

Department of Electrical Engineering

Lesson Plan

Name of Faculty	Mr. Amit Attri
Discipline	Electrical Engineering
Semester	3rd
Subject	EMT (1-5 Hrs./Week)
Lesson Plan Duration	August – December 2023

Week	Topic	Theory
1st (10Aug. - 18Aug.)	Unit – I DC Generators	DC generator: construction, parts, materials and their functions. Principle of operation of DC generator
2nd (19Aug. – 25Aug.)	Unit – I DC Generators	Fleming's right hand rule, schematic diagrams, e.m.f. equation of generator armature reaction, commutation and Applications of DC generators.
3rd (26Aug. – 01 Sept.)	Unit – II D.C. Motors	DC motor: Types of DC motors. Fleming's left hand rule, Principle of operation of, Back e.m.f. and its significance, Voltage equation of DC motor
4th (2Sept. –11Sept.)	Unit – II D.C. Motors	Torque and Speed; Armature torque, Shaft torque, BHP, Brake test, losses, efficiency.
5th (12 Sept. –18 Sept.)	Unit – II D.C. Motors	DC motor starters: Necessity, two point and three point starters. Speed control of DC shunt and series motor: Flux and Armature control. Brushless DC Motor: Construction and working
6th (19 Sept. – 25 Sept.)	Unit– III 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
Class Test – 1		In Fourth Week of September 2023.
7th (26 Sept. – 3 Oct)	Unit– III Single Phase Transformers	Transformer: Principle of operation, EMF equation of transformer: Derivation, Voltage transformation ratio, Significance of transformer ratings
8th (4Oct. – 10 Oct.)	Unit– III Single Phase Transformers	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.
9th (11 Oct. – 18 Oct.)	Unit– IV Three Phase Transformers	Bank of three single phase transformers, Single unit of three phase transformer. Distribution and Power transformers, Construction, cooling
10th (19 Oct. – 26 Oct.)	Unit– IV Three Phase Transformers	Three phase transformers connections as per IS:2026 (part IV)-1977, Three phase to two phase conversion (Scott Connection), Selection of transformer as per IS: 10028 (Part I)-1985,
Class Test – 2		In Fourth Week of October 2023.

11 th (27 Oct. – 03 Nov.)	Unit- IV Three Phase Transformers	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. Need of parallel operation of three phase transformer, Conditions for parallel operation
12 th (4 Nov. – 10 Nov.)	Unit- IV Three Phase Transformers	Polarity tests on mutually inductive coils and single phase transformers; Polarity test, Phasing out test on Three-phase transformer.
House Test		In Second Week of November 2023.
13 th (13Nov. – 18Nov.)	Unit V 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. Isolation transformer: Constructional Features and applications.
14 th (20 Nov. – 25 Nov.)	Unit V Special Purpose Transformers	Single phase welding transformer: constructional features and applications. Pulse transformer: constructional features and applications. 'K' factor of transformers: overheating due to non-linear loads and harmonics
15 th (28 Nov- 4 Dec)	Revision	Revision and doubt clearance

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

Signature of Teacher/Prepared by
(Er. Amit Attri)

Signature of HOD/OIC
(Er. Amit Attri)

R.G.Government Polytechnic Banikhet, Distt. Chamba H.P. 176303

Department of Electrical Engineering

Lesson Plan

Name of Faculty	Mr. X
Discipline	Electrical Engineering
Semester	3rd
Subject	IEGS (L-4 Hrs./Week)
Lesson Plan Duration	August – December 2023

Week	Topic	Theory
1 st (10Aug. - 18Aug.)	Unit – I Thermal Power Plants: Coal, Gas/ Diesel 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.
2 nd (19Aug. – 25Aug.)	Unit – I Thermal Power Plants: Coal, Gas/ Diesel and Nuclear-based	Safe Practices and working of various thermal power plants: coal-based, gas-based, diesel-based, nuclear-based. 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.
3 rd (26Aug. – 01 Sept.)	Unit – I Thermal Power Plants: Coal, Gas/ Diesel and Nuclear-based UNIT – II LARGE AND MICRO-HYDRO POWER PLANTS	Types of nuclear reactors: Disposal of nuclear waste and nuclear shielding. Thermal power plants in India. Energy conversion process of hydro power plant. Classification of hydro power plant: High, medium and low head
4 th (2Sept. –11Sept.)	UNIT – II LARGE AND MICRO-HYDRO POWER PLANTS	Construction and working of hydro turbines used in different types of hydro power plant: a. High head – Pelton turbine b. Medium head – Francis turbine c. Low head – Kaplan turbine.
5 th (12 Sept. –18 Sept.)	UNIT – II LARGE AND MICRO-HYDRO POWER PLANTS	Safe Practices for hydro power plants. Different types of micro- hydro turbines for different heads: Pelton, Francis and Kaplan turbines, Locations of these different types of large and micro-hydro power plants in Himachal. Potential locations of micro-hydro power plants in Himachal
6 th (19 Sept. – 25 Sept.)	UNIT– III SOLAR AND BIOMASS BASED POWER PLANTS	Solar Map of India: Global solar power radiation. <i>Solar Power Technology</i> a. Concentrated Solar Power (CSP) plants, construction and working of: Power Tower, Parabolic Trough,


