

PLANNED SYLLABUS COVERAGE(Theory)

G P		Department: <u>EE</u>		Subject: <u>SG & P</u>		
Kangra		Course: <u>Diploma</u>		Duration: <u>3 years</u>		
SYLLABUS COVERAGE		Total Periods: <u>70</u>		Theory: <u>70</u>		
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1.	1-10	Chapter-1 Basics of Protection	Necessity, functions of protective system, Normal and abnormal conditions. Types of faults and their causes. Protection zones and backup protection.			
2.	11-25	Chapter-2 Circuit Interruption devices	Isolators-Vertical break, Horizontal break and Pantograph type. HRC fuses-Construction, working characteristics and applications. Arc formation process, methods of arc extinction, Arc v/f, Recovery v/f, Re-striking v/f, RARV. HT CB, SF ₆ , Vacuum CB. LT CB: ACB, MCB, Molded case CB & brief introduction to GSG.			
3.	26-40	Chapter-3 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, Electromagnetic Induction relays, Distance relaying, Directional relay, Thermal relay, Classification, Working and operation, static and Microprocessor Relays and their applications.			

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Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
4.	41-55	Chapter-4. Protection of Alternators and Transformers Alternator Protection	Faults, differential protection, over current, earth fault, overheating and field failure protection. Reverse power protection. Transformer Protection $\Rightarrow$ Different Faults, differential, over current, earth fault. Buchholz relay: Construction, operation, merits and demerits.			
5.	56-70	Chapter-5 Protection of Motors, Bus Bars and Transmission Line Motors	Faults, short circuit protection, overload protection, single phase protector.			

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

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PLANNED SYLLABUS COVERAGE(Theory)

G P Kangra		Department: <u>EE</u>	Subject: <u>EC & A</u>			
		Course: <u>Diploma</u>	Duration: <u>3 years</u>			
SYLLABUS COVERAGE		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 difference. Star labelling: Need and its benefits.	Energy Conservation & Audit By	Internet	
2.	10-25	Unit-2 Energy conservation in Electrical Machines	Need for energy conservation in introduction 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, applications and limitations. Need for energy conservation in transformer: Energy efficient transformer epoxy Resin cast transformer Dry type of transformer.	M. R Chaudhary S M Chaudhary S. A. Asabku Nirali Prakashan.		
3.		Unit-3 Energy conservation	Aggregated Technical and commercial losses: regional, national and			

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1.	26-40	In Electrical Installation systems.	global. Technical losses & causes and measures to reduce these (a) controlling I^2R losses (b) Balancing phase current			
4.	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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PLANNED SYLLABUS COVERAGE(Theory)

G P Kangra		Department: <u>Electrical Engg.</u> Subject <u>Solar Power Technologies</u>				
		Course <u>Diploma</u>	Duration <u>03 year</u>			
SYLLABUS COVERAGE		Total Periods <u>70</u> Theory <u>70</u>				
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1.	1-10	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.	Renewable Energy Sources by D.P. Kothari.	Basic concepts of Semiconductor physics: diode, photodiode. & Light waves & radiation,	
2.	11-24	Concentrated Solar Power	Concentrated solar power plant or solar thermal electric Systems, Parabolic Trough, Construction, working & specification, Fresnel reflectors, construction working & specifications, preventive maintenance of all of the above.	Energy technology by A.P. Gupta, Solar PV fundamental technologies by Solanki.	Heat transfer methods	
3.	25-38	Solar PV systems	Solar PV cell, types, construction, working, Solar PV working principle series & parallel connections of solar modules, Solar PV system, components, layout & working, Solar modules & solar arrays, Solar PV systems & typical specifications, maintenance of all of the above.	Renewable Energy by Godfrey Boyle.		

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4.	39-56	Solar PV Electronics	Solar Charge controllers, working & specifications, switchgear & cables batteries, different types of solar PV systems, Solar Inverters, working & specifications, Solar power tracking, construction, working, tilt angle, MPPT, maintenance of these systems			
5.	57-70	Solar PV off-grid & Grid tied system	Solar off grid systems, layout & specifications, Solar grid tied (on grid) systems, Working principles of grid-tied dc-ac inverter, grid synchronization & active power export, Brief introduction of Solar-wind Hybrid systems.			

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PLANNED SYLLABUS COVERAGE(Theory)

G P Kangra		Department: <u>EE</u> Subject <u>WPT</u>			
SYLLABUS COVERAGE		Course <u>Diploma (5th Sem.)</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
1.	16 (1-16)	Wind Energy & Wind Power Plants	Wind Power Elements: World/India; Wind Power terminology: 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 rotor.	Wind Power Technologies P.T. Raising, Rachal, Stuti, Ecomet, Joshua.	Energy Technologies, Khanna 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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4.	(14) (46-60)	Maintenance construction & working of small wind turbines	Types & working of diff. small wind turbines: Classification: Horizontal/ Vertical axis. Various parts of SWT	//	//	
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 maintenance.	//	//	

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PLANNED SYLLABUS COVERAGE(Theory)

G P		Department: EE		Subject Renewable Energy		
Kangra		Course Diploma		Duration 3 years		
SYLLABUS COVERAGE		Total Periods 56		Theory 56		
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1.	Unit-1: 1-10	Unit : 1 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.	Renewable Energy By J.W. Weir	Internet.	
2.	11-21	Unit : 2 Solar energy	Solar radiations; Measurements of solar radiations; Flat plate and concentrating Collectors; Solar direct thermal applications; solar thermal power generations; Fundamentals of solar photovoltaic conversion; Solar cell; Solar PV applications.	Solar Energy By Sukhane Tata Mc Graw Hill.		
3.	22-33	Unit : 3 Wind energy	Wind data and energy Estimations; Types of wind energy system; Performance site selection; Details of wind turbine Generator, safety and Environmental Aspects			

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4.	34-45	Unit: 4 Bio energy	Biomass direct combustion; Biomass gasifier, Biogas plants, Digesters; Ethanol production; Biodiesel, Cogeneration Biomass applications.			
5.	46-56	Unit: 5 Other Renewable energy sources.	Tidal energy; Wave energy; open and closed OTEC cycles, Small hydro-biothermal energy, Hydrogen and storage; Fuel cell systems; Hybrid system.			

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