Aim of Course

The purpose of the course is to provide laboratory personnel with the knowledge to apply basic scientific principles and techniques, to perform routine chemical analyses.

The attendees will benefit from the hands-on approach as well as the principles and theoretical aspects of the equipment. Those attending will also obtain knowledge of practical applications such as handling, optimising and calibration of certain instruments.

These skills and knowledge may also be applied for quality control and assurance.

The following are the expected outcomes of this course:

- Apply principles to perform, use and operate laboratory equipment for chemical analyses in the laboratory and production.
- Use these skills in self-assessment of routine work.

A scientific calculator (such as a Sharp EL 531 or similar) must be brought by each student.

Course Overview

SI Units
Laboratory safety
Basic Nomenclature
Glassware
  - Types
  - Cleaning solutions and cleaning methods
Reagents
  - Different grades of purity of chemicals
  - Contamination of chemicals
Analytical balances
  - Fundamentals of weighing technology
  - Balance check
  - Load cells
  - Compensations
Temperature
  - Different types of thermometers
  - Temperature scales
  - Taking readings
  - Care of thermometers and cleaning up of breakages
Pipetting and titration techniques
  - Different types of pipettes
  - Pipetting technique
  - Titrating technique
  - Calibration of pipette, burette and 100 ml volumetric flask
Basic water chemistry
  - Purity of water and water as solvent
Mole concept
  - Concentration expressions (mol/l; normality; % solution)
  - Preparation of solutions
  - Primary standards
BASIC ANALYTICAL TECHNIQUES (CONT.)

pH measurement
• pH equipment
• pH scale
• Glass electrode and factors affecting the electrode
• Calibration of pH meter

Who should attend

Laboratory technicians, laboratory assistants, analysts, process operators

Course Duration

5 Days

Evaluation

Students are evaluated on attendance, daily tests and the passing of a final examination. The daily tests account for 30% of the final marks and the examination accounts for 70% of the final marks.

The examination will be written approximately two weeks after the completion of the course.