Class Test – 1		In Fourth Week of September 2023
7 th (26 Sept. – 3 Oct.)	UNIT– III SOLAR AND BIOMASS BASED POWER PLANTS	<p>b. Parabolic Dish, Fresnel Reflectors</p> <p>c. Solar Photovoltaic (PV) power plant layout construction, working <i>Biomass- based Power Plants</i></p> <p>d. Layout of a Bio-chemical based (e.g. biogas) power plant:</p>
8 th (4 Oct. – 10 Oct.)	UNIT– III SOLAR AND BIOMASS BASED POWER PLANTS	<p>e. Layout of a Thermo-chemical based (e.g. Municipal waste) power plant</p> <p>f. 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.</p>
9 th (11 Oct. – 18 Oct.)	UNIT– IV WIND POWER PLANTS	<p>Wind Map of India: Wind power density in watts per square meter Layout of Horizontal axis large wind power plant:</p> <p>Geared wind power plant. Direct-drive wind power plant.</p>
10 th (19 Oct. – 26 Oct.)	UNIT– IV WIND POWER PLANTS	<p>Salient Features of electric generators used in large wind power plants:</p> <p>Constant Speed Electric Generators: Squirrel Cage Induction Generators (SCIG), Wound Rotor Induction Generator (WRIG)</p>
Class Test – 2		In Fourth Week of October 2023.
11 th (27 Oct. – 03 Nov.)	UNIT– IV WIND POWER PLANTS	<p>Variable Speed Electric Generators: Doubly-fed induction generator (DFIG), wound rotor synchronous generator (WRSG), permanent magnet synchronous generator (PMSG)</p>
12 th (4 Nov. – 10 Nov.)	UNIT– V ECONOMICS OF POWER GENERATION AND INTERCONNECTED POWER SYSTEM	<p>Related terms: connected load, firm power, cold reserve, hot reserve, spinning reserve. Base load and peak load plants; Load curve, load duration curve, integrated duration curve</p>
House Test		In Second Week of November 2023.
13 th (13 Nov. – 18 Nov.)	UNIT– V ECONOMICS OF POWER GENERATION AND INTERCONNECTED POWER SYSTEM	<p>Cost of generation: Average demand, maximum demand, demand factor, plant capacity factor, plant use factor, diversity factor, load factor and plant load factor.</p> <p>Choice of size and number of generator units, combined operation of power station Causes</p>
14 th (20 Nov. – 25 Nov.)	UNIT– V ECONOMICS OF POWER GENERATION AND INTERCONNECTED POWER SYSTEM	<p>Impact and reasons of Grid system fault: State grid, national grid, brown out and black out; sample blackouts at national and international level.</p>

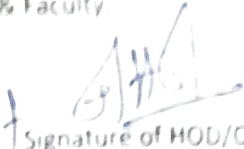
15th
(28 Nov - 4 Dec)

Revision

Revision and doubt clearance

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


Signature of Teacher/Prepared by
(Er. Divya)


Signature of HOD/OIC
(Er. Amit Attri)

Department of Electrical Engineering

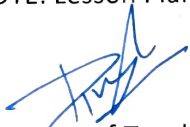
Lesson Plan

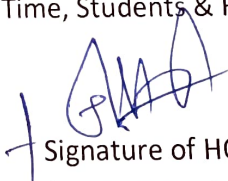
Name of Faculty	Dr. Divya
Discipline	Electrical Engineering
Semester	3rd
Subject	EC (1.5 Hrs./Week)
Lesson Plan Duration	August – December 2023

