



Faculty of Pharmacy
Bachelor of Pharmacy (B. Pharm.)
(W. E. F.: 2023-24)
Document ID: SUTEPHB-01

Name of Faculty	:	Faculty of Pharmacy
Name of Program	:	Bachelor of Pharmacy
Course Code	:	1BPH02
Course Title	:	Pharmaceutical Analysis I
Type of Course	:	Basic Pharmaceutical Sciences
Year of Introduction	:	2023-24

Prerequisite	:	Zeal to learn the subject
Course Objective	:	This course deals with the fundamentals of analytical chemistry and principles of electrochemical analysis of drugs.
Course Outcomes	:	At the end of this course, students will be able to:
	CO1	To understand basic apparatus and instruments and their calibration.
	CO2	To understand pharmaceutical reagents and their standardization.
	CO3	To describe(apply) concept of various volumetric analysis
	CO4	To learn (understand) concept of various electrochemical titrations
	CO5	To know (remember) analytical skills in data interpretation and calculations

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	SEE	CIA	SEE	CIA	
03	01	04	06	75	25	35	15	150

Legends: L-Lecture; T-Tutorial/Teacher Guided Theory Practice; P – Practical, C – Credit, SEE – Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with COs
1	Pharmaceutical analysis- Definition and scope Different techniques of analysis Methods of expressing concentration Primary and secondary standards. Preparation and standardization of various molar and normal solutions- Oxalic acid, sodium hydroxide, hydrochloric acid, sodium thiosulphate, sulphuric acid, potassium permanganate and ceric ammonium sulphate. Errors: Sources of errors, types of errors, methods of minimizing errors, develop analytical skills accuracy, precision and significant figures Pharmacopoeia: Sources of impurities in medicinal agents, limit tests	10	5%	CO1 CO2 CO5
2	Non aqueous titration: Solvents, acidimetry and alkalimetry titration and estimation develop analytical skills. Acid base titration: Theories of acid base indicators, classification of acid base titrations and theory involved in titrations of strong, weak, and very weak acids and bases, neutralization curves.	10	15%	CO2 CO3
3	Precipitation titrations: Theories of acid base indicators, classification of acid base titrations and theory involved in titrations of strong, weak, and very weak acids and bases, neutralization curves. Complexometric titration: Classification, metal ion indicators, masking and demasking reagents, estimation of Magnesium sulphate, and calcium gluconate. Gravimetry: Principle and steps involved in gravimetric analysis. Purity of the precipitate: coprecipitation and post precipitation, Estimation of barium sulphate. Basic Principles, methods and application of diazotisation titration.	10	15%	CO2 CO3
4	Redox titrations (A) Concepts of oxidation and reduction (B) Types of redox titrations (Principles and	08	15%	CO2 CO3

	applications) Cerimetry, Iodimetry, Iodometry, Bromometry, Dichrometry, Titration with potassium iodate			
5	Electrochemical methods of analysis Conductometry- Introduction, Conductivity cell, Conductometric titrations, applications. 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. Polarography - Principle, Ilkovic equation, construction and working of dropping mercury electrode and rotating platinum electrode, applications	07	5%	CO2 CO4

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	20	60	20	00	00	00

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Limit Test of the following Chloride Sulphate Iron Arsenic	15
2	Preparation and standardization of Sodium hydroxide Sulphuric acid Sodium thiosulfate Potassium permanganate Ceric ammonium sulphate	15
3	Assay of the following compounds along with Standardization of Titrant	15



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	Ammonium chloride by acid base titration Ferrous sulphate by Cerimetry Copper sulphate by Iodometry Calcium gluconate by complexometric Hydrogen peroxide by Permanganometry Sodium benzoate by non-aqueous titration Sodium Chloride by precipitation titration	
4	Determination of Normality by electro-analytical methods Conductometric titration of strong acid against strong base. Conductometric titration of strong acid and weak acid against strong base. Potentiometric titration of strong acid against strong base.	15

Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	Digital Balance
2	Burette
3	Pipette
4	Conical Flask

Suggested Learning Websites

Sr. No.	Name of Website
1	https://pci.nic.in/pdf/Syllabus_B_Pharm.pdf
2	https://www.aicte-india.org/downloads/bpharma.pdf
3	https://www.ipc.gov.in/
4	https://www.ayush.gov.in/
5	https://ayudmla.gujarat.gov.in/home.php
6	https://www.fda.gov/
7	https://www.pharmacopoeia.com/
8	https://ipapharma.org/
9	https://gpat.nta.nic.in/
10	https://drnaitikrivedi.com/
11	https://gdc4gpat.com/course/gpat/
12	https://niscpr.res.in/
13	https://delnet.in/
14	https://ihubgujarat.in/
15	https://www.ssipgujarat.in/



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Reference Books

Sr. No.	Name of Reference Books
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.