GOVT. POLYTECHNIC SUNDERNAGAR

LESSON PLAN SUBJECT- S&P SEM: 5TH

S.NO	CHAPTER	TOPICS	REMARKS
week1	**Basics of Protection**	Necessity of protective system,	
		functions of protective system	
		Normal conditions.	
		abnormal conditions.	
		Types of faults	
		causes of faults	
		Protection zones	
		backup protection	
week2		Revision of chapter 1	
		Test of chapter 1	
week3	**Circuit Interruption Devices**	Isolators - Vertical break, Horizontal break	
		Isolators - Pantograph type.	
		HRC fuses – Construction and working,	
week4		characteristics and applications of HRC fuses	
		Arc formation process, methods of arc extinction (High resistance and Low resistance	
		Arc voltage, Recovery voltage,Restriking voltage,RRRV	
week5		HT circuit breakers: Sulphur-hexa Fluoride (SF6),	
		Vacuum circuit breaker – (Working, construction, specifications and applications	
week6		L.T. circuit breaker: Air circuit breakers (ACB),	
		Miniature circuit breakers (MCB), Moulded case circuit Breakers (MCCB)	
week7		breakers (MCCB) and Earth leakage circuit breaker (ELCB)) - Working and applications.	
		Brief introduction to gas insulated switchgear	
		Revision of chapter 2	
		Test of chapter 2	
week7	**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	
week8		multiplier, Time setting multiplier.	
		Electromagnetic attraction (Attracted armature type, Solenoid type and Watt-hour meter type only) relays.	
		Electromagnetic Induction relays: Over current relays: Block diagram, working.	
week9		Distance relaying- Principle, operation of Definite distance relays.	
		Directional relay: Need and operation.	
		Operation of current and voltage differential relay.	
week10		Brief introduction to Thermal Relay.	
		Brief introduction to Static and Microprocessor based relays and their applications.	
		Revision of chapter 3	
		Test of chapter 3	

	Protection of Alternator and Transforme r Alternator Protection	Faults, Differential protection	
		over current protection	
		earth fault, overheating and field failure protection.	
		overheating protection.	
		field failure protection.	
week11		Reverse power protection.	
		Different Faults (brief introduction)	
		Differential of tranformer	
		over current protection of transformer	
		earth fault protection of transformer	
		over heating protection	
		Limitations of differential protection	
week12		Buchholz relay: Construction, operation, merits and demerits.	
		Revision of chapter 4	
week13		Test of chapter 4	
	Protection of Motors, Bus-bar and Transmissio n Line Motor	Faults	
		Short circuit protection,	
week13		Overload protection	
		Single phase preventer.	
		Faults on Bus bar and Transmission Lines.	
		Bus bar protection: Differential and Fault bus protection.	
		Bus bar protection: Differential and Fault bus protection.	
		Transmission line: Over current protection	
		Transmission line: Distance protection.	
week 14		Transmission line: Pilot wire protection.	
		Revision	
		Revision	
		Revision	
		Revision	
		Revision	
week 15		Revision	

Sub Teacher

Neha

Neha Malhotra

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HOD

LESSON PLAN

SEM : 5TH

SUBJECT:ENERGY CONSERVATION AND AUDIT

S.NO	CHAPTER	TOPICS
week 1	UNIT: 1 Energy Conservation Basics Energy Scenario	Primary and Secondary Energy, Energy demand and supply, National scenario
week 2		Energy conservation and Energy audit; concepts and difference Star Labelling: Need and its benefits
week 3	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
week 4		Operating in star mode. Rewinding of motor. Replacement by energy efficient motor
week 5		Periodic maintenance Energy efficient motor; significant features, advantages, applications and limitations.
week 6		. Need for energy conservation in transformer: Energy efficient transformers, amorphoustransformers; epoxy Resin cast transformer / Dry type of transformer
week 7	UNIT: 3 Energy conservation in Electrical Installation systems	Aggregated Technical and commercial losses (ATC); Power system at state, regional, national and global level. Technical losses
week 8		causes and measures to reduce these (no expression only theory part) a) Controlling I 2R losses. b) Optimizing distribution voltage c) Balancing phase currents
week 9		Energy conservation in lighting sources: a) Replacing Lamp sources. b) Using energy efficient luminaries.
week 10	UNIT: 4 Energy conservation through Cogeneration and Tariff	Co-generation and Tariff; concept, significance for energy conservation Co-generation Types of cogeneration on basis of sequence of energy use
week 11		(basic introduction to Topping cycle & Bottoming cycle) Types of cogeneration basis of technology (Steam turbine cogeneration, Gas turbine cogeneration)
week 12		Factors governing the selection of cogeneration system, advantages of cogeneration

