

## **COURSE HANDOUT**

### **COMPUTER APPLICATION IN PHARMACY (THEORY)**

**COURSE CODE: BP205T**

#### **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.

<b>Programme Name</b>	Bachelor of Pharmacy (B. Pharmacy)
<b>Course Name</b>	Computer Application in Pharmacy (Theory)
<b>Course Code</b>	BP205T
<b>Session</b>	
<b>Semester</b>	II
<b>Lecture/Tutorial (Per Week)</b>	3 (3-0-3)
<b>Course Credit</b>	3
<b>Course Coordinator Name</b>	

#### **1. Scope of the Course:**

This subject is designed to impart fundamental knowledge that deals with the introduction of databases, Database Management systems, computer applications in clinical studies, and the use of databases.

#### **2. Course Outcomes (COs):**

- 205.1** Acquire an understanding of number systems and information systems, foundational in computer science.
- 205.2** Develop expertise in web technologies: HTML, XML, CSS, programming languages, web servers, and databases.
- 205.3** Explain the drug information storage and retrieval, pharmacokinetics, hospital and clinical pharmacy, EP system and diagnostic system and other applications of computers in pharmacy.
- 205.4** Understand bioinformatics: objectives, databases, and impact of bioinformatics on vaccine discovery.
- 205.5** Learn computer applications in preclinical development: CDS, LIMS, and TIMS for data analysis.

#### **3. Text Books:**

- TB.1 William E. Fassett –Lea and Febiger, Computer Application in Pharmacy –600 South Washington Square, USA.
- TB.2 Sean Ekins, Wiley-Interscience, Computer Application in Pharmaceutical Research and Development –A John Willey and Sons, INC., Publication, USA
- TB.3 S.C.Rastogi, Bioinformatics (Concept, Skills and Applications), CBS Publishers and Distributors, New Delhi – 110 002 (INDIA).

#### **4. Reference Books:**

- RB.1 Cary N. Prague, Microsoft Office Access - 2003, Application Development Using VBA, SQL

**5. Other Readings & Relevant Websites:**

Sr. No.	Link of Journals, Magazines, Websites and Research Papers
1	<a href="https://www.slideshare.net/">https://www.slideshare.net/</a>
2	<a href="https://www.springer.com/">https://www.springer.com/</a>
3	<a href="https://study.com/academy/lesson/pharmacy-drug-databases-web-resources.html">https://study.com/academy/lesson/pharmacy-drug-databases-web-resources.html</a>
4	<a href="https://www.enago.com/academy/biological-databases-an-overview-and-futureperspectives/">https://www.enago.com/academy/biological-databases-an-overview-and-futureperspectives/</a>
5	<a href="https://www.intechopen.com/books/vaccines/the-impact-of-bioinformatics-on-vaccinedesign-and-development">https://www.intechopen.com/books/vaccines/the-impact-of-bioinformatics-on-vaccinedesign-and-development</a>
6	<a href="https://www.drugbank.ca/about">https://www.drugbank.ca/about</a>

**6. Course Plan:**

<b>Subject:</b> Computer Application in Pharmacy (Theory)		<b>Subject Code:</b> BP205T
Study of the awareness about Upon completion of the course the student shall be able to know the various types of application of computers in pharmacy, know the various types of databases, and know the various applications of databases in pharmacy.		
Sr. No.	Topics	No. of Lect.
<b>1</b>	<b>Unit II: Web Technologies and Databases</b> <b>Web technologies:</b> Introduction to HTML, XML, CSS and Programming languages, introduction to web servers and Server Products Introduction to databases, MYSQL, MS ACCESS, Pharmacy Drug database	6
<b>2</b>	<b>UNIT - III</b> Application of computers in Pharmacy – Drug information storage and retrieval, Pharmacokinetics, Mathematical model in Drug design, Hospital and Clinical Pharmacy, Electronic Prescribing and discharge (EP) systems, barcode medicine identification and automated dispensing of drugs, mobile technology and adherence monitoring. Diagnostic System, Lab-diagnostic System, Patient Monitoring System, Pharma Information System	8
<b>ST-I (Syllabus Covered from Lecture 01 to 14)</b>		
<b>3</b>	<b>UNIT - IV</b> Bioinformatics: Introduction, Objective of Bioinformatics, Bioinformatics Databases, Concept of Bioinformatics, Impact of Bioinformatics in Vaccine Discovery	6
<b>4</b>	<b>UNIT-V</b> Computers as data analysis in Preclinical development: Chromatographic data analysis(CDS), Laboratory Information management System (LIMS) and Text Information Management System(TIMMS)	6
<b>5</b>	<b>UNIT-I</b> Number system: Binary number system, Decimal number system, Octal number system, Hexadecimal number systems, conversion decimal to binary, binary to decimal, octal to binary etc, binary addition, binary subtraction – One’s complement ,Two’s complement method, binary multiplication, binary division. Concept of Information Systems and Software : Information gathering, requirement and feasibility analysis, data flow diagrams, process specifications, input/output design, process life cycle, planning and managing the project	4
<b>ST- II (Syllabus Covered from Lecture 15 to 30)</b>		

