**Lesson Plan**

**Name of faculty: SUNIL KUMAR DAHIYA, AP-ECE**

**Discipline: ECE**

**Semester: 4TH**

**Subject: ELECTRONICS MEASUREMENTS & INSTRUMENTS**

Lesson Plan Duration: 15 weeks (from January, 2018 to April, 2018)

Work Load(Lecture/Practical) per week (in hours): Lectures: 03 hours, Practicals-06 hours, Tutorials:02hours

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Week** | **Theory** | | **Practical** | |
|  | **Lecture day** | **Topic(Including assignment/ test)** | **Practical day** | **Topic** |
| 1st |  | Functional elements and generalized configuration of a measuring Instrument, | 1 | To measure the unknown Inductance in terms of capacitance and resistance by using Maxwell’s Inductance bridge. |
|  | Characteristics of instruments |
|  | errors in measurements and their statistical |
| 2nd |  | Wheat stone bridge, | 2 | To measure unknown Inductance using Hay’s bridge |
|  | Carey-Foster Bridge, Kelvin double bridge |
|  | Measurement of Insulation resistance |
| 3rd |  | Maxwell Inductance bridge. Maxwell Inductance Capacitance | 3 | To measure unknown capacitance of small capacitors by using Schering’s bridge |
|  | Bridge, Anderson’s Bridge, Hay’s Bridge, De- Sauty’s Bridge |
|  | Schering’s bridge and Wein’s bridge |
| 4th |  | Analog voltmeters and Potentiometers, | 4 | To measure 3-phase power with 2-Wattmeter method for balanced and unbalanced bridge |
|  | Self-balancing potentiometer and X-Y recorders, |
|  | Galvanometers -Oscillographs |
| 5th |  | Cathode -Ray Oscilloscopes | 5 | To measure unknown frequency using Wein’s frequency bridge |
|  | Magnetic Tape Recorders. |
|  | Wave analyzer, |
| 6th |  | Distortion meter: Q-meter. | 6 | To measure unknown capacitance using De-Sauty’s bridge |
|  | Measurement of Op-Amp parameters. |
|  | Digital Indicating Instruments, |
| 7th |  | Comparison with analog type | 7 | To measure unknown low resistance by Kelvin’s Double bridge |
|  | Digital display methods |
|  | Digital methods of time and frequency measurements |
| 8th |  | Digital voltmeters | 8 | To test the soil resistance using Meggar (Ohm meter). |
|  | Classification of Transducers |
|  | Strain Gauge |
| 9th |  | Displacement Transducers | 9 | To calibrate Energy meter using standard Energy meter |
|  | Capacitive Transducers |
|  | LVDT |
| 10th |  | Piezo-electric Transducers | 10 | To plot the B-H curve of different magnetic materials. |
|  | Temperature Transducers – resistance thermometer, |
|  | Thermocouples |
| 11th |  | Thermistors | 11 | To calibrate the Voltmeter using Crompton Potentiometer |
|  | Liquid level measurement |
|  | Low pressure(vacuum) measurement |
| 12th |  | A to D CONVERTERS | 12 | To convert the Voltmeter into Ammeter using Potentiometer. |
|  | D to A converters |
|  | Analog and Digital Data Acquisition Systems |
| 13th |  | Analog and Digital Data Acquisition Systems | 13 | Insulation testing of cables using Digital Insulation Tester |
|  | Analog and Digital Data Acquisition Systems |
|  | Multiplexing |
| 14th |  | Multiplexing |  | Viva-voice |
|  | Multiplexing |
|  | Telemetry |
| 15th |  | Telemetry |  | Viva-voice |
|  | Spatial Encoders |
|  | Spatial Encoders |