



Problem solving in Chemical Analysis

Introduction:

The good and advance chemical laboratory can motivate to accomplish high quality work. It is very important for lab staff to learn how to create the success in their laboratory. This course is designed to provide a practical application of chemical analysis in the laboratory. It is designed also to understand concepts of basic chemical analysis in laboratory, how to develop technical, and methods in lab and how to evaluate the lab results.

Who Should Attend?

The course is of interest for Specialist, Shift Specialist, Senior Specialist, Shift Supervisor, Chemist, Shift Chemist

Methodology:

This interactive Training will be highly interactive, with opportunities to advance your opinions and ideas and will include;

- Lectures
- Workshop & Work Presentation

- Case Studies and Practical Exercise
- Videos and General Discussions

Certificate:

BTS attendance certificate will be issued to all attendees completing minimum of 80% of the total course duration

Course Objectives:

Upon the successful completion of this course, the participants will have an understanding of Principles and practices of the modern instruments technique with different methods of calibration, standardization, and blank correction for analytical instruments.

Course Outline:

- Introduction
- Chemistry Historical and review
- Sampling & Sample preparation
 - ❖ Sampling system criteria (At line; On line; In line; Off line)
 - ❖ Sampling plan and procedures (Grab, Composite, Integrated)
 - ❖ Inspect and Report special samples to the QA
 - ❖ SOPs for sampling & sample preparation
 - ❖ Control Samples & Reference Samples
 - ❖ Sample Equipment and Containers
 - ❖ Sample Labels and information form for LIMS
 - ❖ Types of Sampling (Solid, Liquid, Water, Chemicals, and Oil Sampling)
 - ❖ Sample Handling and Preparation
- Analytical Chemistry and Chemical Analysis
- Instrumental analysis in laboratory
- Spectroscopic Instrumental Analysis
 - ❖ Molecular Spectroscopy analysis
 - ❖ Atomic Spectroscopy analysis
- Separation Instrument Analysis

- Electrochemical Instrument analysis
- Comparing Instrumental Techniques
- Choosing the Right Instrument
- Chemical laboratory measurement evolution
 - ❖ Reporting results
 - ❖ Significant Figure Rules
 - ❖ Laboratory Certification
 - ❖ The Evaluation of Results and Methods
- Instrumentals Calibration, and Standardization
 - ❖ History of Calibration Requirements
 - ❖ Instruments Calibration and Traceability
 - ❖ Standard Reference Materials
 - ❖ Correction of errors and improving blank
 - ❖ Calibration work instructions
 - ❖ Calibration Procedures, Certificate, and Documentation
 - ❖ Methodologies for a Calibration Program
 - Standard calibration
 - Internal Standard calibration
 - External Standard calibration
- Calibration Reports: Requirements
- Calibration Records
- Safety Considerations
- Precision Equipment Handling/Storage
- Maintenance and troubleshooting in instrumental analysis
 - ❖ Routine Maintenance
 - ❖ Preventive Maintenance
 - ❖ Troubleshooting
 - ❖ Corrective and Preventive Action
- Quality / Calibration Manual
- Measurement Uncertainty in testing and calibration
- Instrumentals validation
- Repeatability and Reproducibility
- Detection limit
- Inter-Laboratory Comparison (ILC)
- Practical exercises for Inter-Laboratory Proficiency Testing