**7. Lecture Plan:**

Lect. No.	Topics	Tentative Date		CO
		Section-A	Section-B	
01	Introduction to Web Technologies: Basics of HTML, XML, and CSS Role of programming languages in web development	24.07.24	22.07.24	205.2
02	Sources and classification, effects, acid rain Web Servers and Server: Understanding web servers and their functions, Overview of different server products	26.07.24	23.07.24	205.2
03	Introduction to Databases, Basics of databases and their importance, Introduction to MYSQL and	31.07.24	24.07.24	205.2
04	MS ACCESS- MS Word, Excel, PPT	02.08.24	29.07.24	205.2
05	Pharmacy Drug Database: Creating and managing a drug database using databases, Implementing database queries for	07.08.24	30.07.24	205.2

	pharmaceutical data			
06	Class test-1 & Assignment-1	09.08.24	31.07.24	205.3
07	Drug information storage and retrieval systems	14.08.24	05.08.24	205.3
08	Pharmacokinetics modeling in drug design	16.08.24	06.08.24	205.3
09	Mathematical modeling in drug design- Design Expert software	21.08.24	07.08.24	205.3
10	Mathematical modeling in drug release kinetics Class Test-2 & Assignment-2	23.08.24	12.08.24	205.3
11	Hospital and clinical pharmacy applications Utilizing mobile technology for patient adherence monitoring Benefits and challenges of mobile health applications	28.08.24	13.08.24	205.3
12	Electronic Prescribing (EP) systems and their benefits Automated drug dispensing and barcode medicine identification	30.08.24	14.08.24	205.3
13	Diagnostic and Lab Systems: Introduction to diagnostic and lab systems in pharmacy Role of computers in diagnostic processes	04.09.24	19.08.24	205.3
14	Patient monitoring through computerized systems Role of information systems in pharmaceutical operations	06.09.24	20.08.24	205.3
15	Definition and scope of bioinformatics Applications of bioinformatics in pharmaceutical research	25.09.24	21.08.24	205.4
16	Understanding the objectives of bioinformatics Overview of bioinformatics databases	27.09.24	26.08.24	205.4
17	Class test-3 & Assignment-3	04.10.24	27.08.24	205.4
18	In-depth exploration of bioinformatics databases, Core concepts of bioinformatics research	09.10.24	28.08.24	205.4
19	Role of bioinformatics in vaccine development Case studies demonstrating the impact of bioinformatics in this field	11.10.24	02.09.24	205.4
20	Class Activity- Workshop-Utilization of Modern tool software in Research methodology (CBS)	16.10.24	03.09.24	205.4
21	Importance of data analysis in preclinical development, Overview of various data analysis techniques,	18.10.24	04.09.24	205.5
22	Understanding chromatographic data and its analysis,	23.10.24	23.09.24	205.5
23	Role of CDS in pharmaceutical research	25.10.24	24.09.24	205.5
24	Introduction to LIMS and its applications Implementing LIMS in a laboratory setting	30.10.24	25.09.24	205.5
25	Role of TIMS in managing textual information, Utilizing TIMS for data organization and retrieval	06.11.24	30.09.24	205.5
26	Class Test-4 & Assignment-4	08.11.24	01.10.24	205.5
27	Binary number system, Decimal number system, Octal number system, Hexadecimal number systems	13.11.24	03.10.24	205.1
28	conversion decimal to binary, binary to decimal, octal to binary etc, binary addition, binary subtraction – One's complement, Two's complement method, binary multiplication, binary division	15.11.24	04.11.24	205.1
29	Information gathering, requirement and feasibility analysis, data flow diagrams, process specifications, input/output design process life cycle, planning and managing the project	17.11.24	05.11.24	205.1
30	Class Test-5 & Assignment-5	19.11.24	06.11.24	205.1

