No.	Topic Covered	Instruction Reference	Additional Study recommended	Remarks

Date 03/08/2026	Approved / Not approved HOD Sign 
Date 13/08/2026	Principal Sign 

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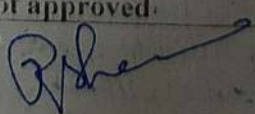
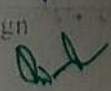
G P Kangra		Department: <u>Electrical Engg.</u>		Subject <u>Solar Power Technologies</u>		
		Course <u>Diploma (PC)</u>		Duration <u>03 year (06-month)</u>		
SYLLABUS COVERAGE		Total Periods <u>70</u>		Theory <u>70 (14x5 = 70)</u>		
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1.		Solar Energy	Solar map of India: Global solar power radiation, Different types of solar water heaters: construction & working. Different types of solar cookers, solar drying process, solar lighting & preventive maintenance of all of the above.			
2.		Concentrated Solar power plant (CSP)	Concentrated solar power plant, or solar thermal electric systems, parabolic trough: construction, working & specifications, Parabolic dish: construction, working & specifications, Fresnel reflectors: construction, working & specifications, preventive maintenance			
3.		Solar PV Systems	Solar PV cell: Types, construction working of solar cells, solar PV working principle: series & parallel connections of solar modules, solar PV system: components, layout & working. Solar modules & arrays. Solar PV systems & typical specifications maintenance of all of the above.			
4.		Solar PV off-grid & Grid-tied Systems	Solar charge controllers: working & specifications, switchgear & cables, batteries: Different types for solar PV systems, Solar inverter working &			

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Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
5.		Solar PV off-grid & Grid tied Systems	Layout & specifications. Solar power tracking: construction working, tilt angle, maximum power point tracking (MPPT), maintenance of these system • Solar off grid systems: layout & specifications, Solar Grid tied (on-grid) systems: Working principle of grid-tied dc-ac inverter, grid synchronization & active power export. Brief introduction to solar-power wind hybrid systems.			

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PLANNED SYLLABUS COVERAGE(Theory)

GPK-F-17

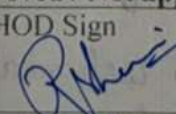
G P Kangra		Department: <u>EE</u>	Subject <u>EC & A</u>			
SYLLABUS COVERAGE		Course <u>Diploma</u>	Duration <u>3 years</u>			
		Total Periods <u>70</u>	Theory <u>70</u>			
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1.	1-9	Unit -1 Energy Conservation Basics	Energy Scenario: Primary and secondary Energy, Energy demand and supply National scenario: Energy conservation and Energy audit; concepts and different Star labelling: Need and Its Benefits.			
2.	10-25	Unit-2 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, operating in star mode, Rewinding of motor, Replacement by energy efficient motor, Periodic maintenance energy efficient motor, significant features, advantages, application and limitations. Need for energy conservation in transformer Energy efficient transformer epoxy Resin cast transformer Dry type of transformer			
3.		Unit-3 Energy conservation	Aggregated Technical and commercial losses:			

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Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
A.	26-40	im Electrical installation systems.	regional, national and global. Technical losses, causes and measures to reduce these (a) controlling IR losses (B) Balancing phase current			
	40-55	Unit-4 Energy conservation through cogeneration and Tariff	co-generation and Tariff; concepts, significance for conservation co-generation Types of cogeneration. Types of cogeneration basis of technology. Factors governing the selection of cogeneration system, advantages of cogeneration.			
5.	56-70	Unit-5 Energy Audit of Electrical system	Energy audit, Energy audit instruments and their use, Energy flow diagram.			

