

**CHEMICAL  
LABORATORY:  
OPERATIONS,  
EQUIPMENTS,  
INSTRUMENTS, QUALITY  
& SAFETY**



**CLE101  
Chemical  
Laboratory  
Engineering,  
Technology &  
Management**

**COURSE TITLE**

**CHEMICAL LABORATORY: OPERATIONS, EQUIPMENTS,  
INSTRUMENTS, QUALITY & SAFETY**

**COURSE DATE/ VENUE**

20 – 24 September 2021

London, UK

**COURSE REFERENCE**

CLE101

**COURSE DURATION**

05 Days

**DISCIPLINE**

Chemical Laboratory Engineering, Technology & Management

**COURSE 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. This course brings all these diverse elements close together and presents a complete picture of chemical

laboratory, equipment selection, installation, operation, quality control system and safety in laboratory.

## **COURSE OBJECTIVE**

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

- ✓ Explain the principles of operation of key laboratory equipment and instruments.
- ✓ Explain the principles of reliable laboratory measurements.
- ✓ Discuss about key laboratory safety issues and safety measures.

## **COURSE AUDIENCE**

Laboratory managers, Laboratory operators, quality managers, laboratory staff, chemists, chemical engineers and technicians.

## **COURSE CONTENT**

- Introduction
- The laboratory and its purpose
- The laboratory environment
- Types of equipment: an overview
- Laboratory layout and construction
- Wet chemistry
- Instrumental Chemistry
- Principles of instrumental chemistry
- Balances
- Titration
- Petroleum Laboratory equipment
- Calibration
- Correlations
- Reference materials
- The Quality Control System
- Statistical principles for Laboratory measurements
- Reporting of analytical results

- 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

### **COURSE CERTIFICATE**

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

### **COURSE FEES**

\$6,150 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