week 13	UNIT: 5 Energy Audit of Electrical System	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
week 14		Energy audit (definition as per Energy Conservation Act)Energy audit instruments and their use Questionnaire for energy audit projects.Energy flow diagram (Sankey diagram)
week 15		Revision

PUNEETA THAKUR
SR. LECTURER (EE)

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LESSON PLAN

Course: INDUSTRIAL AUTOMATION AND CONTROL (EEPE301-ii)
Number of Credits: 3 (L:3, T:0, P:0)
Total Time Allotted: 80 Hours

Week	Date Range	Unit	Topic	Time Allotted (Hours)
1	Aug 4 - Aug 10	Unit I	Introduction to automation, benefits, and types (Fixed, Programmable, Flexible).	4
2	Aug 11 - Aug 17	Unit I	Introduction to different systems used for Industrial automation: PLC, HMI, SCADA, DCS, Drives. Evolution of PLC.	4
3	Aug 18 - Aug 24	Unit I	Remaining topics from Unit I	4
4	Aug 25 - Aug 31	Unit II	Building blocks of PLC: CPU, Memory organization, Input-output modules, Power supply.	4
5	Sep 1 - Sep 7	Unit II	Fixed and Modular PLC and their types. Redundancy in PLC modules.	4
6	Sep 8 - Sep 14	Unit II	I/O module selection criteria.	4
7	Sep 15 - Sep 21	Unit III	PLC I/O addressing. Introduction to Relay type and Timer instructions (On delay, Off delay, Retentive).	5.5
8	Sep 22 - Sep 28	Unit III	Counter instructions (Up, Down, High speed), Logical and Comparison Instructions.	5.5
9	Sep 29 - Oct 5	Unit III	Data handling, Arithmetic instructions. Introduction to Ladder Programming and other PLC languages (FBD, IL, ST, SFC).	5.5
10	Oct 6 - Oct 12	Unit III	PLC Based Applications: Motor sequence control, Traffic light control.	5.5
11	Oct 13 - Oct 19	Unit IV	Electric drives: Types, functions, characteristics, four quadrant operation.	3.5
12	Oct 20 - Oct 26	Unit IV	DC and AC drive controls: V/F control, Parameters, direct torque control. Applications.	3.5
13	Oct 27 - Nov 2	Unit IV	Remaining topics from Unit IV	3.5
14	Nov 3 - Nov 9	Unit IV	Remaining topics from Unit IV	3.5
15	Nov 10 - Nov 16	Unit V	Introduction to SCADA, architecture, benefits.	4
16	Nov 17 - Nov 23	Unit V	Interfacing SCADA with PLC: OPC architecture, Creating SCADA screens and linking tags.	4
17	Nov 24 - Nov 26	Unit V	Applications of SCADA: Traffic light, water distribution, pipeline control.	4
			Total Hours	80

01.08.2025
SUBJECT TEACHER

HOD(EE)

Government Polytechnic Sundernagar, Distt. Mandi H.P.- 175018
Department of Electrical Engineering

LESSON PLAN

Name of the Faculty: Abhishek Bhardwaj Subject:. TI&CM Class:Elect.Engg.(5th sem)