Week	Topic	Theory
1 st (10 Aug - 18 Aug.)	Unit – I Single Phase A.C Series Circuits	Generation of alternating voltage, Phasor representation of sinusoidal quantities R, L, C circuit elements its voltage and current response
2 nd (19 Aug - 25 Aug.)	Unit – I Single Phase A.C Series Circuits	R-L, R-C, R-L-C combination of A.C series circuit, impedance, reactance, impedance triangle, Power factor, active power, reactive power, apparent power
3 rd (26 Aug - 01 Sept.)	Unit – I Single Phase A.C Series Circuits	power triangle and vector diagram, Resonance, Bandwidth, Quality factor and voltage magnification in series R-L, R-C, RL-C circuit
4 th (2 Sept. - 11 Sept.)	Unit – II Single Phase A.C Parallel Circuits	R-L, R-C and R-L-C parallel combination of A.C. circuits. Impedance, reactance, phasor diagram, impedance triangle
5 th (12 Sept. - 18 Sept.)	Unit – II Single Phase A.C Parallel Circuits	R-L, R-C, R-L-C parallel A.C. circuits power factor, active power, apparent power, reactive power, power triangle
6 th (19 Sept. - 25 Sept.)	Unit – II Single Phase A.C Parallel Circuits	Resonance in parallel R-L, R-C, R-L-C circuit, Bandwidth, Quality factor and voltage magnification
Class Test – 1		In Fourth Week of September 2023.
7 th (26 Sept. - 3 Oct)	Unit– III Three Phase Circuits	Phasor and complex representation of three phase supply, Phase sequence and polarity Types of three-phase connections,
8 th (4 Oct. - 10 Oct.)	Unit– III Three Phase Circuits	Phase and line quantities in three phase star and delta system, Balanced and unbalanced load, neutral shift in unbalanced load
9 th (11 Oct. - 18 Oct.)	Unit– III Three Phase Circuits	Three phase power, active, reactive and apparent power in star and delta system

10 th (19 Oct. – 26 Oct.)	Unit– IV Network Reduction and Principles of Circuit Analysis	Source transformation, Star/delta
Class Test – 2		In Fourth Week of October 2023.
11 th (27 Oct. – 03 Nov.)	Unit– IV Network Reduction and Principles of Circuit Analysis	delta/star transformation & Mesh Analysis,
12 th (4 Nov. – 10 Nov.)	Unit– IV Network Reduction and Principles of Circuit Analysis	Node Analysis
	Unit– V Network Theorems	Superposition theorem.
House Test		In Second Week of November 2023.
13 th (13Nov. – 18Nov.)	Unit– V Network Theorems	Thevenin's theorem. Norton's theorem
14 th (20 Nov. – 25 Nov.)	Unit– V Network Theorems	Maximum power transfer theorem Reciprocity theorem. Duality in electric circuits.
15 th (28 Nov- 4 Dec)	Revision	Revision and doubt clearance

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Signature of Teacher
(Er. Divya)


Signature of HOD/OIC
(Er. Amit Attri)

Department of Electrical Engineering

Lesson Plan

Name of Faculty

Mr. X

Discipline

Electrical Engineering

Semester

3rd

Subject

EEM (L-4 Hrs./Week)

Lesson Plan Duration

August – December 2023

Week	Topic	Theory
1 st (10Aug. - 18Aug.)	Unit – I Fundamentals of Measurements	Measurement: Significance, units, fundamental quantities and standards Classification of Instrument Systems
2 nd (19Aug. – 25Aug.)	Unit – I Fundamentals of Measurements	Null and deflection type instruments Absolute and secondary instruments Analog and digital instruments. Static and dynamic characteristics, types of errors,
3 rd (26Aug. – 01 Sept.)	Unit – I Fundamentals of Measurements	Calibration: need and procedure Classification of measuring instruments: indicating, recording and integrating instruments. Essential requirements of an indicating instruments.
4 th (2Sept. –11Sept.)	Unit – II Measurement of voltage and current	DC Ammeter: Basic, Multi range, Universal shunt, DC Voltmeter: Basic
5 th (12 Sept. –18 Sept.)	Unit – II Measurement of voltage and current	Multi-range, concept of loading effect and sensitivity AC voltmeter Rectifier type (half wave and full wave).
6 th (19 Sept. – 25 Sept.)	Unit – II Measurement of voltage and current Unit– III Measurement of Electric Power	CT and PT: construction, working and applications. Clamp-on meter Analog meters: Permanent magnet moving coil (PMMC) and Permanent magnet moving iron (PMMI) meter, their construction, working, salient features, merits and demerits
Class Test – 1		In Fourth Week of September 2023.
7 th (26 Sept. – 3 Oct)	Unit– III Measurement of Electric Power	Dynamometer type wattmeter: Construction and working Range: 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 th (4 Oct. – 10 Oct.)	Unit- III Measurement of Electric Power	Effect of Power factor on wattmeter reading in two wattmeter method. Maximum Demand indicator
9 th (11 Oct. – 18 Oct.)	Unit- IV Measurement of Electric Energy	Single and three phase electronic energy meter. Constructional features and working principle. Errors and their compensations.
10 th (19 Oct. – 26 Oct.)	Unit- IV Measurement of Electric Energy	Calibration of single phase electronic energy meter using direct loading.
Class Test – 2		In Fourth Week of October 2023.
11 th (27 Oct. – 03 Nov.)	Unit- V Circuit Parameter Measurement, CRO and Other Meters.	Measurement of resistance: Low resistance: Kelvin's double bridge. Medium Resistance: Voltmeter and ammeter method. High resistance: Megger and Ohm meter. Series and shunt Measurement of inductance using Anderson bridge (no derivation and phasor diagram). Measurement of capacitance using Schering bridge (no derivation and phasor diagram).
12 th (4 Nov. – 10 Nov.)	Unit- V Circuit Parameter Measurement, CRO and Other Meters.	Single beam/single trace CRO, Digital storage Oscilloscope: Basic block diagram, working, Cathode ray tube, electrostatic deflection, vertical amplifier, time base generator
House Test		In Second Week of November 2023.
13 th (13 Nov. – 18 Nov.)	Unit- V Circuit Parameter Measurement, CRO and Other Meters.	horizontal amplifier, measurement of voltage/ amplitude/ time period/ frequency/ phase angle delay line, specifications. Other meters: Earth tester, Digital Multimeter; L-C-R meter, Frequency meter (ferromagnetic and Weston type)
14 th (20 Nov. – 25 Nov.)	Unit- V Circuit Parameter Measurement, CRO and Other Meters.	Phase sequence indicator, power factor meter (single phase and three phase dynamometer type), Synchroscope, Tri-vector meter, Signal generator need, working and basic block diagram. Function generator: need, working and basic block diagram, function of symmetry.
15 th (28 Nov- 4 Dec)	Revision	Revision and doubt clearance

