

## 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	-	1	XII <sup>th</sup> Pass with Science	Basic understanding of chemistry

#### 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 WEEKS)

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 WEEKS)

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

#### Unit 3: Sample preparation

(2 WEEKS)

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

#### Unit 4: Quality check

(6 WEEKS)

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**

**(15 WEEKS )**

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.

### **References:**

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