COURSE HANDOUT

PHARMACEUTICS-I (THEORY) COURSE

CODE: BP103T

VISION

Train the minds to think logically and become a success

MISSION

To Develop inventive, pioneering research & high-quality technical education

PROGRAMME EDUCATIONAL OBJECTIVES

PEO 1: To produce graduates with sound theoretical knowledge and technical skills required for career opportunities in various domains.

PEO 2: To incite the students towards research and to address the challenges with their innovative Contributions for the benefit of mankind.

PEO 3: To bring forth a quality professional equipped with technological advances to adapt easily to changes in the ever-evolving pharma and allied industry, hospital and clinical pharmacy setup, pharma retailing and distribution, and governmental and health agencies.

PEO 4: To engage graduates in professional ethical practices in a multidisciplinary environment, while contributing to organization through leadership and building team spirit.

PEO 5: Pharmacists can become lifelong learners, absorb new technologies, and then offer leadership roles in society.

Programme Name	Bachelor of Pharmacy (B. Pharmacy)
Course Name	Pharmaceutics-I (Theory)
Course Code	BP103T
Session	
Semester	I
Lecture/Tutorial (Per Week)	3 (3-1-0)
Course Credit	4
Course Coordinator Name	

1. Scope of the Course:

This course is designed to impart fundamental knowledge on preparatory pharmacy with the arts and science of preparing the different conventional dosage forms.

2. Course Outcomes (COs):

103.1. Know about the history, scope of pharmacy, and various drug information sources.

103.2. Understand the basics of pharmaceutical calculations.

103.3. Acquire knowledge of various conventional dosage forms.

103.4. Work as a professional pharmacist with ethical and social responsibilities in prescription reading and dispensing of drugs.

103.5. Gain knowledge regarding physical, chemical and therapeutic incompatibilities with their correction and dispensing methods.

3. Text Books:

- TB1: Ansel HC. Pharmaceutical Dosage Form and Drug Delivery System. Lippincott.
- TB2: Carter SJ. Cooper and Gunn's Dispensing for Pharmaceutical Students, CBS publishers, New Delhi.
- TB3: Carter SJ. Cooper and Gunn's. Tutorial Pharmacy, CBS Publications, New Delhi.
- TB4: Lachmann. Theory and Practice of Industrial Pharmacy. Lea & Febiger Publisher.

4. Reference Books:

- RB1: Indian Pharmacopoeia.
- RB2: British Pharmacopoeia.
- RB3: Florence AT. Modern Pharmaceutics Applications and Advances.
- RB4: Lieberman HA, Rieger MM, Banker GS. Pharmaceutical Dosage Forms Disperse System.

5. Other Readings & Relevant Websites:

Sr. No.	Link of Journals, Magazines, Websites and Research Papers
1	https://www.slideshare.net/swetakamboj/edit_my_uploads
2	https://www.pharmacytimes.com/
3	https://pubmed.ncbi.nlm.nih.gov/
4	https://nptel.ac.in/courses/127105232/

6. Course Plan:

Subject: Pharmaceutics-I (Theory)		**Subject Code:** BP103T
Sr. No.	**Topics**	**No. of Lectures**
1	**Historical background and development of profession of pharmacy:** History of profession of Pharmacy in India in relation to pharmacy education, industry and organization, Pharmacy as a career, Pharmacopoeias: Introduction to IP, BP, USP and Extra Pharmacopoeia. **Dosage forms:** Introduction to dosage forms, classification and definitions **Prescription:** Definition, Parts of prescription, handling of prescription and errors in prescription. **Posology:** Definition, Factors affecting posology. Pediatric dose calculations based on age, body weight and body surface area.	10
2	**Pharmaceutical calculations:** Weights and measures – Imperial & Metric system, Calculations involving percentage solutions, alligation, proof spirit and isotonic solutions based on freezing point and molecular weight. **Powders:** Definition, classification, advantages and disadvantages, Simple & compound powders – official preparations, dusting powders, effervescent, efflorescent and hygroscopic powders, eutectic mixtures. Geometric dilutions. **Liquid dosage forms:** Advantages and disadvantages of liquid dosage forms. Excipients used in formulation of liquid dosage forms. Solubility enhancement techniques.	10
3	**Monophasic liquids:** Definitions and preparations of Gargles, Mouthwashes, Throat Paint, Eardrops, Nasal drops, Enemas, Syrups, Elixirs, Liniments and Lotions.	02
ST-I (Syllabus Covered from Lecture 01 to 22)		
4	**Biphasic liquids: Suspensions:** Definition, advantages and disadvantages, classifications, Preparation of suspensions; Flocculated and Deflocculated suspension & stability problems and methods to overcome. **Emulsions:** Definition, classification, emulsifying agent, test for the identification of type of Emulsion, Methods of preparation & stability problems and methods to overcome.	08
5	**Suppositories:** Definition, types, advantages and disadvantages, types of bases, methods of preparations. Displacement value & its calculations, evaluation of suppositories. **Pharmaceutical incompatibilities:** Definition, classification, physical, chemical and therapeutic incompatibilities with examples.	07
6	**Semisolid dosage forms:** Definitions, classification, mechanisms and factors influencing dermal penetration of drugs. Preparation of ointments, pastes, creams and gels. Excipients used in semi solid dosage forms. Evaluation of semi solid dosages forms.	08
ST- II (Syllabus Covered from Lecture 23 to 45)		