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Name of Faculty	Er. Divya
Discipline	Electrical Engineering
Semester	3rd
Subject	EDC (L-4 Hrs./Week)
Lesson Plan Duration	August – December 2023

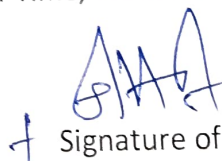
Week	Topic	Theory
1 st (10Aug. - 18Aug.)	Unit 1 Semiconductor and Diodes	Definition, Extrinsic/Intrinsic, N-type & p-type PN Junction Diode – Forward and Reverse Bias
2 nd (19Aug. – 25Aug.)	Unit 1 Semiconductor and Diodes	Characteristics Zener Diode – Principle, characteristics, construction, working
3 rd (26Aug. – 01 Sept.)	Unit 1 Semiconductor and Diodes Unit 2 Bipolar Junction Transistor (BJT)	Diode Rectifiers – Half Wave and Full Wave Filters – C, LC and PI Filters NPN and PNP Transistor – Operation and characteristics
4 th (2Sept. –11Sept.)	Unit 2 Bipolar Junction Transistor (BJT)	Common Base Configuration – characteristics working Common Emitter Configuration
5 th (12 Sept. –18 Sept.)	Unit 2 Bipolar Junction Transistor (BJT)	characteristics and working Common Base Configuration characteristics and working High frequency model of BJT Classification of amplifiers, negative feedback
6 th (19 Sept. – 25 Sept.)	Unit 3 Field Effect Transistors FET	Working Principle, Classification MOSFET
Class Test – 1		In Fourth Week of September 2023.
7 th (26 Sept. – 3 Oct)	Unit 3 Field Effect Transistors FET	Classification MOSFET Small Signal model N-Channel/ P- Channel MOSFETs – characteristics enhancement and depletion mode

8 th (04 Oct. – 10 Oct.)	Unit 3 Field Effect Transistors FET	MOSFET as a Switch Common Source Amplifiers Uni-Junction Transistor – equivalent circuit and operation
9 th (11 Oct. – 18 Oct.)	Unit 4 SCR DIAC & TRIAC	SCR – Construction, operation, working, characteristics DIAC – Construction, operation, working, characteristics
10 th (19 Oct. – 26 Oct.)	Unit 4 SCR DIAC & TRIAC	TRIAC – Construction, operation, working, characteristics
Class Test – 2		In Fourth Week of October 2023.
11 th (27 Oct. – 03 Nov.)	Unit 4 SCR DIAC & TRIAC	SCR and MOSFET as a Switch
12 th (4 Nov. – 10 Nov.)	Unit 4 SCR DIAC & TRIAC	DIAC as bidirectional switch Comparison of SCR, DIAC, TRIAC, MOSFET
House Test		In Second Week of November 2023.
13 th (13 Nov. – 18 Nov.)	Unit 5 Amplifiers and Oscillators	Feedback Amplifiers – Properties of negative Feedback impact of feedback on different parameters Basic Feedback Amplifier Topologies: Voltage Series
14 th (20 Nov. – 25 Nov.)	Unit 5 Amplifiers and Oscillators	Voltage Shunt Current Series, Current Shunt Oscillator Basic Principles, Crystal Oscillator, Non-linear/ Pulse Oscillator
15 th (28 Nov- 4 Dec)	Revision	Revision and doubt clearance

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