**LESSON PLAN**

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| **Discipline:**  Elect. Engg. | **Semester:**  Fourth(4th) | **Name of the Faculty:** Er R Kar & Er A K Patra |
| **Subject:**  Electrical Measurement & Instrumentation  ( Th-3) | **No. of days per Week class allotted:**  **S**ix (6) | **Semester from Date:16.01.24**  **to Date: 26.04.24**  **No. of Weeks:** 15 |
| **WEEK** | **CLASS DAY** | **THEORY TOPICS** |
| 1st | 1st | **Ch-01: (Measuring Instruments):**  Introduction to Measurement, Instrument, Standard |
| 2nd | Define Accuracy, precision, Errors, Resolutions Sensitivity &Tolerance |
| 3rd | Classification of measuring instruments. |
| 4th | Explain Deflecting torque of an instrument-controlling and damping arrangements in indicating type of instrument |
| 5th | Calibration of instruments |
| 6th | **Possible question answer discussion** |
| 2nd | 1st | **Ch-02: (Analog ammeters & Volt meters):**  Describe construction, principle of operation, errors, ranges merits and demerits of Moving iron type instruments |
| 2nd | Moving iron type instruments-construction, principle of operation |
| 3rd | Errors& ranges, Merits & demerits |
| 4th | Permanent Magnet Moving coil type instruments. -construction & principle of operation |
| 5th | Error, range & merits & demerits |
| 6th | Dynamometer type instruments-construction principle of operation-errors, ranges, merits & demerits |
| 3rd | 1st | Errors, ranges, merits & demerits |
| 2nd | Rectifier type instruments |
| 3rd | Induction type instruments |
| 4th | Extend the range of instruments by use of shunts and Multipliers. |
| 5th | Solve numerical |
| 6th | **Possible question answer discussion** |
| 4th | 1st | **Ch-03: (Wattmeters & Measurement of Power):**  Describe Construction of dynamometer type wattmeter |
| 2nd | principle of working Dynamometer type  wattmeter |
| 3rd | **Monthly test-01** |
| 4th | Discuss L P F Electro – Dynamometer type wattmeter |
|  | 5th | Discuss U P F Electro – Dynamometer type wattmeter |
| 6th | The Errors in Dynamometer type wattmeter and methods of their correction |
| 5th | 1st | Discuss Induction type wattmeters |
| 2nd | **Possible question answer discussion** |
| 3rd | **Ch-04: (Energy meters & Measurement of energy):**  Introduction -Single Phase induction type energy meter- |
| 4th | Construction. working Principle & their |
| 5th | -Compensation and adjustments |
| 6th | - Compensation and adjustments. |
| 6th | 1st | Testing of energy Meters |
| 2nd | **Possible question answer discussion** |
| 3rd | **Ch-05: (Measurement of Speed, Frequency,& Power Factor):**  Tachometers, types |
| 4th | Tachometer working principles |
| 5th | Principle of operation and construction of Mechanical resonance type frequency meter |
| 6th | Cont… |
| 7th | 1st | - Electrical resonance Type frequency meters. |
| 2nd | Principle of operation and working of Dynamometer type single phase power factor meter |
| 3rd | Three phase power factor meters |
| 4th | **Possible question answer discussion** |
| 5th | **Monthly test-02** |
| 6th | **Ch-06: (Measurement of Resistance,Inductance & Capacitance):**  Classification of resistance |
| 8th | 1st | Measurement of low resistance by potentiometer method |
| 2nd | Measurement of medium resistance by wheat Stone bridge method |
| 3rd | Measurement of high resistance by loss of charge method. |
| 4th | construction & principle of operations Megger and Earth tester for insulation resistance and Earth resistance measurement respectively |
| 5th | Explain construction and principles of Multimeter (Analog and Digital). |
| 6th | Measurement of Inductance by Maxwell’s Bridge method |
| 9th | 1st | Measurement of capacitance by Schering Bridge method |
| 2nd | **Possible question answer discussion** |
| 3rd | **Ch-07: (Sensor & Transducer):**  Define transducer, sensing element or detector element and transduction elements |
| 4th | Classify transducer. give examples of various class of transducer |
| 5th | **Monthly test-03** |
| 6th | Resistive transducer |
| 10th | 1st | Linear and angular motion Potentiometer.  Thermistor and Resistance Thermometer |
| 2nd | Wire resistance strain gauges |
| 3rd | Inductive transducer, Principle of linear variable differential transformer (LVDT), Uses LVDT |
| 4th | Capacitive transducer),  General principle of capacitive transducer  Variable area capacitive transducer |
| 5th | Change in distance between plate capacitive transducer |
| 6th | Piezo electric transducer and its application and Hall effect transducer with their application |
| 11th | 1st | **Possible question answer discussion** |
| 2nd | **Ch-08: (Osciloscope):**  Principle of operation of cathode ray tube |
| 3rd | Principle of operation of oscilloscope (with help of  block diagram) |
| 4th | Cont. |
| 5th | **Monthly test-04** |
| 6th | Measurement of DC voltage & current |
| 12th | 1st | Measurement of AC voltage, current, phase& frequency |
| 2nd | Cont. |
| 3rd | **Possible question answer discussion** |
| 4th | Revision |
| 5th | Revision |
| 6th | Revision |
| 13th | 1st | Revision |
| 2nd | Revision |
| 3rd | Revision |
| 4th | Revision |
| 5th | Revision |
| 6th | Revision |
| 14th | 1st | Revision |
| 2nd | Revision |
| 3rd | Revision |
| 4th | Revision |
| 5th | Revision |
| 6th | Revision |
| 15th | 1st | Revision |
| 2nd | Revision |
| 3rd | Revision |
| 4th | Revision |
| 5th | Revision |
| 6th | Revision |

**Syllabus Coverage up to Inter assessment – Chapter-01 , 02,03,& 04.**