7. Lecture Plan:

Sr. No.	Topics	Dates (tentative)		CO
		Section A	Section B	
01	Historical background and development of profession of pharmacy	12.09.23	11.09.23	103.1
02	Industry and organization, Pharmacy as a career	14.09.23	13.09.23	103.1
03	Pharmacopoeias: Introduction to IP, BP	15.09.23	15.09.23	103.1
04	BP, USP and Extra Pharmacopoeia	19.09.23	18.09.23	103.1
05	Dosage forms: Introduction to dosage forms	21.09.23	20.09.23	103.1
06	Classification and definitions	22.09.23	22.09.23	103.1
07	Prescription: Definition, Parts of prescription	26.09.23	25.09.23	103.1
08	Handling of Prescription and `Errors in prescription	28.09.23	27.09.23	103.1
09	Posology: Definition, Factors affecting posology	29.09.23	29.09.23	103.1
10	Pediatric dose calculations based on age, body weight and body surface area	03.10.23	04.10.23	103.1
11	Pharmaceutical calculations	05.10.23	06.10.23	103.2
12	Calculations involving percentage solutions, allegation	06.10.23	09.10.23	103.2
13	Proof spirit and isotonic solutions based on freezing point and molecular weight.	10.10.23	11.10.23	103.2
14	Powders: Definition, classification, advantages and disadvantages, Simple & compound powders	12.10.23	13.10.23	103.2
15	Official preparations, dusting powders	13.10.23	16.10.23	103.2
16	effervescent, efflorescent and hygroscopic powders	17.10.23	18.10.23	103.2
17	Eutectic mixtures. Geometric dilutions	19.10.23	20.10.23	103.2
18	Liquid dosage forms: Advantages and disadvantages of liquid dosage forms.	20.10.23	23.10.23	103.2
19	Excipients used in formulation of liquid dosage forms.	26.10.23	25.10.23	103.2
20	Solubility enhancement techniques	27.10.23	27.10.23	103.2
21	Monophasic liquids: Definitions and preparations of Gargles, Mouthwashes	31.10.23	30.10.23	103.3
22	Throat Paint, Eardrops, Nasal drops	02.11.23	03.11.23	103.3
23	Enemas, Syrups, Elixirs, Liniments and Lotions	03.11.23	06.11.23	103.3
24	Biphasic liquids: Suspensions: Definition, advantages and disadvantages	07.11.23	08.11.23	103.3
25	Classifications, Preparation of suspensions	09.11.23	10.11.23	103.3
26	Flocculated and Deflocculated suspension	10.11.23	15.11.23	103.3
27	Stability problems and methods to overcome.	15.11.23	16.11.23	103.3
28	Emulsions: Definition, classification, emulsifying agent	17.11.23	04.12.23	103.3
29	Test for the identification of type of Emulsion	05.12.23	06.12.23	103.3
30	Methods of preparation & stability problems and methods to overcome.	07.12.23	08.12.23	103.4
31	Suppositories: Definition, types, advantages	08.12.23	11.12.23	103.4
32	Disadvantages, types of bases	12.12.23	13.12.23	103.4
33	Methods of preparations	14.12.23	15.12.23	103.4
34	Displacement value & its calculations	15.12.23	18.12.23	103.4
35	Evaluation of suppositories.	19.12.23	20.12.23	103.4
36	Pharmaceutical incompatibilities: Definition	21.12.23	22.12.23	103.4
37	Classification, physical	22.12.23	08.01.24	103.4
38	Chemical and therapeutic incompatibilities with examples.	09.01.24	10.01.24	103.5
39	Semisolid dosage forms: Definitions	11.01.24	12.01.24	103.5
40	Classification, mechanisms and	12.01.24	15.01.24	103.5
41	Factors influencing dermal penetration of drugs.	16.01.24	17.01.24	103.5
42	Preparation of ointments, pastes	18.01.24	19.01.24	103.5
43	Creams and gels.	19.01.24	22.01.24	103.5
44	Excipients used in semi solid dosage forms	23.01.24	25.01.24	103.5
45	Evaluation of semi solid dosage forms	29.01.24	30.01.24	103.5

