GOVT. POLYTECHNIC SUNDERNAGAR

LESSON PLAN SUBJECT- IEGS SEM: 3rd

S.NO	CHAPTER	TOPICS	REMARKS
week 1	THERMAL POWER PLANT: COAL,GAS,DIESAL AND NUCLEAR BASED	Layout and working of a typical thermal power plant with steam turbines and electric generators	
		Properties of conventional fuels used in the energy conversion equipment used in thermal power plants: Coal,	
		Gas/diesel, nuclear fuels–fusion and fission action.	
		Safe Practices and working of various thermal power plants: coal-based	
week2		gas-based	
		diesel-based	
		nuclearbased.	
week3		Functions of the following types of thermal power plants and their major auxiliaries: Coal fired boilers	
		fire tube and water tube,Gas/diesel based combustion engines.	
		Gas/diesel based combustion engines. Types of nuclear reactors:	
		Disposal of nuclear waste and nuclear shielding.Thermal power plants	
week 4	LARGE AND MICRO HYDRO PLANTS	Energy conversion process of hydro power plant.	
		Classification of hydro power plant: High	
		medium and lowhead	
		Construction and working of hydro turbines used in different types of hydro power plant	
		High head – Pelton turbine	
		Medium head – Francis turbine	
		Low head – Kaplan turbine.	
week5		Safe Practices for hydro power plants.	
		Different types of micro- hydro turbinesfor different heads: Pelton, Francis and Kaplan turbines	
		Different types of micro- hydro turbinesfor different heads: Kaplan turbines	
		Locations of these different types of large and micro-hydro power plants in Himachal	
		Locations of these different types of large and micro-hydro power plants in Himachal	
		Potential locations of micro-hydro power plants in Himachal	
week6		Potential locations of micro-hydro power plants in Himachal	
		Solar Map of India: Global solar power radiation. Solar Power Technology	
		Concentrated Solar Power (CSP) plants, construction and working of: Power Tower	

week7	SOLAR AND BIOMASS BASED POWEPLANT	Parabolic Trough, Parabolic Dish, Fresnel Reflectors	
		Solar Photovoltaic (PV) power plant: layout, construction,WORKING	
		Biomass-based Power Plants	
week8		Layout of a Bio-chemical based (e.g. biogas) power plant Layout of a Thermo-chemical based (e.g. Municipal waste) power plant	
		Layout of an Agro-chemical based (e.g. bio-diesel) power plant Features of the solid, liquid and gas biomasses as fuel for biomass power plant.	
		Features of the solid, liquid and gas biomasses as fuel for biomass power plant.	
week9		Features of the solid, liquid and gas biomasses as fuel for biomass power plant.	
		Revision	
week 10	WIND POWER PLANT	Wind Power Plants Wind Map of India: Wind power density in watts per square meter	
		Layout of Horizontal axis large wind power plant:	
		Geared wind power plant	
week11		Direct-drive wind power plant.	
		Salient Features of electric generators used in large wind power plants: Constant Speed Electric Generators: Squirrel Cage Induction Generators (SCIG)	
		Wound Rotor Induction Generator (WRIG) Variable Speed Electric Generators: Doubly-fed induction generator (DFIG)	
week12		wound rotor synchronousgenerator (WRSG	
		permanent magnet synchronous generator (PMSG) Related terms: connected load, firm power, cold reserve, hot reserve, spinning reserve. Base load and peak load plants; Load curve, load	
week 13	ECONOMICS OF POWER GENERATION AND INTERCONNECTED POWER SYSTEM	integrated duration curve Cost of generation Average demand, maximum demand, demand factor, plant capacity factor, plant use factor, diversity factor, load factor and plant load Choice of size and number of generator units, combined operation of power station.	
		Causes, Impact and reasons of Grid system fault: State grid	
		Causes, Impact and reasons of Grid system fault: National grid	
week 14		brown-out and black-out	
		sample blackouts at national and international level.	

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week 15	Revision	Revision
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HOD

Sub Teacher

Neha.