### 8. Tutorial Plan:

Lect. No.	Topics	CO
1.	Introduction to Web Technologies: Basics of HTML, XML, and CSS Role of programming languages in web development	205.2
2.	Sources and classification, effects, acid rain Web Servers and Server: Understanding web servers and their functions, Overview of different server products	205.2
3.	Introduction to Databases, Basics of databases and their importance, Introduction to MYSQL and	205.2

4.	MS ACCESS- MS Word, Excel, PPT	205.2
5.	Pharmacy Drug Database: Creating and managing a drug database using databases, Implementing database queries for pharmaceutical data	205.2
6.	Pharmacokinetics modeling in drug design	205.3
7.	Hospital and clinical pharmacy applications Utilizing mobile technology for patient adherence monitoring Benefits and challenges of mobile health applications	205.3
8.	Patient monitoring through computerized systems Role of information systems in pharmaceutical operations	205.3
9.	Definition and scope of bioinformatics Applications of bioinformatics in pharmaceutical research	205.4
10.	Understanding chromatographic data and its analysis,	205.5
11.	Role of TIMS in managing textual information, Utilizing TIMS for data organization and retrieval	205.5
12.	Information gathering, requirement and feasibility analysis, data flow diagrams, process specifications, input/output design process life cycle, planning and managing the project	205.1
13.	conversion decimal to binary, binary to decimal, octal to binary etc, binary addition, binary subtraction – One's complement, Two's complement method, binary multiplication, binary division	205.1
14.	Information gathering, requirement and feasibility analysis, data flow diagrams, process specifications, input/output design process life cycle, planning and managing the project	205.1

### 9. Assignments Plan:

Sr. No.	Type of Assignment	Assignment	Marks	CO	PO	Tentative Date	
						Section-A	Section-B
1	Problem-solving	Solve the exercise of the number system	10	205.1	PO1-9, PO11	09.08.24	31.07.24
2	Subjective	Justify the role of each feature used in MS-word, MS-excel, and PPT with short keys (group assignment)	10	205.2	PO1, PO2, PO5, PO8, PO11	23.08.24	12.08.24
3	Mind map	Diagrammatically representation of Pharmacokinetic parameters (Group assignment)	10	205.3	PO1-9, PO11	04.10.24	27.08.24
4	Case report	Case studies demonstrating the impact of bioinformatics in this field	10	205.4	PO1-9, PO11	08.11.24	01.10.24
5	Subjective	Role of CDS in pharmaceutical research and method validation process (Group assignment)	10	205.5	PO1-9	19.11.24	06.11.24

### 10. Class Tests Plan:

Sr. No.	Test of Type	Topics	Marks	CO	PO	Tentative Date	
						Section-A	Section-B
1	Reflective writing	Concept of Information Systems and Software	10	205.1	PO 1-9,11	09.08.24	31.07.24
2	Oral presentation	Pharmacy Drug Database (reflective writing)	10	205.2	PO1, PO2, PO5, PO8, PO11	23.08.24	12.08.24
3	Reflective writing	Mathematical modeling in drug release kinetics	10	205.3	PO 1-9, PO 11	04.10.24	27.08.24
4	Oral presentation	Applications of bioinformatics in pharmaceutical research	10	205.4	PO 1-9, PO 11	08.11.24	01.10.24
5	Reflective writing	Introduction to LIMS and its applications	10	205.5	PO 1-11	19.11.24	06.11.24

### 11. Content Beyond Syllabus (CBS):

Sr. No.	Topics	PO to be Achieved
1	Utilization of Modern tool software in Research methodology	PO 1-11

### 12. Proposed Activity:

Sr. No.	Type of Activity	Topics	Tentative Date	
			Section-A	Section-B
1	Workshop	Utilization of Modern tool software in Research methodology	16.10.24	03.09.24

### 13. Evaluation Scheme:

The marks allocated for 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. 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	10
	2. Sessional Exams	15
2	End Semester Exam	50
	<b>Total</b>	<b>75</b>

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.