Lesson Plan

Name of the faculty : **Guest Faculty**

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

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

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