|  |  |  |
| --- | --- | --- |
| Discipline :-**ELECTRICAL** | Semester:- **4**th | Name of the Teaching Faculty:-**New-1** |
| Subject:- **INSTRUMENTATION & CONTROL** | No of Days/per Week Class Allotted :-**04** | Semester From:- **2nd Jan, 2019** To:- **15th April, 2019**No of Weeks:- **15** |
| **Week** | **Class Day** | **Theory**  |
|    1st | 1st | **SENSORS AND TRANSDUCER** |
| 2nd | Define Transducer, sensing element or detector element and transduction elements. |
| 3rd | Classify transducer. Give examples of various class of transducer |
| 4th | Resistive transducer i) Potentiometer |
|  2nd | 1st | Strain gauges- a) Derive gauge factor, b) Explain constructional features of Bonded and unbonded strain gauge. |
| 2nd | Platinum Resistance thermo meter |
| 3rd |  Constructional feature and resistance temperature characteristic of thermistors |
| 4th | Explain principle of linear variable differential Transformer (LVDT) |
|   3rd | 1st |  State uses LVDT |
| 2nd | Explain general principle of capacitive transducer |
| 3rd | Explain variable area capacitive transducer |
| 4th |  Explain change in distance between plate capacitive transducer |
|  4th | 1st | Advantage and disadvantages of capacitive transducer. |
| 2nd | Piezo electric Transducer and its applied |
| 3rd | Principle of opto-electronic Transducer and its application |
| 4th | OSCILLOSCOPE |
|  5th | 1st | Principle of operation of Cathode Ray Tube |
| 2nd | Principle of operation of Oscilloscope (with help of block diagram). |
| 3rd | Measurement of DC Voltage & current. |
| 4th | Measurement of AC Voltage, current, phase & frequency |
|  6th | 1st | MEASUREMENT OF NON ELECTRIC QUALITIES. |
| 2nd | Principle of measurement of stress and strain by help of deflection type wheatstone bridge. |
| 3rd |  Principle of measurement of pressure |
| 4th | Measurement of low pressure by – Pirari gauge. |
|  7th | 1st | Measurement of normal pressure by inductive and capacitive transducer |
| 2nd | Principle of measurement of temperature. |
| 3rd | Measurement of temperature by platinum resistance thermometer. |
| 4th | Measurement of temperature by thermo couple. |
|  8th | 1st | Measurement of High temperature high optical pyrometer |
| 2nd | Measurement of flow by turbine meter |
| 3rd | Measurement of liquid level by resistive transducer |
| 4th | **CONTROL SYSTEM** |
| 9th | 1st | Introduction |
| 2nd | Classification of control system. |
| 3rd | Open loop control system, Closed loop control system |
| 4th | Comparison of open loop vs. closed loop control system |
|  10th | 1st |  What is feedback and what are its effects. |
| 2nd | **INTRODUCTION.TO SERVOMECHANISM** |
| 3rd | Automatic Tank level control system |
| 4th | Position control system |
|  11th | 1st | D. C. closed loop servo control system |
| 2nd | A.C closed loop servo control system |
| 3rd | Mathematical modeling of physical system |
| 4th |  Mathematical modeling of translational mechanical system |
|  12th | 1st |  Mathematical modeling of rotational mechanical system |
| 2nd | Mathematical modeling of electrical system. |
| 3rd | Analogous between mechanical and electrical system |
| 4th | Transfer function |
|  13th | 1st | Transfer function of single input-single output (SISO) system |
| 2nd | Characteristic Equation. |
| 3rd | Procedure for deriving transfer function. |
| 4th | **SERVOMOTORS:- D. C servomotors. A. C. servomotors.** |
|  14th | 1st | Synchro transmitter and receiver and Synchro as an error detector. |
| 2nd | **BLOCK DIAGRAM OF CONTROL SYSTEM** |
| 3rd | Block diagram of a closed loop system and Derive transfer function |
| 4th | Procedure for drawing block diagram. |
|  15th | 1st | **STABILITY OF CONTROL SYSTEM** |
| 2nd | Definition of stability of control system. |
| 3rd | Necessary conditions for stability & Routh stability criterion |
| 4th | Application of Routh stability criterion to liner feedback system |