



TRAINING PROGRAM



Laboratory Equipment And Facilities – Operation – Optimization And Safety

Introduction:

The need for ensuring consistent and high quality products requires continuous measurements and control of processes. Much of this measurement takes place in laboratories through the use of standardized tests and methods. Similarly the development of new products and processes often requires the use of laboratories and of course laboratory equipment. Understanding the principles of operation and the field of application of such equipment is very important for the laboratory operator and the researcher. But even the most sophisticated equipment is no guarantee for reliable results. The equipment operator must understand and employ the correct procedures for calibration, validation of methods and statistical treatment of measurement uncertainty. Of course laboratories must also be safe places to work in as they often handle materials which are hazardous and toxic to the environment and to humans.

Course Certificate:

BTS Consultant certificate will be issued to 80 % attendees completing minimum of full of the total tuition hours of the course.

Who Should Attend?

Research Directors Laboratory managers, Laboratory operators, quality managers, laboratory staff, chemists, chemical engineers.

Course Objectives:

By the end of this course delegates will be able to:

- To give the principles of operation of key laboratory equipment
- To give the principles of reliable laboratory measurements
- To outline key laboratory safety issues and safety measures

Course Outline:

Day 1

- Introduction.
- The laboratory and its purpose.
- The laboratory environment.
- Types of equipment: an overview.
- Laboratory layout and construction.
- Out-of-laboratory services, Electricity, ventilation, water, drains etc.
- Benches, hoods, sinks.
- Glassware.
- Plasticware.

Day 2

- Wet chemistry.
- Instrumental Chemistry.
- Principles of instrumental chemistry.

- Balances.
- Titration.
- Colorimetry.
- Polarography.
- Light absorption.
- Atomic absorption.
- Chromatography.
- Petroleum Laboratory equipment.

Day 3

- Calibration.
- Correlations.
- Reference materials.
- Correct laboratory techniques.
- Statistical principles for Laboratory measurements.
- Reporting of analytical results.

Day 4

- Why is safety important.
- Safety Policy.
- Laboratory Safety.
- Handling of toxic and hazardous materials.
- Spills and spill control.
- Good laboratory practice.
- Material safety data sheets.
- Emergency preparedness.
- Emergency planning.
- Handling of Compressed Gases (Cylinders).
- Destruction of hazardous chemicals in the laboratory.

Day 5

- Examples of calculations
- Exercises
- Course Evaluation
- Course Summary