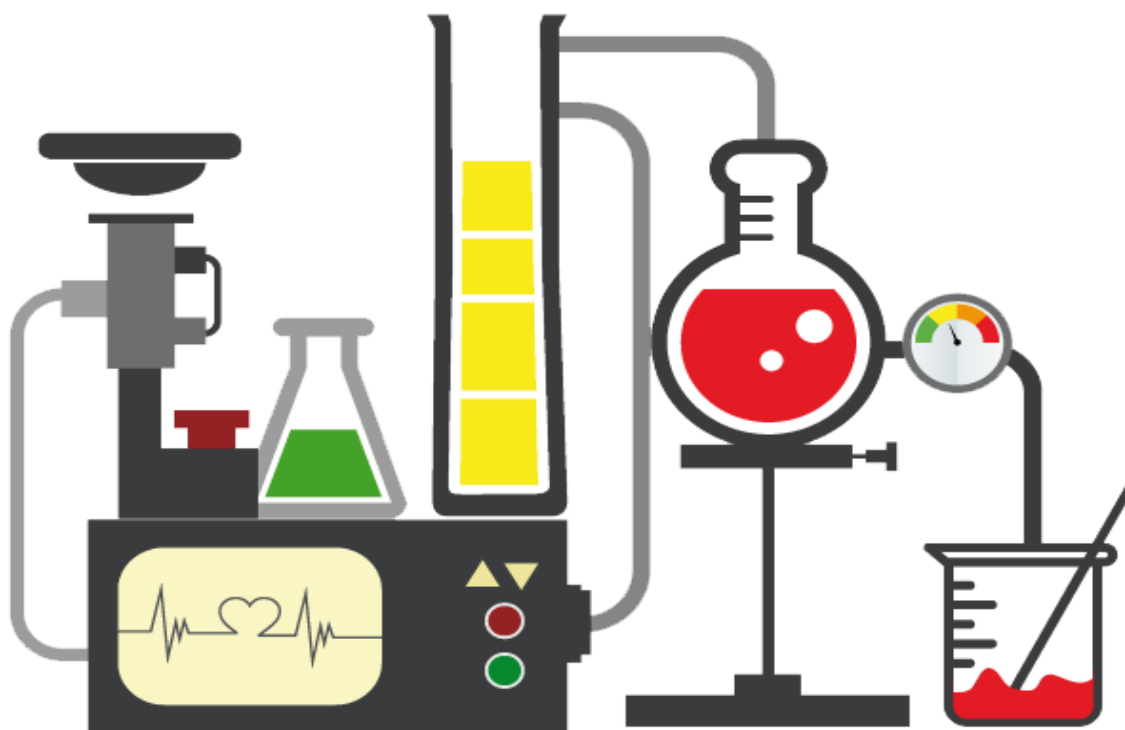


Department of Chemistry

Value added course on

Hands on training on Analytical Instrumentation

(For students at undergraduate and post graduate course level in Sciences)



Introduction

Instrumental analysis is a field of analytical chemistry that investigates analytes using scientific instruments. Instrumental methods of chemical analysis have gained dominance and have become reliable means of obtaining information in several fields of science and technology. As compared to classical methods of analysis which are time consuming and generally low in accuracy, the instrumental methods offer many advantages. These include speed, high sensitivity, high accuracy, capability for multicomponent analysis, low limits of detection, and automated operation. Instrumental analysis is being used in all sciences base fields to gain useful information, make important decisions, and solve problems. Instrumental analysis is being used in several chemical process industries like pharmaceutical industry and in analytical laboratories. Thus a fundamental understanding of principles and working of analytical instruments is a must for the science students. A science postgraduate must be able to handle, operate and apply modern instrumentation to solve problems. The training in scientific instrumentation can help students gain instrumentation skills and enhance their employment prospects.

The Department of Chemistry aims to enhance practical experience of students along with theoretical knowledge by offering various skill enhancement courses and conduct training programmes which meet the industry demands and bring value addition to the candidate's potential.

The hands on training programme in Analytical Instrumentation has been designed with the aim to provide conceptual basic and hands on practical exposure of instruments for thorough understanding of analytical instruments and methods. This training course aims to give practical demonstration on instruments, calibration and method development so the participant can achieve the analytical and interpretative skills which is critical for working in the laboratory. Students who are pursuing their bachelors or master's course or have completed study and want to enter industry can join this course which will provide them the needed training and exposure in the field of analytical instrumentation.

SYLLABUS

Course Name	Hands on training on Analytical Instrumentation
Course Code	VAC-CHE1
Prerequisite	10+2 in Sciences
Duration of Course (Total Hours)	30 hrs
L/T/P	1/0/2

Certification **Certificate will be provided on completing the prescribed hours and passing the final examination which will be of 3 hours durations consisting of viva and practical performance**

Course Objectives

- To enable students understand the principle and working of various analytical instruments.
- To provide hands on experience and enable students operate the analytical instruments.
- To enable students use the analytical instruments for practical applications.

Course Outcomes

- The students will be able to understand the working principle of various analytical instruments.
- The students will be able to handle and operate the scientific instruments.
- The students will be able to use the analytical instruments for practical applications.

Module 1: Colorimetry and UV-Visible Spectroscopy **6 hrs**

Introduction to colorimetry, principles, instrumentation, sample preparation and analysis

Introduction to UV-Vis spectrophotometry, principles, instrumentation, sample preparation and analysis

Module 2: Fluorescence Spectroscopy **6 hrs**

Introduction, principle, instrumentation, sample preparation, sample analysis and applications.

Module 3: FT-IR Spectroscopy **6 hrs**

Introduction to IR spectroscopy, principle, instrumentation, sample preparation (pellet making), applications

Interpretation of IR spectra of solids (some examples)

Module 4: Gas Chromatography (GC) **6 hrs**

Introduction to chromatography, principle of gas chromatography, instrumentation of gas chromatography, sample preparation and applications

Module 5: High Performance Liquid Chromatography (HPLC) **6hrs**

Introduction to HPLC, principle and instrumentation of HPLC, sample preparation and applications, interpretation of chromatogram