# Lab Testing and Quality Assurance

## CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

| Course title & Code | Credits | Credit distribution of the course | | | Eligibility criteria | Pre-requisite of the course (if any) |
|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical/ Practice | | |
| Lab Testing and Quality Assurance | 2 | 1 | 0 | 1 | Class XII with Science | NIL |

### Learning Objectives:

The objective of this course is:

- To introduce the concept of quality check and quality control in chemical industries.

### Learning Outcomes:

By the end of the course, the students will be able to:

- Describe role of quality control chemist
- Discuss and demonstrate analytical and separation techniques
- Carry out sample preparation
- Illustrate fundamentals of quality check
- Describe and use safety procedures

### SYLLABUS

**Unit 1: Introduction** **2 hours**

Industry and sub-sectors, standards for manufacturing in life-sciences, drug regulatory agencies, role of quality control chemist, quality management systems

**Unit 2: Modern Analytical methods and separation techniques** **5 hours**

Gravimetric methods, volumetric methods, electroanalytical methods, spectroscopic methods,chromatographic techniques

**Unit 3: Sample preparation** **2 hours**

Basics of sample preparation, preservation and storage, standards and guidelines for sample handling, good storage practices

**Unit 4: Quality check** **6 hours**

Overview, productivity concept, statistical analysis of laboratory data, measurements, calibrations, validation, reference standards and materials, requirements of a calibration lab, fundamentals of advanced QC approaches, Trouble shooting in QC, documentation, audit/ process related query, Quality certifications, Government regulations in industries like pharmaceuticals, food supplements, cosmetics.

**Practicals/Hands-on-Training** **30 hours**

1. Calibration of glassware
2. Weighing of samples, accuracy of measurements
3. Preparation of TLC plates and separation of amino acids
4. Working protocols of various laboratory instruments-oven, pH-meter, conductivity meter, water baths, muffle furnace, spectrophotometer.
5. Calibration of instruments like colourimeter, pH-meter, conductivity meter, spectrophotometer using reference standards or reference materials.

Suggested exercise: Visit some industries to study the validation of simple procedures.

**Essential readings:**

- Skoog D.A., West D.M., Holler, F.J., Crouch S.R., **Fundamentals of Analytical Chemistry**, 9th Edition, Cengage learning.
- **Quality control chemist participant manual** prepared by LSSSDC in collaboration with NSDC India.
- iso.org

**Examination scheme and mode:**

Evaluation scheme and mode will be as per the guidelines notified by the University of Delhi.