BS Chemistry Semester-III					
Programme	**BS Chemistry**	**Course Code**	**Chem-246L**	**Credit Hours**	**1**
Course Title	**Analytical Data Handling (Lab.I)**		**Course Type**	**Major Elective**	

Course Introduction

This course will help the students in assessing the analytical data regarding calibration. The students will be able to apply various statistical tests to interpret their observations and the obtained data of analytical apparatus.

Calibration

Calibration of glassware (pipette, burette and flask) used for volumetric analysis. Use of analytical balance and calculation of standard deviation. Calibration of pH meter and determination of pH of various acidic and basic solution.

Calibration of conductometer and determination of conductance of tap water, distilled water, conductivity water and canal water.

Calculation of dissociation constants of various acids.

Calculation of variance, mean, median, coefficient of variance of the data.

Learning Outcomes

On the completion of the course, the students will:

1. Accurately calibrate pipettes, burettes, and flasks used in volumetric analysis.
2. Properly use an analytical balance and calculate standard deviations.
3. Calibrate pH meters and determine the pH of various solutions.
4. Calibrate conductometers and measure the conductance of different water samples.
5. Calculate dissociation constants of various acids.
6. Calculate variance, mean, median, and coefficient of variance for given data.

	Course Content	Assignments/Readings
Week 1	Introduction to Calibration and Volumetric Analysis Overview of calibration and its importance in analytical chemistry. Introduction to volumetric analysis and common glassware.	Collect the material from recommended books and perform experiments
Week 2	Calibration of Pipettes Calibration procedures for pipettes. Practical session on calibrating a pipette.	Collect the material from recommended books and perform experiments
Week 3	Calibration of Burettes Calibration procedures for burettes. Practical session on calibrating a burette.	Collect the material from recommended books and perform experiments
Week 4	Calibration of Flasks Calibration procedures for flasks. Practical session on calibrating a flask.	Collect the material from recommended books and perform experiments
Week 5	Use of Analytical Balance Introduction to the analytical balance. Practical session on using an analytical balance.	Collect the material from recommended books and perform experiments
Week 6	Calculation of Standard Deviation Theory behind standard deviation. Practical session on calculating standard deviation	Collect the material from recommended books and perform experiments

	from sample data.	
Week 7	Calibration of pH Meter Calibration procedures for pH meters. Practical session on calibrating a pH meter.	Collect the material from recommended books and perform experiments
Week 8	Mid-term assessment	
Week 9	Determination of pH of Solutions Practical session on determining the pH of various acidic and basic solutions.	Collect the material from recommended books and perform experiments
Week 10	Calibration of Conductometer Calibration procedures for conductometers. Practical session on calibrating a conductometer.	Collect the material from recommended books and perform experiments
Week 11	Determination of Conductance Determining the conductance of tap water, distilled water, conductivity water, and canal water.	Collect the material from recommended books and perform experiments
Week 12	Calculation of Dissociation Constants Theory behind dissociation constants. Practical session on calculating dissociation constants of various acids.	Collect the material from recommended books and perform experiments
Week 13	Calculation of Mean and Median Theory behind mean and median. Practical session on calculating mean and median from sample data.	Collect the material from recommended books and perform experiments
Week 14	Calculation of Variance Theory behind variance and coefficient of variance. Practical session on calculating variance and coefficient of variance from sample data.	Collect the material from recommended books and perform experiments
Week 15	Review and Practice Practice sessions on various techniques covered in the course.	Collect the material from recommended books and perform experiments
Week 16	Review of all calibration and calculation methods. Comprehensive practical exam.	

Textbooks and Reading Material

5. Vogels, a text book of quantitative inorganic analysis by J. Bassett. The English language book Society and Longman.

Teaching Learning Strategies

6. Lecturing using white/black board/Multimedia
7. Class activities and discussion
8. Quiz about last lecture
9. Presentations

Assignments: Types and Number with Calendar			
Assignments, quiz, Tasks, Presentation etc.			
Assessment			
Sr. No.	**Elements**	**Weightage**	**Details**
4.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
5.	Formative Assessment	25%	Continuous assessment includes: Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on-activities, short tests, projects, practical, reflections, readings, quizzes etc.
6.	Final Assessment	40%	Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.