8. Tutorial Plan

Tutorial No.	Topic	Tentative date
1	Industry and organization, Pharmacy as a career	16.09.23
2	BP, USP and Extra Pharmacopoeia	23.09.23
3	Dosage forms	30.09.23
4	Powders	07.10.23
5	Parts of prescription	14.10.23
6	Errors in prescription	21.10.23
7	Posology	28.10.23
8	Pharmaceutical calculations	18.11.23
9	Liquid dosage forms	16.12.23
10	Solubility enhancement techniques	13.01.24
11	Biphasic liquids	27.01.24
12	Emulsions	03.02.24
13	Suspensions	05.02.24
14	Flocculated and Deflocculated suspension	06.02.24
15	Semisolid dosage forms	07.02.24

9. Assignments Plan:

Sr. No.	Type of Assignment	Assignment	Marks	CO	PO (Annexure I)	Tentative Date
1	Problem solving	Prescription Analysis: Identifying Errors and Suggesting Improvements	10	103.1	PO2, PO3, PO9	16.09.23
2	Subjective	Pharmaceutical Product Analysis	10	103.2	PO2, PO5, PO8	14.10.23
3	Survey based	Emulsions and Suspensions in the Pharmaceutical Market Analysis	10	103.3	PO2, PO4, PO8, PO9	18.11.23
4	Objective	Physical, Chemical and Therapeutic incompatibility	10	103.4	PO2, PO4, PO9	16.12.23
5	Subjective	Understanding and Classifying Semisolid Dosage Forms	10	103.5	PO2, PO4, PO8, PO9	12.01.24

10. Class Tests Schedule:

Sr. No.	Test Type	Topics	Marks	CO	PO (Annexure I)	Tentative Date
1	Subjective	Prescription and Posology	10	103.1	PO2, PO3, PO5, PO8, PO9	23.09.23
2	Objective	Pharmaceutical calculations	10	103.2	PO2, PO3, PO4, PO5	21.10.23
3	Objective	Monophasic liquids: Mouthwashes, Syrups Biphasic Liquids: Suspension	10	103.3	PO3, PO4, PO6, PO8, PO9	16.12.23
4	Subjective	Suppositories: types, method of preparation	10	103.4	PO2, PO4, PO5, PO8,PO9	13.01.24
5	Subjective	Semisolid dosage forms: ointments, creams and evaluation of dosage forms	10	103.5	PO4, PO5, PO8, PO9, PO10	27.01.24

11. Content Beyond Syllabus (CBS):

Sr. No.	Topics	PO to be Achieved (Annexure I)
1	Introduction to Novel Drug Delivery System	PO2, PO4, PO5, PO10
2	Evaluation Parameters of Different Formulations	PO4, PO5, PO10

12. Proposed Activity:

Sr. No.	Type of Activity	Topics	Tentative Date

1	Guest Lecture	Recent Advances in Pharmacy and Drug Development	13.11.23
2	Guest Lecture	Pharmacy Career Paths and Opportunities for Life-Long Learning	29.01.24

13. Evaluation Scheme:

The marks allocated for the continuous mode of internal assessment shall be awarded for attendance, academic activities and student-teacher interaction. Two sessional exams shall be conducted during mid of the semester. The average marks of two sessional exams shall be computed for internal assessment. The sessional exam shall be conducted for 30 marks and shall be computed for 15 marks. Weightage for various evaluation components is as below:

Sr. No.	Evaluation Component	Weightage
1	Internal Assessment 1. Continuous Mode 2. Sessional Exams	 10 15
2	End Semester Exam	75
	Total	**100**

As per PCI and University guidelines minimum 75% attendance is required to become eligible for appearing in the End Semester Examination.

This document is approved by:

Designation	Name	Signature
Course Coordinator		
HOD		
Principal		

ANNEXURE I: PROGRAM OUTCOMES

1. **Pharmacy knowledge:** Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing practices.
2. **Planning abilities:** Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
3. **Problem analysis:** Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.
4. **Modern tool usage:** Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
5. **Leadership skills:** Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
6. **Professional identity:** Understand, analyze and communicate the value of their professional roles in society (e.g., health care professionals, promoters of health, educators, managers, employers, employees).
7. **Pharmaceutical ethics:** Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
8. **Communication:** Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
9. **The pharmacist and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
10. **Environment and sustainability:** Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
11. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self-assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.