

Lesson Plan

Name of the faculty : Hitesh Aggarwal
Discipline : Mechanical Engineering
Semester : 3rd Semester
Subject : **BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING**
Work Load : (L/P) (3 Periods/ 2 periods) /Week

		Theory	Practical
Week	Lecture Day	Topics	Topics
1 st	1 st	Unit 1 Application and Advantage of Electricity- Difference between ac and dc, various applications of electricity	1 st Connection of a three-phase motor and starter with fuses and reversing of direction of rotation
	2 nd	advantages of electrical energy over other types of energy	
	3 rd	Unit 2 Basic Electrical Quantities- Definition of voltage, current, power and energy with their unit	
	4 th	name of instruments used for measuring above	
2 nd	5 th	connection of these instruments in an electric	2 nd Connection of a single-phase induction motor with supply and reversing of its direction of rotation
	6 th	Unit 3 AC Fundamentals- Electromagnetic induction-Faraday's Laws, Lenz's Law;	
	7 th	Principles of a.c. Circuits; Alternating emf,	
	8 th	amplitude and time period. Instantaneous, average	
3 rd	9 th	r.m.s and maximum value of sinusoidal wave	3 rd Troubleshooting in domestic wiring system, including distribution board
	10 th	form factor and Peak Factor. Concept of phase and phase	
	11 th	difference. Concept of resistance,	
	12 th	inductance and capacitance in simple a.c. circuit	
4 th	13 th	power factor and improvement of power factor by use of capacitors.	4 th Connection and reading of an electric energy meter
	14 th	Concept of three phase system	
	15 th	star and delta connections	
	16 th	voltage and current relationship (no derivation)	
5 th	17 th	Definition of cycle, frequency	5 th Use of ammeter, voltmeter, wattmeter, and multi-meter
	18 th	Unit 4 Transformers-<u>Introduction</u>	

	19 th	Working principle and construction of single phase transformer	
	20 th	SESSIONAL I	
6 th	21 st	transformer ratio, emf equation	6 th Measurement of power and power factor in a given single phase ac circuit
	22 nd	losses and efficiency, cooling of transformers	
	23 rd	isolation transformer, CVT	
	24 th	auto transformer (brief idea), applications.	
7 th	25 th	Unit 5 Distribution System-Introduction	7 th Study of different types of fuses, MCBs and ELCBs
	26 th	Difference between high and low voltage distribution system, identification of three-phase wires	
	27 th	neutral wire and earth wire in a low voltage distribution system.	
	28 th	Identification of voltages between phases	
8 th	29 th	between one phase and neutral. Difference between three-phase and single-phase supply	8 th Study of zener diode as a constant voltage source and to draw its V-I characteristics
	30 th	Unit 6 Electric Motor- Description and applications of single-phase and three-phase	
	31 st	Connection and starting of three-phase induction motors by star-delta starter	
	32 nd	Changing direction of rotation of a given 3 phase	
9 th	33 rd	Motors used for driving pumps	9 th Study of earthing practices
	34 th	compressors, centrifuge, dyers etc.	
	35 th	Totally enclosed submersible and flame proof	
	36 th	Unit 7 Domestic Installation- Introduction	
10 th	37 th	[Simple problems on the above topics]	10 th To draw V-I characteristics of a (i) NPN transistor
	38 th	Distinction between light-fan circuit	
	39 th	SESSIONAL II	
	40 th	single phase power circuit, sub-circuits	
11 th	41 st	various accessories and parts of domestic electrical installation	11 th To draw V-I characteristics of (ii) thyristor (SCR)
	42 nd	Identification of wiring systems	
	43 rd	Common safety measures and earthing	
	44 th	Unit 8 Electrical Safety-Introduction	
12 th	45 th	Electrical shock and precautions against shock	Study of construction and working of a (i) stepper motor and
	46 th	treatment of electric shock	
	47 th	concept of fuses and their classification	

	48 th	selection and application,	
13 th	49 th	concept of earthing and various types of earthing	Study of construction and working of a (ii) servo motor
	50 th	applications of MCBs and ELCBs	
	51 st	Unit 9 Basic Electronics	
	52 nd	Basic idea of semiconductors – P and N type	
14 th	53 rd	diodes, zener diodes and their applications	REVISION OF PRACTICALS
	54 th	transistor – PNP and NPN	
	55 th	their characteristics and uses.	
	56 th	Characteristics and applications of a thyristor	
15 th	57 th	characteristics and applications of stepper motors	VIVA-VOCE
	58 th	servo motors in process control.	
	59 th	REVISION OF SYLLABUS	
	60 th	SESSIONAL TEST –III	