Program	Master of Pharmacy (M.Pharm)	**Semester - 1**
Type of Course	-	
Prerequisite		
Course Objective	-	
Effective From A.Y.	2023-24	

Teaching Scheme (Contact Hours)				Examination Scheme				
				Theory Marks		Practical Marks		
Lecture	Tutorial	Lab	Credit	External Marks (T)	Internal Marks (T)	External Marks (P)	Internal Marks (P)	Total Marks
-	-	12	6	-	-	100	50	150

SEE *- Semester End Examination,* ***CIA*** *- Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**Practical** Analysis of Pharmacopoeial compounds in bulk and in their formulations (tablet/ capsules/ semisolids) by UV Vis spectrophotometer	20	5
2	**Practical** Simultaneous estimation of multi-drug component containing formulations by UV spectrophotometry	12	10
3	**Practical** Experiments based on HPLC	8	5
4	**Practical** Experiments based on Gas Chromatography	4	3
5	**Practical** Estimation of riboflavin/quinine sulphate by fluorimetry	8	5
6	**Practical** Estimation of sodium/potassium by flame photometry or AAS	4	2
7	**Practical** Case studies on: • Total Quality Management • Six Sigma • Change Management/ Change control. Deviations, • Out of Specifications (OOS) • Out of Trend (OOT) • Corrective & Preventive Actions (CAPA) • Deviations	16	5
8	**Practical** Development of Stability study protocol	4	5
9	**Practical** Estimation of process capability	4	5
10	**Practical** In process and finished product quality control tests for tablets, capsules, parenterals and semisolid dosage forms.	30	10
11	**Practical**	8	5

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
	Assay of raw materials as per official monographs		
12	**Practical** Testing of related and foreign substances in drugs and raw materials	4	5
13	**Practical** To carry out pre formulation study for tablets, parenterals	16	5
14	**Practical** To study the effect of pH on the solubility of drugs	4	5
15	**Practical** Quality control tests for Primary and secondary packaging materials	6	5
16	**Practical** Accelerated stability studies	8	5
17	**Practical** Improved solubility of drugs using surfactant systems	8	5
18	**Practical** Improved solubility of drugs using co-solvency method	8	5
19	**Practical** Determination of Pka and Log p of drug	8	5
	Total	180	100

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	20	30	20	10	10	10

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.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Basic knowlegde of the analytical methods for estimation of drugs in single and combined dosage form
CO2	Ability to perform preformulation study of drugs, in pocess and finished product quality control tests for vaious dosage forms and enhancement of solubity of drugs

Reference Books

1.	**Analytical Chemistry (TextBook)** By G.D. Christian | Wiley India | 6TH, Pub. Year 2007
2.	**Pharmaceutical Analysis** By D.G. Watson | Harcourt Publishers Ltd | 1ST, Pub. Year 2000
3.	**Textbook of Pharmaceutical Analysis (TextBook)** By K.A. Conners | John Wiley & Sons | 3RD, Pub. Year 2004
4.	**Practical pharmaceutical chemistry (TextBook)** By A.H.Beckett, J.B.Stenlake | CBS PUBLISHER | 4TH, Pub. Year 2010
5.	**Indian Pharmacopoeia** By Government of India, Ministry of Health and Family Welfare | Indian Pharmacopoeia Commission, Ghaziabad, India, Pub. Year 2022
6.	**Vogel's Textbook of Quantitative Chemical Analysis** By J MENDHAM,RC DENNEY,J D BARES,M THOMAS,B SIVASANKAR | PEARSON | 6 TH, Pub. Year 1989
7.	**Laboratory handbook in Instrumental analysis (TextBook)** By Dr. Kalpana Patel, Dr.Pruvi shah, Hitesh Raval | Nirav Prakashan | 1ST, Pub. Year 2013

List of Practical

1.	To carry out assay of Paracetamol by UV spectrophotometric method as per the IP 2022
2.	To determine % w/w of Paracetamol in given tablet by colorimetric method.
3.	To determine %w/w of Ofloxacin in given tablet by Colorimetric method.
4.	To perform assay of Indomethacin using UV spectroscopic method.
5.	Determination of Chloramphenicol from its ointment by UV-Visible Spectroscopy.
6.	To estimate the amount of quinine sulphate present in given sample by photo fluorimetry.
7.	To determine amount of Caffeine and Sodium Benzoate in mixture by UV spectroscopy using simultaneous equation method.
8.	To determine amount of Caffeine and Sodium Benzoate in mixture by UV spectroscopy using absorbance ratio method.
9.	To determine amount of Ornidazole and Ofloxacin by Simultaneous equation method.
10.	To determine amount of Ornidazole and Ofloxacin by absorption ratio method.
11.	To determine amount of Ornidazole and Ofloxacin by 1 st order derivative method.
12.	To determine amount of Paracetamol and Ibuprofen by absorption ratio method in Combiflam.
13.	To determine amount of Paracetamol and Ibuprofen by simultaneous equation method in Combiflam.
14.	To determine amount of Paracetamol and Ibuprofen by 1 st order derivative method in Combiflam.
15.	To estimate Paracetamol by HPLC method.
16.	Demonstration for Development of stability Study Protocol for API & Finished Pharmaceutical products
17.	To carry out Preformulation study for tablets (Paracetamol)
18.	To perform in process and finished product Quality Control tests for tablet (Paracetamol)
19.	To carry out Preformulation study for Parentrals (Diclofenac Sodium)
20.	To perform in process and finished product quality control test for Parentrals (Diclofenac sodium)
21.	To perform in process and finished product quality control tests for semisolid dosage forms
22.	To carry out Preformulation study for tablets (Aspirin)
23.	To perform in process and finished product Quality Control tests for tablet (Aspirin)
24.	To Perform Assay of Raw materials as per official monographs
25.	To study the effect of pH on the solubility of drugs (Paracetamol)
26.	To perform Quality control testes for Primary and secondary packaging materials
27.	To perform Accelerated stability studies
28.	To study the improved solubility of drugs (Paracetamol) using surfactant system
29.	To study the improved solubility of drugs (Amlodipine) using co-solvency method
30.	To determine Pka and Log P of Salicylic acid
31.	To study case study on Out of Specification (OOS)
32.	To study case study on Out of Trend (OOT)
33.	To study case study on Six Sigma
34.	To study case study on total quality management (TQM)
35.	To study case study on Corrective and Preventive Action (CAPA)