BS Chemistry Semester-IV					
Programme	**BS Chemistry**	**Course Code**	**CHEM-218**	**Credit Hours**	1
Course Title	**Inorganic Chemistry Lab**		**Course type**	**Major**	

Course Introduction

The course is organized to provide an adequate knowledge about chemical nature and general concepts of redox and acid-base titrations along with gravimetric analysis of water samples.

Redox Titrations

Determine the amount/L of $FeSO_4.7H_2O$ hydrate using potassium dichromate. Determine of %of Iron in ferric Alum using $K_2Cr_2O_7$. Determination of no. of water molecules in $FeSO_4.xH_2O$ using $K_2Cr_2O_7$.

Acid Base Titrations

Standardization of NaOH using oxalic as primary standard. Determine the amount/L of Oxalic acid in given sample. Determine the amount/L of HCl in given sample. Determine the amount/L of H_2SO_4 in given sample. Determine the amount/L of HNO_3 in given sample.

Gravimetric Analysis

Determination of barium ions in a given sample, Determination of chloride ions in a given solution. Determination of Oxalate ions in a given solution. Determination of Sulphate ions in a given solution.

Learning Outcomes

On the completion of the course, the students will be able to:

1. Understand the types of titrations.
2. Acquire the basic knowledge of acid base and redox titrations.
3. Understand the chemistry behind gravimetry to analyze water samples.

	Course Content	Assignments/Readings
Week 1	Introduction about Lab safety and solution preparations, primary and secondary standards substances for solution preparations.	Sample solution practices Analysis and written task
Week 2	Introduction of Volumetric analysis by different types of titrations.	Sample solution practices Analysis and written task
Week 3	Determine the amount/L of $FeSO_4.7H_2O$ hydrate using potassium dichromate.	Sample solution practices Analysis and written task
Week 4	Determine of %of Iron in ferric Alum using $K_2Cr_2O_7$.	Sample solution practices Analysis and written task
Week 5	Determination of no. of water molecules in $FeSO_4.xH_2O$ using $K_2Cr_2O_7$.	Sample solution practices Analysis and written task
Week 6	Standardization of NaOH using oxalic as primary standard.	Sample solution practices Analysis and written task
Week 7	Determine the amount/L of Oxalic acid in given sample.	Sample solution practices Analysis and written task
Week 8	Determine the amount/L of HCl in given sample.	Sample solution practices Analysis and written task
Week 9	Mid term assessment	

Week 10	Determine the amount/L of H_2SO_4 in given sample.	Sample solution practices
		Analysis and written task
Week 11	Determine the amount/L of HNO_3 in given sample.	Sample solution practices
		Analysis and written task
Week 12	Determination of barium ions in a given sample	Sample solution practices
		Analysis and written task
Week 13	Determination of chloride ions in a given solution.	Sample solution practices
		Analysis and written task
Week 14	Determination of Oxalate ions in a given solution.	Sample solution practices
		Analysis and written task
Week 15	Determination of Sulphate ions in a given solution.	Sample solution practices
		Analysis and written task
Week 16	Revision of overall aspects of acid base, redox and gravimetric analysis.	Sample solution practices
		Analysis and written task

Textbooks and Reading Material

1. Hill, R. H. JR and Fister, D. C.,(2010), " *Laboratory Safety for Chemistry Students",* John-Wiley & Sons, Inc.
2. Mendham, J., Denny, R. C., Barnes, J. D., Thomas, M. and Sivasankar, B.,(2000), "*Vogel's Textbook of Quantitative Chemical Analysis",* 6th ed., Pearson Education, Ltd.
3. Svehla, G.,(2009), "*Vogel's Qualitative Inorganic Analysis",* 7th ed., (7th imp.), Pearson Education, Ltd.
4. Rehman, R., and Bhatti, H.N., (2013), "*Inorganic Chemistry, Laboratory Manual*", Carvan Book House Lahore.
5. Rehman, R., and Bhatti, H.N.,(2015), "*Experimental Inorganic Chemistry*", Carvan Book House Lahore.

Teaching Learning Strategies

1. Lab based practice
2. Examination (Objective and Subjective)
3. Assignments
4. Class discussion

Assignments: Types and Number with Calendar

1. Redox and acid base titrations and their applications.
2. Gravimetry and its applications.