Sr. No.	Month	Week	Name of the chapter	Contents to be taught	Remarks
1	August	1	Fundamentals of instrumentation	Basic purpose of instrumentation,Basic block diagram (transduction, signal conditioning, signal presentation) and their function.	
2		2		Brief introduction to switching devices- Push button, limit switch, float switch.	
3		3		Brief introduction to switching devices- pressure switch, thermostat, electromagnetic relay.	
4		4	Transducers	Primary and Secondary, Electrical and Mechanical, Analog and Digital Transducers	
5	September	1		Active and Passive transducers, Advantages of electric transducers,Required characteristics of transducers	
6		2		Factors affecting the choice of transducers, Brief introduction to resistive transducers.	
7		3		Brief introduction to Inductive transducers. Applications of transducers.	
8		4	Signal Conditioning	Basic Concept of signal conditioning System, pin configuration of IC 741, Ideal OP-AMP and Electrical Characteristics of OP-AMP, Different Parameters of op-amp:-Input offset voltage, Input offset current, Input bias current.	
9		1		Differential input resistance, CMMR, SVRR, voltage gain, output voltage, slew rate, gain bandwidth, Output, short circuit current,	

	October	2	Data Acquisition System	Generalized DAS- Block diagram and description of Transducer, signal conditioner, multiplexer, converter and recorder ,Single Channel and Multi-channel DAS- Block diagram only. Difference between Signal Channel and Multi-Channel DAS.	
11		3		Data conversion- Construction and Working of Analog to digital conversion- successive approximation method.	
12		4		Digital to Analog conversion- Construction and Working of binary weighted resistance method, Concept and methods of data transmission of electrical and electronic transmission.	
13	November	1	Condition Monitoring and Diagnostic Analysis	Definition of condition monitoring, Insulation deterioration Mechanism- factors affecting occurrence and rate of deterioration, types of stresses responsible for deterioration	
14		2		House tests (Centralised)	
15		3		Different tests on transformer, their purpose, and the necessary condition of machines, Tests on Circuit breaker, purpose and required condition of machine.	
16		4		Revision	

Signature of the teacher

H.O.D

Government Polytechnic Sundernagar

Lesson Plan for Session Aug 2025- Nov2025

Subject: IeGov Class: 6th Sem Electrical Engg. Subject Teacher: Kumari Neena

Sr. No.	Month	Week	Date	Name of Unit	Contents to be Taught
1	August	1		UNIT-1	Introduction to e-Governance,Exposure to emerging trends in ICT for development; Understanding of design and implementation of e-Government projects,e-governance lifecycle.
2		2	4th,5th,6th,7th		
3		3	11th,12th,13th,14th		
4		4	18th,19th,20th,21th	Unit-2	Need for Government Process Re-engineering (GPR); National e-Governance Plan(NeGP) for India; SMART Governments & Thumb Rules
5		5	25th,26th,27th,28th		
6	September	1	1st,2nd,3rd,4th		
7		2	8th,9th,10th,11th(Class Test-1)	Unit-3	Architecture and models of e-Governance, including Public Private Partnership (PPP); Need for Innovation and Change Management in eGovernance; Critical Success Factors; Major issue including corruption, resistance for change, e-Security and Cyber laws
8		3	15th,16th,17th,18th		
9		4	22nd,23rd,24th,25th		
10		5	29th,30th		
11	October	1	1st,2nd(Holiday)		
12		2	6th,7th,8th,9th	Unit-4	Focusing on Indian initiatives and their impact on citizens; Sharing of case studies to highlight best practices in managing e-Governance projects in Indian context. Visits to local e-governance sites(CSC, eSeva, Post Office, Passport Seva Kendra, etc) as part of Tutorials.
13		3	13th,14th,15th (class Test-2)		
14		4	21st,22nd		
15		5	27th,28th,29th,30th		
16	November	1	3rd,4th,6th	Unit-5	Mini Projects by students in groups – primarily evaluation of various e-governance project
17		2	1oth,11th,12th,13th (House Test)		
18		3	17th,18th,19th,20th		
19		4	24th,25th,26th		

Signature of Subject Teacher