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Date 03-08-2026	HOD Sign 
Date 03-8-26	Principal Sign 

PLANNED SYLLABUS COVERAGE(Theory)

G P Kangra		Department: <u>EE</u> Subject <u>WPT</u>				
SYLLABUS COVERAGE		Course <u>Program Elective</u> Duration <u>03 years</u>				
		Total Periods <u>70</u> Theory <u>70</u>				
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1.	16 (1-16)	Wind Energy & Wind Power Plants	Wind Power scenario world / India; Wind Power technologies, Rotor blades, hub, nacelle, tower, cut-in, cut-out & survival wind speeds, characteristics of wind energy, Rotation Principles: Drag & lift principle, thrust & torque of turbine rotors.	Wind Power Technologies, P.H.I, Lamsing, Rachal, Stuti, Econest, Joshua.	Energy Technologies, Bhanna. Publishing House; O.P. Gupta	
2.	18 (17-34)	Construction & working of large wind Power Plants	Major Parts & functions of WPP: geared & direct drive. Different types of sensors (brief introduction). Different types of actuators (brief introduction).			
3.	11 (35-45)	Maintenance of large wind power plants	General maintenance of WPP's: preventive maintenance schedule, of actuators, sensors/oil/greasing, electric/electronic equipment, tower related minor repairs.	//	//	

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Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
4.	14 (46-60)	Maintenance Construction & working of small wind turbines	Types & working of different small wind turbines : classification: Horizontal axis & vertical axis. Various parts of SWT's	//	//	
5.	10 (61-70)	Construction & working of small wind turbines	Types & working of diff. types of small wind turbines, small wind turbine assembly, installation: tubular / lattice types ; SWT routine main- -tenance.	//	//	

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Sr. No.	Period No.	Topic Covered	Instruction Reference	Additional Study recommended	Remarks

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Use additional sheets (if required).

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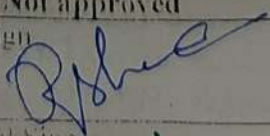
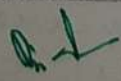
G P Kangra		Department: <u>Electrical Engg</u> Subject: <u>Open Elective-I</u>		Course: <u>Diploma</u> Duration: <u>3 Years</u>		SYLLABUS COVERAGE	Total Periods	Theory	56	Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1	10 (1-10)	Introduction	World Energy Use:- Reserves of Energy Resources; Environmental Aspects of Energy Utilization. Renewable Energy Scenario in India and around the World: Potentials; Achievements/ Applications: Economics of renewable energy systems.	O.P Gupta Energy Technology Khanna Publishing House Delhi (ed 2008)	Renewable Energy sources. Twidell J. W & Weir A. EFN Spun Ltd U.K 2006											
2	11 (11-21)	Solar Energy	Solar Radiation; Measurements of solar Radiation, Flat Plate & Concentrating Collectors; Solar direct Thermal Applications; Solar Thermal Power Generation, Fundamentals of Solar Photo voltaic Conversion solar Cells; Solar PV Power Generation; solar PV applications.	-do- -do-	-do- -do-											

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Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
3.	12 (22-33)	Wind Energy	Wind Data & Energy Estimation; Types of Wind Energy Systems; Performance; Site Selection; Details of wind Turbine Generators Safety and Environmental Aspects. Biomass direct Combustion; Bio-mass gasifiers;			
4.	12 (34-45)	Bio Energy				

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Date	Principal Sign 

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PLANNED SYLLABUS COVERAGE(Theory)

GPK-F-17

G P Kangra		Department: <u>EE</u>		Subject <u>Open Elective-1</u>		Remarks
SYLLABUS COVERAGE		Course <u>Diploma</u>		Duration <u>3 Years</u>		
		Total Periods		Theory <u>56</u>		
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	
5.	11 (46-56)	Other Renewable Energy Sources.	Biogas plants ; Digesters , Ethanol production ; bio-diesel , Cogeneration ; Biomass Applications. Tidal energy ; Wave Energy, open & closed OTEC cycles, Small Hydro- Geothermal Energy, Hydrogen & storage, Fuel Cell systems ; Hybrid systems .	Renewable Energy & Environment A Policy Analysis for India NH Ravindra-nath, UK Rao, B Natarajan, P Monga Tata McGraw Hill.		

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