



SILVER OAK UNIVERSITY

Silver Oak College of Pharmacy (067)

Programme Name: B. Pharm (18)

Subject Name: Pharmaceutical Analysis I

Subject Code: 1180673102

Semester: I

Prerequisite:

This course deals with the fundamentals of analytical chemistry and principles of electrochemical analysis of Drugs

Objective: Upon completion of the course student shall be able to

1. Understand the principles of volumetric and electro chemical analysis
2. Carryout various volumetric and electrochemical titrations
3. Develop analytical skills

Teaching Scheme:

Teaching Scheme				
L	T	P	Contact Hours	Credit
3	1	4	8	6

Content:

Unit No.	Contents	Teaching Hours	Weightage %
1	<p>(a) Pharmaceutical analysis- Definition and scope</p> <p>i) Different techniques of analysis</p> <p>ii) Methods of expressing concentration</p> <p>iii) Primary and secondary standards.</p> <p>iv) Preparation and standardization of various molar and normal solutions- Oxalic acid, sodium hydroxide, hydrochloric acid, sodium thiosulphate, Sulphuric acid, potassium permanganate and ceric ammonium sulphat</p> <p>(b) Errors: Sources of errors, types of errors, methods of minimizing errors, accuracy, precision and significant figures</p> <p>(c) Pharmacopoeia, Sources of impurities in medicinal agents, limit tests.</p>	10	22%
2	Acid base titration: Theories of acid base indicators, classification of acid base titrations and theory involved in	10	22%

	<p>titrations of strong, weak, and very weak acids and bases, neutralization curves</p> <p>Non aqueous titration: Solvents, acidimetry and alkalimetry titration and estimation of Sodium benzoate and Ephedrine HCl</p>		
3	<p>Precipitation titrations: Mohr's method, Volhard's, Modified Volhard's, Fajans method, estimation of sodium chloride.</p> <p>Complexometric titration: Classification, metal ion indicators, masking and demasking reagents, estimation of Magnesium sulphate, and calcium gluconate.</p> <p>Gravimetry: Principle and steps involved in gravimetric analysis. Purity of the precipitate: co-precipitation and post precipitation, Estimation of barium sulphate.</p> <p>Basic Principles, methods and application of diazotization</p>	10	22%
4	<p>Redox titrations</p> <p>(a) Concepts of oxidation and reduction</p> <p>(b) Types of redox titrations (Principles and applications)</p> <p>Cerimetry, Iodimetry, Iodometry, Bromatometry, Dichrometry, Titration with potassium iodate</p>	8	18%
5	<p>Electrochemical methods of analysis</p> <p>Conductometry- Introduction, Conductivity cell, Conductometric titrations, applications.</p> <p>Potentiometry - Electrochemical cell, construction and working of reference (Standard hydrogen, silver chloride electrode and calomel electrode) and indicator electrodes (metal electrodes and glass electrode), methods to determine end point of potentiometric titration and applications.</p> <p>Polarography - Principle, Ilkovic equation, construction and working of dropping mercury electrode and rotating platinum electrode, applications</p>	7	16%

Course Outcome: After completion of subject students will able to

Sr. No.	CO statement	Unit No
CO-1	Learning this subject content will develop the ideas with the fundamental of analytical chemistry among the pupil.	1
CO-2	Explain basic concepts and principles of non-aqueous and acid base titrations	2
CO-3	Clarify different terms, basic principles and reaction conditions of precipitation, Complexation and Gravimetric Analysis.	3
CO-4	Understand and explain the Types and importance of Redox titration	4
CO-5	It peculates the basic knowledge in the principles of electrochemical analytical techniques	5

Teaching & Learning Methodology: -

The various methods or tools follows by the faculties to teach the above subject are:

1. Student-centred learning.
2. Experiential learning.

Experiments:

Students will perform following Experiments

1. Limit Test of the following

- (1) Chloride
- (2) Sulphate
- (3) Iron
- (4) Arseni

2. Preparation and standardization of

- (1) Sodium hydroxide
- (2) Sulphuric acid
- (3) Sodium thiosulfate
- (4) Potassium permanganate
- (5) Ceric ammonium sulphat

3. Assay of the following compounds along with Standardization of Titrant

- (1) Ammonium chloride by acid base titration
- (2) Ferrous sulphate by Cerimetry
- (3) Copper sulphate by Iodometry
- (4) Calcium gluconate by complexometry
- (5) Hydrogen peroxide by Permanganometry
- (6) Sodium benzoate by non-aqueous titration
- (7) Sodium Chloride by precipitation titration

4.Determination of Normality by electro-analytical methods

- (1) Conductometric titration of strong acid against strong base
- (2) Conductometric titration of strong acid and weak acid against strong base
- (3) Potentiometric titration of strong acid against strong base

Books Recommended: -

1. A.H. Beckett & J.B. Stenlake's, Practical Pharmaceutical Chemistry Vol I & II, Stahlone Press of University of London
2. A.I. Vogel, Text Book of Quantitative Inorganic analysis
3. P. Gundu Rao, Inorganic Pharmaceutical Chemistry
4. Bentley and Driver's Textbook of Pharmaceutical Chemistry
5. John H. Kennedy, Analytical chemistry principles
6. Indian Pharmacopoeia.

CO-PO-PSO Matrix:

Co. No.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO-1	3	1	2	1	-	3	-	2	2	3	2	2	2
CO-2	3	2	2	2	-	2	-	2	1	2	2	2	3
CO-3	3	1	2	1	-	2	-	2	2	3	3	2	3
CO-4	3	2	2	3	-	2	-	1	2	2	2	3	2
CO-5	3	1	2	1	2	2	-	2	2	3	2	2	3