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| **Name of Faculty** | | | Sh. Pardeep Kumar | | |
| **Discipline** | | | Electrical Engineering | | |
| **Semester** | | | 5th | | |
| **Subject** | | | Instrumentation | | |
| **Duration** | | | (From September 2022 to January 2023) Theory : 04, Practical : 02 | | |
| **Week** | | **Theory** | | **Practical** | |
|  | **Lecture**  **Day** | **Topic (Including Assignment/ Test)** | | **Practical**  **Day** | **Topic** |
| 1st | Day 1 | **1.Measurements** | | Day 1 | To measure the level of a liquid using a transducer |
| Day 2 | Importance of measurement, Basic  measuring systems | |
| Day 3 | Advantages and limitations of each  measuring systems | |
| Day 4 | Generalized measurement system, signal  conditioning | |
| 2nd | Day 1 | Display devices | | Day 1 | To measure temperature using a thermo-couple |
| Day 2 | Revision | |
| Day 3 | **2.Transducers** | |
| Day 4 | Theory, construction and use of various  transducers | |
| 3rd | Day 1 | Resistance | | Day 1 | Practice /Checking |
| Day 2 | Inductance | |
| Day 3 | Capacitance | |
| Day 4 | Electromagnetic | |
| 4th | Day 1 | piezo electric type | | Day 1 | Study and use of digital temperature controller |
| Day 2 | Revision | |
| Day 3 | **3.Measurement of Displacement and**  **Strain** | |
| Day 4 | Displacement Measuring Devices: | |
| 5th | Day 1 | wire wound potentiometer | | Day 1 | Use of themistor in ON/OFF transducer |
| Day 2 | LVDT, strain gauges | |
| Day 3 | and their different types such as inductance  type, | |
| Day 4 | resistive type | |
| 6th | Day 1 | Wire and foil type etc. | | Day 1 | Practice /Checking |
| Day 2 | Gauge factor, gauge materials | |
| Day 3 | And their selections, sources of errors  and its compensations. | |
| Day 4 | Use of electrical strain gauges | |
| 7th | Day 1 | Strain gauge bridges and amplifiers. | | Day 1 | Study of variable capacitive transducer |
| Day 2 | Revision | |
| Day 3 | **4.Force and Torque Measurement:** | |
| Day 4 | Different types of force measuring devices  and their principles, | |
| 8th | Day 1 | Load measurements by using elastic  Transducers | | Day 1 | Draw the characteristics of a potentiometer |
| Day 2 | and electrical strain gauges | |
| Day 3 | Load cells | |
| Day 4 | Proving rings | |
| 9th | Day 1 | Measurements of torque by brake | | Day 1 | Practice /Checking |
| Day 2 | Dynamometer | |

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|  | Day 3 | Electrical strain gauges, |  |  |
| Day 4 | Speed measurements; |
| 10th | Day 1 | different methods, devices | Day 1 | To measure linear displacement using LVDT |
| Day 2 | Revision |
| Day 3 | **5.Pressure Measurement** |
| Day 4 | Bourdon pressure gauges |
| 11th | Day 1 | Electrical pressure pickups and their  principle, | Day 1 | To study the use of electrical strain gauge |
| Day 2 | Construction and applications |
| Day 3 | Use of pressure cells. |
| Day 4 | Revision |
| 12th | Day 1 | **6.Flow Measurement:** |
| Day 2 | Basic principles of magnetic | Day 1 | Practice /Checking |
| Day 3 | Ultrasonic flow meters |
| Day 4 | Revision |
| 13th | Day 1 | **7.Measurement of Temperature:** | Day 1 | To study weighing machine using load cell |
| Day 2 | Bimetallic thermometer |
| Day 3 | Pressure thermometers |
| Day 4 | Thermoelectric thermometers,  resistance thermometers, |
| 14th | Day 1 | Thermocouple, | Day 1 | To study pH meter |
| Day 2 | Thermisters |
| Day 3 | Pyrometer, errors in temperature  measurements in rapidly moving fluids |
| Day 4 | Temperature recorders |
| 15th | Day 1 | Revision | Day 1 | Practice /Checking |
| Day 2 | **8. Measurement of other non- electrical quantities** |
| Day 3 | such as humidity |
| Day 4 | pH level and |
| 16th | Day 1 | Vibrations | Day 1 | Internal practical |
| Day 2 | Revision of Hsbte old Paper |
| Day 3 | Revision of Hsbte old Paper |
| Day 4 | Revision of Hsbte old Paper |