



COURSE TITLE

TEMPERATURE MEASUREMENT IN PROCESS INDUSTRIES



BUILDING COMPETENCE, INSPIRING CONFIDENCE

Course Objectives

- Understand the fundamentals of temperature and heat transfer mechanisms
- Identify and compare different temperature measurement principles and instruments
- Select appropriate temperature sensors for various process applications
- Understand installation considerations, limitations, and common errors
- Apply best practices for thermowell and non-contact temperature measurement
- Improve reliability, accuracy, and safety of temperature measurement in process plants

Target Audience

- Instrumentation & Control Engineers, Maintenance Engineers and Technicians
- Process Engineers, Plant Operators and Supervisors
- Reliability & Inspection Personnel



Course Content

Fundamentals of Temperature

- Concept of Hotness and Coldness of a Substance
- Temperature Units and Scales
 - Celsius ($^{\circ}\text{C}$)
 - Fahrenheit ($^{\circ}\text{F}$)
 - Absolute Temperature
- Heat Transfer Mechanisms
 - Conduction
 - Convection
 - Radiation

Basic Types of Thermometers

- Bimetallic Thermometers
- Liquid-in-Glass Thermometers
- Filled System Thermometers



Course Content

Electrical Temperature Measuring Instruments

- Overview of Electrical Temperature Sensors
- Resistance Temperature Detectors (RTDs)
 - RTD Principles
 - Common RTD Types
 - 2-Wire, 3-Wire, and 4-Wire RTD Wiring (with diagrams)
- Thermistors
 - Operating Principle
 - Types of Thermistors
- Thermocouples
 - Working Principle
 - Common Thermocouple Types and Applications
- Triple Point of Water
- Thermopiles



Course Content

Thermowells

- What Is a Thermowell?
- Why Do We Use a Thermowell?
- Thermowell Specifications
- Types of Thermowells
- Key Considerations Before Thermowell Selection
- Choosing the Right Type of Thermowell
- Wake Frequency and Flow-Induced Vibration

Non-Contact Temperature Measurement

- Electromagnetic Radiation and Temperature Measurement
- Pyrometry
 - Types of Pyrometers
 - Narrow Band (Optical Pyrometers)
 - Broad Band (Radiation Pyrometers)
- Effect of Emissivity on Measurement Accuracy

Instructor



Mr. Aftab Ahmed Mazari **Instrumentation Expert**

Mr. Aftab Ahmed Mazari has over 43 years of extensive practical experience as an Instrument Engineer. He completed his science graduation from Punjab University and received industrial instrumentation training from Russia.

He began his professional career at Pakistan Steel, where he served for 10 years. He later joined Fauji Fertilizer Company (FFC) and retired after completing 30 years of service with rich and diverse experience. Following his retirement, he worked as an Instrument and Consultant Engineer with SABIC in Saudi Arabia for one year.

Mr. Aftab Ahmed Mazari possesses wide expertise in instrumentation consultancy, Reliability Centered Maintenance (RCM), reliability engineering, and professional training. He has delivered training programs and courses to both local and international clients, including SABIC in Saudi Arabia and multinational companies such as ENI, Lotte, BHP, Engro, and HUBCO.

He has developed several training aids for instrument engineers and technicians, including simulators and training rigs such as vibration simulators, vibration switch testing rigs, speed simulators, compound gear simulators, and SOV training rigs. In addition, he has designed and produced cutaway models of control valves, pressure safety valves (PSV), rotameters, temperature sensors, pressure regulators, volume boosters, and trip relays.

Mr. Aftab Ahmed Mazari has also authored eight industrial instrumentation books for instrument and operations personnel, which are widely referred to in various industrial facilities across Pakistan.

Logistics

Duration

1 day

Location

Client site or Lahore

Training Instructors

Mr. Aftab Ahmed Mazari

Get in Touch

 **+92 345 3882040 | +92 300 8670542**

 **info@ftc-consultancy.com**



Fateh
Trainings & Consultancy