# IIPM SCHOOL OF ENGINEERIN AND TECHNOLOGY

**LESSON PLAN: 2020-21**

# Sub : BASIC ELECTRICAL ENGINEERING Semester-1ST

**Faculty name : Mausumibala panda Duration : 30 hours**

# Objective :

* To be familiar with A.C Fundamental and circuits .
* To be familiar with basic principle and application of energy conversion devices
* . To be familiar with generation of Electrical power .
* To be familiar with wiring and protective device
* . To be familiar with calculation and commercial Billing of electrical power & energy .
* To have basic knowledge of various electrical measuring instruments & conservation of electrical energy.

**Learning Outcome :**

* The basic properties of electrical elements and solve DC Circuit analysis.
* The fundamental behaviour of AC Circuits and Solve AC Circuit problems.

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| **Sl.No** | **Chapter** | **Proposed Week for Teaching** | **Lecture No.** | **Sub. Topic** | **Important Teaching Points** | **Content Source** |
| 1 |  |  | 1 |  | 1. Fundamentals 2. Concept of current flow. | ABC of Electrical Engineering by Jain & Jain |
|  |  |  |  |  | 3.Concept of source and |
|  |  |  |  |  | load. |
| 2 |  |  | 2 |  | 1. Ohm’s law and concept  of resistance. |
|  |  |  |  |  | 2.Relation of V, I & R in |
|  |  |  |  |  | series circuit. |
|  |  |  |  |  | 3.Relation of V, I & R in |
|  |  |  |  | FUNDAMENTALS | parallel circuit. |
|  | I | 1ST |  |  |
| 3 | 3 |  | 1.Division of current in  parallel circuit. |
|  |  |  |  |  | 2. Effect of power in |
|  |  |  |  |  | series & parallel circuit. |
|  |  |  |  |  | 3.Numericals |
| 4 |  |  | 4 |  | 1.Kirchhoff’s Laws  -Kirchhoff’s Current law. |
|  |  |  |  |  | -Kirchhoff’s Voltage |
|  |  |  |  |  | Law. |
|  |  |  |  |  | 2.Numericals |
| 5 | II | 2ND | 1 |  | 1. Generation of alternating emf. 2.Difference between  D.C. & A.C. |  |

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| 6 |  |  | 2 |  | 1.Definition- Amplitude,  instantaneous value, |  |
|  |  |  | cycle, Time period, |  |
|  |  |  | frequency, phase angle, |  |
|  |  |  | phase difference. |  |
| 7 | 3 |  | 1.RMS value, Average  value, Amplitude factor & |  |
|  |  |  | Form factor. |  |
| 8 | 4 |  | 1. Represent AC values in phasor diagrams. 2. AC through pure resistance, inductance &   capacitance. | ABC of |
|  |  |  | Electrical |
|  |  |  | Engineering |
|  |  | A.C. THEORY | by Jain & Jain |
| 9 | 3rd | 1 | 1. Concept of Power and  Power factor. |
|  |  | 2 |  | 2.Impedance triangle and |  |
|  |  |  |  | power triangle |  |
|  |  | 3 |  |  |  |
| 10 |  |  |  | 1.Numericals |  |
|  |  | 4 |  |  |  |
| 11 |  |  |  | Assignment |  |
| 12 | III | 4th | 1 |  | 1.Introduction 2.Block diagram of | ABC of Electrical Engineering by Jain & Jain |
|  |  |  |  |  | Thermal power station |
|  |  |  |  |  | Advantages,Disadvanages |
| 13 |  |  | 2 |  | 1.Hydroelectric Power |
| GENERATION OF ELECTRICAL | station.  Advantages,Disadvanages |
|  |  |  |  | POWER |  |
| 14 | 3 | 1.Nuclear power station. Advantages,Disadvanages |
| 15 |  |  | 4 |  | Assignment |
| 16 | IV | 5th | 1 |  | 1.Introduction of DC  machines. |  |
|  |  |  |  |  | 2.Main parts of DC |  |
|  |  |  |  |  | machines. |  |
| 17 |  |  | 2 |  | 1Principle of operation of  DC generator. |  |
|  |  |  |  |  | 2. EMF equation of DC |  |
|  |  |  |  |  | generator. |  |
|  |  |  |  | CONVERSION OF ELECTRICAL ENERGY |  | ABC of Electrical Engineering by Jain & |
| 18 | 3 | 1.Classification of DC generator.  3.Numericals |
|  |  |  |  |  |  | Jain |
| 19 |  |  | 4 |  | 1. Uses of different types of DC generators & motors. 2. Types and uses of single phase induction motors. 3. Types and uses of   3-phase inductionmotors. |  |

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| 20 |  | 6th | 1 |  | 1.Principle of operation of  DC motor. |  |
|  |  |  | 2. Classification of DC |
|  |  |  | motor. |
| 21 | V |  | 2 |  | 1. Wiring-Introduction 2. Types of wiring for |  |
|  |  |  |  |  | domestic installations. |  |
| 22 |  |  | 3 |  | 1.Layout of household  electrical wiring (single |  |
|  |  |  |  |  | line diagram showing all |  |
|  |  |  |  | WIRING AND POWER BILLING | the important component in the system). | ABC of Electrical Engineering by Jain & Jain |
| 23 | 4 | 1. The basic protective devices used in house hold wiring. 2. Calculate energy |
|  |  |  |  |  | consumed in a small |  |
|  |  |  |  |  | electrical installation |  |
| 24 |  | 7th | 1 |  | Numericals |  |
| 25 | VI |  | 2 |  | 1.Different uses of  PMMC type of |  |
|  |  |  |  |  | instruments (Ammeter & |  |
|  |  |  |  |  | Voltmeter). |  |
|  |  |  |  |  | 2. Different uses of MI |  |
|  |  |  |  | MEASURING INSTRUMENTS | type of instruments  (Ammeter & Voltmeter) | ABC of Electrical Engineering by Jain & Jain |
| 26 | 3 | 1.connection diagram of A.C/ D.C Ammeter, voltmeter, energy meter  and wattmeter. (Single |
|  |  |  |  |  | phase ). |  |
| 27 |  |  | 4 |  | Assignment |  |
| 28 | VII | 8th | 1 |  | 1. Introduction 2. Concept of Lumen |  |
| 29 |  |  | 2 |  | 1.Different types of |  |
|  |  |  |  |  | Lamps |  |
|  |  |  |  |  | 2.Filament, fluorescent |  |
|  |  |  |  |  | lamp |  |
|  |  |  |  | CONSERVATION OF ELECTRICAL ENERGY | 3. Mercury Vapour lamp(  Construction and Principle) | ABC of Electrical Engineering by Jain &  Jain |
| 30 | 3 | 1.Sodium Vapour lamp 2.Neon, LED bulb  Construction and |
|  |  |  |  |  | Principle |  |
| 31 |  |  | 4 |  | 1.Star rating of home  appliances (Terminology, |  |
|  |  |  |  |  | Energy efficiency, Star |  |
|  |  |  |  |  | rating Concept) |  |
| 32 |  |  | 1 |  | Assignment |  |