

Laboratory Instruments Calibrations and Troubleshooting Techniques

Course general description:

This training course focus on laboratory instruments calibration and troubleshooting techniques trough support personnel employed in laboratories by giving a better understanding of the technical requirements regarding installation, use, calibration and maintenance of various types of equipment which play an important role in performing analysis testing.

Audience:

This course is intended for:

1. Laboratory staff
2. Lab chemists
3. Lab technicians

Course objectives:

Upon completion of this course the participates able to

- Understand different laboratory equipment
- Describe different calibration terms
- Recognize the calibration laboratory equipment importance
- Know a brief explanation on the main uses or applications of the equipment in the laboratory.
- Conduct basic routine maintenance, classified according to the required frequency
- Realize troubleshooting tables with the most frequent problems affecting the equipment with possible causes and actions that may resolve these problems.
- Grasp some equipment, additional themes related to calibration, quality

Course duration:

5 days

Course location:

Dubai

Course contents:

Day-1

- **Pre-test**
- **Introduction**
- **Laboratory Equipment Calibration**
 - Basics and Best Practices
 - What is Calibration?
 - Why Calibrate?
 - Calibration Terms
 - Calibration Quality Management Systems
 - Calibration Program Best Practices
 - Determining Calibration Intervals
 - Avoiding Production Delays
 - Calibration, Maybe Not a Do-It-Yourself Operation

Day-2

- **Laboratory equipment Troubleshooting**

- What is the source of the problem?
- Troubleshooting
- When problems cannot be corrected
- Service and repair
- Retiring and disposing of equipment

- **Some General Laboratory Equipment**

- **Balances**

- Photographs of balances
- Purpose of the balance
- Operation principles
- Installation requirements
- Routine maintenance
- Troubleshooting table
- Basic definitions

Day-3

- **Water Bath**

- Diagram of a water bath
- Operation principles
- Water bath controls
- Water bath operation
- Troubleshooting table
- Basic definitions

- **Water Distiller**

- Diagram of a water distiller
- Purpose of the water distiller
- Operation principles
- Installation requirements
- Routine maintenance
- Troubleshooting table
- Basic definitions

- **Pipettes**

- Photographs of pipettes
- Purpose of the pipettes
- Operation principles of the pipette
- Requirements for use
- Using the pipette
- Routine maintenance
- Troubleshooting table
- Basic definitions

- **Stirring Heating Plate**

- Photograph of the stirring heating plate
- Operation principles
- Controls of the stirring heating plate
- Installation requirements

- Operation of the stirring heating plate
- Routine maintenance
- Troubleshooting table
- Basic definitions

Day-4

- **pH Meter**

- Purpose of the equipment
- Photograph and components of the pH meter
- Operation principles
- pH meter components
- Typical circuit
- Installation requirements
- General calibration procedure
- General maintenance of the pH meter
- Basic maintenance of the electrode
- Troubleshooting table
- Basic definitions
- Annex: The pH theory

- **Spectrophotometer**

- Photograph of spectrophotometer
- Purpose of the equipment
- Operation principles
- Spectrophotometer components
- Installation requirements
- Spectrophotometer maintenance
- Good practices when using the spectrophotometer
- Troubleshooting table
- Basic definitions

Day-5

- **Colorimeters**

- Photograph of colorimeter
- Purpose of the colorimeter
- Operating principle
- Components
- Installation requirements
- Operation of the colorimeter
- Routine maintenance
- Troubleshooting table
- Basic definitions

- **Final test**

- **Methodology:**

- 50% lectures & concepts
- 10% Videos
- 10% Case studies
- 10% Exercises

- 10% Discussions
- 10% Software (if applicable or examples)

Course code: (TLAB001)