

# GUJARAT TECHNOLOGICAL UNIVERSITY

## Diploma in Instrumentation and Control Engineering

Semester: 3

**Subject Code**

**Subject Name** TRANSDUCERS AND TELEMETRY

Sr. No.	Course content
1.	<b>INTRODUCTION OF TRANSDUCERS :</b> 1.1 Definition of Transducers. 1.2 Classification of Transducers. 1.3 Basic Requirements and Characteristics of Transducers.
2.	<b>ACTIVE AND PASSIVE TRANSDUCERS :</b> Working principle, Characteristics, Construction, Advantages, Limitations and Applications of the following Transducers:- 2.1 Resistive Transducers. 2.2 Inductive Transducers (self & mutual induction) (LVDT, RVDT). 2.3 Capacitive Transducers. 2.4 Thermoelectric Transducers (Thermocouple, RTD & Thermistor). 2.5 Piezo – electric Transducers. 2.6 Magnetostriction Transducers. 2.7 Radioactive Transducers. 2.8 Strain gauge Transducers. 2.9 Ultrasonic Transducers. 2.10 Photo electric Transducer (Photodiode & Photo transistor). 2.11 Optical Transducers. 2.12 Digital Encoders and Encoder Transducers. 2.13 Semiconductor Pressure Sensor. 2.14 Application of Hall effect transducers.
3.	<b>TELEMETERING :</b> 3.1 Methods of Data Transmission. 3.2 Telemetry and General Telemetering System. 3.3 PNEUMATIC TELEMETRY 3.3.1 Introduction and principle of flapper nozzle system. 3.3.2 Force balance transmitter. 3.3.3 Merits, Demerits and application of pneumatic telemetering. 3.4 ELECTRICAL TELEMETRY 3.4.1 Voltage Telemetering Systems, Current Telemetering Systems, Position Telemetering Systems 3.4.2 Telemetry by using Wheatstone Bridge, Selsyn, induction and ratio principle. 3.5 ELECTRONIC TELEMETRY 3.5.1 Modulation - Frequency modulation, Amplitude modulation and Phase Modulation

	3.5.2 Pulse Telemetry System – Analog Pulse Telemetry (Pulse Amplitude Modulation System, Pulse Frequency, Pulse Duration Modulation, Pulse Position Modulation) and Digital Telemetry (Pulse Code Modulation)
<b>4.</b>	<b>MISCELLANEOUS</b> 4.1 Fiber optics – optical fiber and fiberscope -Working principle and application. 4.2 Intrinsic safety and Safety barriers. 4.3 Comparative study of Pneumatic V/S Electronic telemetry 4.4 Annunciator : Block diagram , Working and applications 4.5 I to V and V to I converters : Block diagram, working principle and application with example.

### **Reference Books:**

1. A Course in Electrical and Electronic Measurements and Instrumentation – A. K. Sawhney (Dhanpat Rai & Sons)
2. Instrumentation Devices and Systems – Rangan, Sarma , Mani (Tata McGraw Hill)
3. Mechanical and Industrial measurements -R. K. Jain (Khanna Publishes)
4. Transducers and Instrumentation – D V S Murty (Prentice Hall of India)