ANALYTICAL INSTRUMENT SYSTEM

TRAINIT ACADEMY

ICE102
Instrumentations
& Control
Engineering

COURSE TITLE

ANALYTICAL INSTRUMENT SYSTEM

COURSE DATE/ VENUE

19 – 23 September 2021

Dubai, UAE

COURSE REFERENCE

ICE102

COURSE DURATION

05 Days

DISCIPLINE

Instrumentations & Control Engineering

COURSE INTRODUCTION

Instrumental methods of analysis became the methods of choice in modern laboratories. Sensitivity, selectivity, multi-analyte analysis and processing large number of samples in short time contribute to this progress. Instrumental methods are usually associated with employment of small amounts of samples and minimum use of toxic reagents. This course deals with the principles and applications of modern analytical instruments. Emphasis is placed upon the theoretical basis of each type of instrument, its optimal area of application, its sensitivity, its precision, and its limitations. Electroanalytical, spectroscopic and chromatographic methods will be covered in detail. Statistical treatment of analytical data and validation of analytical method will be emphasized.

COURSE OBJECTIVE

Upon successful completion of this course, the delegates will be able to:

✓ Discuss about the philosophy behind instrumental methods.

- ✓ Explain the principles of popular instrumental methods.
- ✓ Use statistical methods and validation of analytical results.
- ✓ Identify the complementary aspects of various instrumental methods.
- ✓ Perform handling of real samples related to industrial, environmental and biomedical analysis.
- ✓ Perform purchase of an instrument of analysis or how to get the best of it.

COURSE AUDIENCE

All scientists and engineers involved in chemical analysis and working in analytical laboratories.

COURSE CONTENT

Introduction to Instrumental Methods

- Philosophy behind instrumental methods
- Survey of instrumental methods
- The analytical process

Statistical Evaluation of Analytical Data and Validation of Analytical Method

- Accuracy, precision, confidence intervals
- Validation of analytical results
- Linearity and least squares method
- Internal standard and standard addition methods
- Validation of analytical methods
- Development of standard operation procedures (SOPs)

Electroanalytical Methods

- Introduction to electrochemical methods
- Potentiometric methods
- Voltammetric methods

Spectroscopic Methods

- Introduction to spectroscopic methods

- Ultraviolet and Visible Absorption Spectroscopy
- Molecular Fluorescence and Phosphorescence
- Atomic Absorption Spectroscopy
- Atomic Emission Spectroscopy
- Mass Spectrometry

Chromatographic Separations
- Fractionation processes
- Operational aspects of chromatographic separations
- Gas Chromatography
- High Performance Liquid Chromatography

Sample Preparation for Instrumental Analysis
- Sample preparation for elemental analysis
- Sample preparation for analysis by gas chromatography
- Sample preparation for analysis by liquid chromatography

COURSE CERTIFICATE

TRAINIT ACADEMY will award an internationally recognized certificate(s) for each delegate on completion of training.

COURSE FEES

$4,150 per Delegate. This rate includes participant's manual, Hand-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

COURSE METHODOLOGY

The training course will be highly participatory and the course leader will present, guide and facilitate learning, using a range of methods including formal presentation, discussions, sector-specific case studies and exercises. Above all, the course leader will make extensive use of real-life case examples in which he has been personally involved. You will also be encouraged to raise your own questions and to share in the development

of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Case studies & Practical Exercises
- 10% Role Play
- 10% Videos, Software or Simulators (as applicable) & General Discussions

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