

Semester-V					
Programme	BS Chemistry	Course Code	CHEM-302	Credit Hours	1
Course Title	Physical Chemistry (Lab)		Course Type	Major Elective	
Course Introduction					
This course focuses on practical techniques in physical chemistry, including the preparation of buffer solutions, conductometric and potentiometric titrations, and the determination of Equivalence conductance to verify Ostwald’s law. Here is a brief description of course outlines: Preparation of buffer solution (CH₃COOH and CH₃COONa) of a certain pH. Determination of the equivalence conductance of solution of weak electrolyte at various dilutions at room temperature to verify Oswald’s law. Determination of the strength of given solution of HCl by titrating it against standard solution of NaOH using conductomertic method. Determination of concentration of acetic acid solution by titrating it against standard solution of NaOH using conductomertic method. Determination of concentrations of HCl and CH₃COOH in the given mixture of both by titrating it against standard NaOH solution conductometrically. Determination of the strength of given solution of HCl by titrating it against standard solution of NaOH using potentiometric/pH measurement method.					
Learning Outcomes					
On the completion of the course, the students will be able to: 1. prepare buffer solutions with specific pH values 2. determine the equivalence conductance of weak electrolytes to verify Ostwald’s law 3. accurately measure the concentrations of various acids and acid mixtures using conductometric and potentiometric titration methods					
Course Content			Assignments/Readings		
Week 1	Preparation of buffer solution (CH ₃ COOH and CH ₃ COONa) of a certain pH.				
	Continued				
Week 2	Continued				
	Continued				
Week 3	Continued				
	Determination of the equivalence conductance of solution of weak electrolyte at various dilutions at room temperature to verify Oswald’s law.				
Week 4	Continued				
	Continued				
Week 5	Continued				
	Continued				
Week 6	Determination of the strength of given solution of HCl by titrating it against standard solution of NaOH using conductomertic method.				
	Continued				
Week 7	Continued				
	Continued				

Week 8	Mid Term Examinations	
Week 9	Determination of concentration of acetic acid solution by titrating it against standard solution of NaOH using conductometric method.	
	Continued	
Week 10	Continued	
	Continued	
Week 11	Determination of concentrations of HCl and CH ₃ COOH in the given mixture of both by titrating it against standard NaOH solution conductometrically.	
	Continued	
Week 12	Continued	
	Continued	
Week 13	Determination of the strength of given solution of HCl by titrating it against standard solution of NaOH using potentiometric/pH measurement method.	
	Continued	
Week 14	Continued	
	Continued	
Week 15	Continued	
	Continued	
Week 16	Final Term Examinations	
Textbooks and Reading Material		
1. Garland, C. W., Nibler, J. W., Shoemaker, D. P., Experiments in Physical Chemistry, 6th ed., WCB McGraw-Hill, 1996.		
2. Singh, A., Advanced Experimental Physical Chemistry, Campus Books International, 2007.		
3. Daniels F., Experimental Physical Chemistry, 7th ed., McGraw-Hill College, 1970.		
4. Matthews, G. P., Experimental Physical Chemistry, Oxford University Press, 1986.		
5. Bhatti, H. N. & Farooqi, Z. H., Experimental Physical Chemistry for Graduate and Postgraduate Students, Revised ed., Caravan Book House, Lahore, 2014.		
Teaching Learning Strategies		
1. Lectures		
2. Group Discussion		
3. Laboratory work		
4. Seminar/ Workshop		
Assignments: Types and Number with Calendar		
1. Lab activities and practical performance from week 1 to week 16.		
2. Literature review based assignment relevant to the course will also be given during the course.		