

GANPAT UNIVERSITY										
FACULTY OF ENGINEERING & TECHNOLOGY										
Programme		Diploma Engineering				Branch		Electrical Engineering		
Semester		IV				Version		1.0.0.0		
Effective from Academic Year			2019-20			Effective for the batch Admitted in			June 2018	
Subject code		1EE2403		Subject Name		ELECTRICAL ENERGY UTILIZATION				
Teaching scheme					Examination scheme (Marks)					
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total	
	L	TU	P	TW						
Credit	4	0	1	0	5	Theory	40	60	100	
Hours	4	0	2	0	6	Practical	30	20	50	

Pre-requisites:									
None									

Course Learning Outcomes:									
The course content should be taught and implemented with an aim to develop different skills leading to the achievement of the following competencies and course learning outcomes:									
Proper utilization and Maintain various luminaries available in our market.									
Maintain various electric heating and welding equipment's used in industries.									
Maintain Electric Drives and elevators used in industries.									
Maintain Electric Traction system.									
Maintain various domestic electrical appliances.									
The practical should be carried out in such a manner that students are able to acquire different learning out comes in cognitive, psychomotor and affective domain to demonstrate course learning outcomes.									

Course Content				
Name of UNIT	Unit Content	Unit Learning Outcomes	Marks	Hrs
Illumination	1.1 Various illumination terms and its units 1.2 Laws of illumination 1.3 Working Principles and applications of the various luminaries available in local market.	1a. Illumination terms : Luminous Flux, Luminous Intensity, Lumen, Candle Power, Lux, Lamp Efficiency, Space-Height Ratio, Utilization Factor, Absorption Factor, Reflection factor 1b. Inverse Square Law and Lambert's Cosine Law 1c. Incandescent Lamp, Fluorescent Tube, High Pressure Mercury Vapour Lamp(HPMV), High Pressure Sodium Vapour Lamp (HPSV), Compact Fluorescent Lamps (CFL), Halogen Lamps, Metal Halide lamp, LED lamp, Electronic ballasts	15	15
Electrical Heating and Welding	2.1 Requirements of heating element materials 2.2 Working principles, types and applications of different electrical heating. 2.3 Working principles and types of different electrical Welding.	2a. Requirements of heating element materials 2b. Resistance Heating : Principle , types and application 2c. Arc Heating : Principle , types and application 2d. Induction Heating : Principle , types and application 2e. Dielectric Heating : Principle , types and application 2f. Resistance Welding : Principle and types 2g. Arc welding : Principle and types	10	10
Electric Drives And Elevators	3.1 Factors governing selection of electric motors in a electric drive 3.2 Characteristics of various motors 3.3 Differentiate Individual & Group drive 3.4 Various types of elevator machines and their motors. 3.5 Salient features of the latest Lift and elevator act	3a. Nature of load torque for various applications 3b. Speed Torque Characteristics of the Motor 3c. Individual & Group Drive 3d. Types of electric elevator machines and their motors 3e. Power transmission gears and braking 3f. Safety in elevators and relevant act	10	10
Electric Traction	4.1 Concept of Electric Traction and the ideal conditions 4.2 Various supply system for traction	4a. Requirements of ideal Traction System. 4b. Traction Mechanics: Types of Services, Speed Time Curve. 4c. Supply system: DC System, Composite System, Single Phase ac system with low and normal frequency and 3 phase system	10	10
Domestic Electrical Appliances	5.1 Working of various domestic electrical appliances in use. 5.2 Energy conservation measures adopted in using various domestic gadgets.	5a. Domestic electrical appliances: 1. Electric iron. 2. Electric toaster. 3. Electric water heater. 4. Microwave oven. 5. Fans (Ceiling and Table fan) 6. Washing Machine. 7. Grinder/ Mixer/ juicer. 8. Vacuum Cleaner.	15	15

		9. Flour Mill etc. 10. Air conditioner 5b. Concept of Star System for energy conservation		
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List of Practical		
No.	Unit	Name of Practical
1	I	Measure Illumination at different places in college by using Luxmeter.
2	I	Prepare a report on various types of luminaries available in the market & collect the technical data of each luminary.
3	I	Prepare an Industrial visit report after visiting nearby lamp manufacturing industry. (otherwise from internet)
4	II	Prepare a report of specification of various heating furnaces used in Industries.
5	II	Prepare a report of specification of various electrical welding machines available in college workshop.
6	III	Prepare a report on comparison of various types of electric drives for traction.
7	III	Prepare a report on various elevators after visiting nearby elevators manufacturing / repairing industry. (otherwise from internet)
8	IV	Prepare a report after visiting nearby electric-traction substation. (otherwise from Internet)
9	IV	Prepare a report on Speed time curves for different types of traction system.
10	V	Prepare a report on various parts and their function of any two different Domestic appliances.
11	V	Prepare a report on procedure for servicing of any two domestic appliances.
12	V	Prepare a comparative report of two different manufacturing companies in India of any two

		electrical domestic appliances.
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<b>List of Instruments / Equipment / Trainer Board</b>	
1	Various working Luminaries like Carbon & Metal filament lamp, Halogen lamp, Neon lamp, Fluorescent lamp, CFL, Sodium Vapour lamp, Metal Halide lamp, LED lamp
2	Different modules of heating furnace like small Resistance & Arc furnace, Induction furnace, Di-electric furnace
3	AC & DC Drives modules
4	Motor section of ceiling fan and Table fan, Universal Motor, BLDC Motor, Shaded Pole motor.
5	Demonstrative domestic equipments like Electric Iron, Emerson & Storage water heater, Toaster, Mixture-Grinder set, small Refrigerator, Air Conditioner, Flour Mill, Microwave oven, Washing Machine

<b>List of Reference Books</b>			
<b>No</b>	<b>Title of Reference Books</b>	<b>Authors</b>	<b>Publication</b>
1	Utilization of Electric Power & Electric Traction	J. B. Gupta	S. K. Kataria & Sons, New Delhi, Latest edition
2	Utilization of Electric Power & Electric Traction	G. C. Garg	Khanna Publishers, New Delhi, Latest edition
3	Art & Science of Utilization of Electrical Energy	H. Pratap	Dhanpat Rai & Sons , New Delhi, Latest edition

<b>Link of Learning Web Resource</b>	
1	<a href="http://www.nptel.iitm.ac.in">www.nptel.iitm.ac.in</a>
2	<a href="http://www.howstuffworks.com">www.howstuffworks.com</a>
3	YouTube video