



# CHEMICAL PROCESS INSTRUMENTATION

## **PROF. DEBASIS SARKAR**

Department of Chemical Engineering  
IIT Kharagpur

**INTENDED AUDIENCE :** Chemical Engineering, Chemical Technology, Instrumentation Engineering

**INDUSTRY SUPPORT:** This course may be of general interest to many chemical process industries such as: Indian Oil Corporation Ltd., Tata Chemicals, etc., Haldia Petrochemicals Ltd., Hindustan Petroleum

## **COURSE OUTLINE :**

This course covers the key aspects of chemical process instrumentation. The course will provide a comprehensive introduction to principles and practices of measurement of important chemical process variables such as temperature, pressure, flow, level, concentration, etc. This is primarily intended for the undergraduate students from chemical, instrumentation, and allied engineering disciplines.

## **ABOUT INSTRUCTOR :**

Debasis Sarkar is currently an Associate Professor at Chemical Engineering Department of Indian Institute of Technology Kharagpur. He received his BTech from Calcutta University, Master of Engineering from Indian Institute of Science, Bangalore, and PhD from Indian Institute of Science, Bangalore, all in Chemical Engineering. He was a Postdoctoral Fellow at University of Western Ontario, Canada. Prior to joining IIT Kharagpur, he worked with ICES Singapore and HBTI Kanpur. His current research interests are in applications of process systems engineering approaches for crystallization engineering and biosystems engineering. His teaching interests include, among others, optimization techniques, instrumentation and process control, advanced heat transfer.

## **COURSE PLAN :**

**Week 1:** General principles and representation of instruments

**Week 2:** Performance characteristics of instruments and data analysis: 1 Theorem

**Week 3:** Performance characteristics of instruments and data analysis: 2

**Week 4:** Transducer elements

**Week 5:** Pressure measurement: Moderate and high pressure measuring instruments

**Week 6:** Pressure measurement: High vacuum measuring instruments

**Week 7:** Temperature measuring instruments: 1

**Week 8:** Temperature measuring instruments: 2

**Week 9:** Flow measurement

**Week 10:** Level measurement

**Week 11:** Measurement of concentration, density, viscosity, and pH

**Week 12:** Control valve, Piping and instrumentation diagram