# GOVERNMENT POLYTECHNIC, PURI
## DEPARTMENT OF ELECTRICAL ENGINEERING

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| Discipline: **ELECTRICAL/ CIVIL ENGINEERING** | Semester: **1ST** | Name of the Teaching Faculty: **NIHAR RANJAN DIKSHIT** |
| Subject: **BASIC ELECTRICAL ENGINEERING** | No. of days/per week class allotted: **02** | Semester From date: **25.10.2021** To Date: **31.01.2022**<br>No.of Weeks: **15** |
| **PRE-REQUISITE** | Basic knowledge about current , electricity and simple mathematics . | |
| **COURSE OUTCOMES** | **CO1**: Understand the basics of Current flow in various types of circuit<br>**CO2:** Understand the concept of Power generation.<br>**CO3**: Understand the concept of Conversion of electrical energy.<br>**CO4**: Understand the concept of Wiring and power billing .<br>**CO5:** Understand the basics of Measuring instruments . | |

| Week | Class Day | Theory/Practical Topics | DELIVERY METHOD |
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| 1ST | 1ST | **1. FUNDAMENTALS**<br>1.1 Concept of current flow.<br>1.2 Concept of source and load. | Whiteboard |
| | 2ND | 1.3 State Ohm's law and concept of resistance.<br>1.4 Relation of V, I & R in series circuit. | Whiteboard |
| 2ND | 1ST | 1.5 Relation of V, I & R in parallel circuit.<br>1.6 Division of current in parallel circuit. | Whiteboard |
| | 2ND | 1.7 Effect of power in series & parallel circuit. | Whiteboard |
| 3RD | 1ST | 1.8 Kirchhoff's Law.<br>1.9 Simple problems on Kirchhoff's law. | Whiteboard |
| | 2ND | **2. A.C. THEORY**<br>2.1 Generation of alternating emf. | Whiteboard |
| 4TH | 1ST | 2.2 Difference between D.C. & A.C. | Whiteboard |
| | 2ND | 2.3 Define Amplitude, instantaneous value, cycle, Time period, frequency, phase angle, phase difference. | Whiteboard |
| 5TH | 1ST | 2.4 State & Explain RMS value, Average value, Amplitude factor & Form factor with Simple problems. | Whiteboard |
| | 2ND | 2.5 Represent AC values in phasor diagrams. | Whiteboard |
| 6TH | 1ST | 2.6 AC through pure resistance, inductance & capacitance | Whiteboard |
| | 2ND | 2.7 AC though RL, RC, RLC series circuits. | Whiteboard |
| 7TH | 1ST | 2.8 Simple problems on RL, RC & RLC series circuits. | Whiteboard |
| | 2ND | 2.9 Concept of Power and Power factor | Whiteboard |
| 8TH | 1ST | 2.10 Impedance triangle and power triangle. | |
| | 2ND | **3. GENERATION OF ELECTRICAL POWER**<br>3.1 Give elementary idea on generation of electricity from thermal , hydro & nuclear power station with block diagram | Whiteboard |
| 9TH | 1ST | **4. CONVERSION OF ELECTRICAL ENERGY**<br>4.1 Introduction of DC machines. | Whiteboard |
| | 2ND | 4.2 Main parts of DC machines.<br>4.3 Classification of DC generator | Whiteboard |
| 10TH | 1ST | 4.4 Classification of DC motor.<br>4.5 Uses of different types of DC generators & motors. | Whiteboard |

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| | 2ND | 4.6 Types and uses of single phase induction motors. | Whiteboard |
| 11TH | 1ST | 4.7 Concept of Lumen<br>4.8 Different types of Lamps (Filament, Fluorescent, LED bulb) its Construction and Principle. | Whiteboard |
| | 2ND | 4.9 Star rating of home appliances (Terminology, Energy efficiency, Star rating Concept) | Whiteboard |
| 12TH | 1ST | **5. WIRING AND POWER BILLING**<br>5.1 Types of wiring for domestic installations.<br>5.2 Layout of household electrical wiring | Whiteboard |
| | 2ND | 5.3 List out the basic protective devices used in house hold wiring.<br>5.4 Calculate energy consumed in a small electrical installation | Whiteboard |
| 13TH | 1ST | **6. MEASURING INSTRUMENTS**<br>6.1 Introduction to measuring instruments. | Whiteboard |
| | 2ND | 6.2 Torques in instruments.<br>6.3 Different uses of PMMC type of instruments (Ammeter & Voltmeter). | Whiteboard |
| 14TH | 1ST | 6.4 Different uses of MI type of instruments (Ammeter & Voltmeter).<br>6.5 Draw the connection diagram of A.C/ D.C Ammeter, voltmeter, energy meter and wattmeter. (Single phase only). | Whiteboard |
| | 2ND | Revision | Whiteboard |
| 15TH | 1ST | Revision | Whiteboard |
| | 2ND | Revision | Whiteboard |

**BOOKS RECOMENDED:**

1. ABC of Electrical Enginnering by Jain & Jain (Dhanpat Rai Publication)
2. Fundamentals of Electrical Engg and Electronics by B.L Thereja
3. Concept of Basic Electrical Enginnering ,P.K Das and A.K. Mallick by B.M Publications
4. Fundamentals of Electrical Engg by Asfaq Hussain
5. Fundamentals of Electrical Engg by JB Gupta
6. Basic Electrical Engg. By Chakraborti (Mcgraw Hill)

**WEBSITE RESOUCES:**

01. https://www.youtube.com/watch?v=UtxZguC2OtE&list=PLm_MSClsnwm9z1WKnK0RFqLzrznI_Isb8
02. https://www.youtube.com/watch?v=qwu5DXpI7qA&list=PLWbmeZJ9qlMYpqj15QC5sziHR9WGyFLm-
03. https://youtu.be/rLUyP6g1VNI (NPTEL)

25.10.2021

Sign. of Faculty concerned

25/10/21

Sign.of HODi/c

Principal
G.Polytech