Neha Malhotra

Lecturer (EE)

LESSON PLAN

Course: ELECTRICAL CIRCUITS (EEPC205)
Number of Credits: 3 (L:3, T:0, P:0)
Total Time Allotted: 64 Hours

Week	Date Range	Unit	Topic	Time Allotted (Hours)
1	Aug 1 - Aug 7	Unit I	Generation of alternating voltage; Phasor representation; R, L, C circuit elements and response	3
2	Aug 8 - Aug 14	Unit I	R-L and R-C series A.C. circuits; impedance, reactance, impedance triangle	3
3	Aug 15 - Aug 21	Unit I	R-L-C series A.C. circuits; Power factor, active, reactive, apparent power, power triangle	3
4	Aug 22 - Aug 28	Unit I	Series Resonance, Bandwidth, Quality factor, voltage magnification	3
5	Aug 29 - Sep 4	Unit II	R-L and R-C parallel A.C. circuits; Phasor diagrams	3
6	Sep 5 - Sep 11	Unit II	R-L-C parallel A.C. circuits; impedance, reactance, impedance triangle for parallel circuits	3
7	Sep 12 - Sep 18	Unit II	Power factor, active, reactive, apparent power, power triangle for parallel circuits	3
8	Sep 19 - Sep 25	Unit II	Parallel Resonance, Bandwidth, Quality factor, current magnification	3
9	Sep 26 - Oct 2	Unit III	Three-phase supply; Phasor and complex representation; Phase sequence and polarity	3.5
10	Oct 3 - Oct 9	Unit III	Star and Delta connections; Phase and line quantities	3.5
11	Oct 10 - Oct 16	Unit III	Balanced three-phase loads; Power measurement	3.5
12	Oct 17 - Oct 23	Unit III	Unbalanced three-phase loads; Neutral shift calculation	3.5
13	Oct 24 - Oct 30	Unit IV	Source transformation; Star/delta and delta/star transformations	3
14	Oct 31 - Nov 6	Unit IV	Mesh Analysis; Node Analysis	3
15	Nov 7 - Nov 13	Unit V	Superposition theorem; Thevenin's theorem	3.5
16	Nov 14 - Nov 20	Unit V	Norton's theorem; Maximum power transfer theorem	3.5
17	Nov 21 - Nov 26	Unit V	Reciprocity theorem; Duality in electric circuits; Revision	3.5
			Total Hours	64

02.02.2025
SUBJECT TEACHER
Avnish Paul

HOD(EE)

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

LESSON PLAN

Name of the Faculty: Abhishek Bhardwaj | Subject:EE&M | Class:Elect.Engg.(3rd sem)

Sr. No	Month	Week	Name of the chapter	Contents to be taught	Remarks
1	August	1	Fundamentals of Measurements	Measurement: Significance, units, fundamental quantities and standards Classification of Instrument Systems	
2		2		Static and dynamic characteristics, types of errors, Calibration: need and procedure	
3		3		Classification of measuring instruments: indicating, recording and integrating instruments. Essential requirements of an indicating instruments	
4		4	Measurement of voltage and current	DC Ammeter: Basic, Multi range, Universal shunt, DC Voltmeter: Basic, Multi-range	
5	September	1		Concept of loading effect and sensitivity AC voltmeter: Rectifier type (half wave and full wave), CT and PT: construction, working and applications. Clamp-on meter	
6		2	Measurement of Electric Power	Analog meters: Permanent magnet moving coil (PMMC) and Permanent magnet moving iron (PMMI) meter, their construction, working, salient features, merits and demerits, Dynamometer type wattmeter: Construction and working	
7		3		Multiplying factor and extension of range using CT and PT Errors and compensations. Active and reactive power measurement: One, two and three wattmeter method.	
8		4		Effect of Power factor on wattmeter reading in two wattmeter method. Maximum Demand indicator	
			Measurement of Electric Energy	Single and three phase electronic energy meter: Constructional features and working principle,Errors and their compensations	
				Calibration of single phase electronic energy meter using direct loading.	
9		1		Measurement of resistance: Low resistance: Kelvin's double bridge, Medium Resistance: Voltmeter and ammeter method, High resistance: Megger and Ohm meter	

10	October	2	Circuit Parameter Measurement, CRO and Other Meters	Measurement of inductance using Anderson Bridge,Measurement of capacitance using Schering bridge	
11		3		Single beam/single trace CRO, Digital storage Oscilloscope: Basic block diagram, working	
12		4		Measurement of voltage/ amplitude/ time period/ frequency/ phase angle delay line, Earth tester, Digital Multi-meter	
13	November	1		L-C-R meter, Frequency meter (ferromagnetic and Weston type), Phase sequence indicator, power factor meter (single phase and three phase dynamometer type)	
14		2		Houe tests (Centralised)	
15		3		Synchroscope, Tri-vector meter, Signal generator	
16		4		Function generator: need, working and basic block diagram, function of symmetry	

Signature of the teacher

H.O.D

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

LESSON PLAN

Name of the Faculty: Rajesh Chaudhary Subject: (EM&T) Class:Elect.Engg.(3rd sem)

Sr. No.	Month	Week	Name of the chapter	Contents to be taught	Remarks
1	August	1	DC Generators	DC generator: construction, parts, materials and their functions. Principle of operation of DC generator: Fleming's right hand rule	
2		2		schematic diagrams, e.m.f. equation of generator, armature reaction, commutation and Applications of DC generators.	
3		3	D.C. Motors	DC motor: Types of DC motors, Fleming's left hand rule, Principle of operation, Back e.m.f. and its significance	
4		4		Voltage equation of DC motor. Torque and Speed, Armature torque, Shaft torque, BHP, Brake test, losses, efficiency.DC motor starters: Necessity, two point and three point starters.	
5	September	1		Speed control of DC shunt and series motor: Flux and Armature control. Brushless DC Motor: Construction and working.	
6		2	Single Phase Transformers	Types of transformers: Shell type and core type; Construction: Parts and functions, materials used for different parts: CRGO, CRNGO, HRGO, amorphous cores.	
7		3		Transformer: Principle of operation, EMF equation of transformer: Derivation, Voltage transformation ratio, Significance of transformer ratings	
8		4		Transformer No-load and on-load phasor diagram, Leakage reactance, Equivalent circuit of transformer: Equivalent resistance and reactance.Voltage regulation and Efficiency: Direct loading, OC/SC method, All-day efficiency	
9		1		Bank of three single phase transformers, Single unit of three phase transformer.Distribution and Power transformers, Construction, cooling, Three phase transformers connections as per IS:2026 (part IV)-1977	

10	October	2	Three Phase Transformers	Three phase to two phase conversion (Scott Connection), Selection of transformer as per IS: 10028 (Part I)-1985	
11		3		Criteria for selection of distribution transformer, and power transformer, Amorphous Core type Distribution Transformer, Specifications of three-phase distribution transformers as per IS:1180 (part I)-1989	
12		4		Need of parallel operation of three phase transformer, Conditions for parallel operation. Polarity tests on mutually inductive coils and single phase transformers; Polarity test, Phasing out test on Three-phase transformer	
13	November	1	Special Purpose Transformers	Single phase and three phase auto transformers: Construction, working and applications.Instrument Transformers: Construction, working and applications of Current transformer and Potential transformer.	
14		2		House tests(Centralised)	
15		3		Isolation transformer: Constructional Features and applications.Single phase welding transformer: constructional features and applications. Pulse transformer: constructional features and applications.	
16		4		'K' factor of transformers: overheating due to non-linear loads and harmonics. Revision	

01/08/25

Signature of the teacher

Rajesh Chaudhary

H.O.D

LESSON PLAN

SEM : 3RD

SUBJECT :ELECTRONICS DEVICES AND CIRCUITS

S.NO	CHAPTER	TOPICS
week 1	UNIT1 Semiconductor and Diodes	Definition, Extrinsic/Intrinsic, N-type & P-typeSemiconductor and Diodes:. PN Junction Diode – Forward and Reverse Bias Characteristics
week 2		Zener Diode – Principle, characteristics, construction, and working. Diode Rectifiers – Half Wave and Full Wave
week 3		Filters – C, LC, and PI Filters
week 4	UNIT 2. Bipolar Junction Transistor (BJT)	NPN and PNP Transistor – Operation and characteristics.
week 5		Common Base Configuration – characteristics and working.
week 6		Common Emitter Configuration – characteristics and working. Common Collector Configuration – characteristics and working
week 7		High frequency model of BJT. Classification of amplifiers, negative feedback
week 8	UNIT 3. Field Effect Transistors: FET	Working Principle, Classification. MOSFET Small Signal model. N-Channel/ P-Channel MOSFETs – characteristics, enhancement, and depletion mode
week 9		MOS- FET as a Switch. Common Source Amplifiers. Uni-Junction Transistor – equivalent circuit and operation
week 10		SCR – Construction, operation, working, characteristics
week 11	UNIT 4. SCR DIAC &TRIAC	DIAC - Construction, operation, working, characteristics.TRIAC - Construction, operation, working, characteristics
week 12		SCR and MOSFET as a Switch, DIAC as bidirectional switch. Comparison of SCR, DIAC, TRIAC, MOSFET
week 13	UNIT 5. Amplifiers and Oscillators	Feedback Amplifiers – Properties of negative Feedback, impact of feedback on different parameters
		Basic Feedback Amplifier Topologies: Voltage Series, Voltage Shunt, Current Series, Current Shunt
week 14		Oscillator – Basic Principles, Crystal Oscillator, Non-linear/ Pulse Oscillator
week 15		REVISION

PUNEETA THAKUR
SR. LECTURER (EE)