



**V. B. S. PURVANCHAL UNIVERSITY, JAUNPUR (UP)**  
**INSTITUTE OF PHARMACY**  
**BACHELOR OF PHARMACY (B. PHARM.)**  
**STUDY & EVALUATION SCHEME**

**Semester - 1<sup>st</sup>**

S. No.	Course code	Course Title	Type of Paper	Period			Evaluation Scheme				Sub. Total	Credit	Total Credits	Attributes					
				Per hr/week/sem			C M	SE	To tal	ES E				Empl oyabilit y	Entrep reneur ship	Skill Develo pment	Gende r Equali ty	E n S a	
				L	T	P													
<b>THEORIES</b>																			
1	BP101T	HUMAN ANATOMY & PHYSIOLOGY-1	core	3	1	0	5	15	20	80	100	4	4						
2	BP102T	PHARMACEUTICAL ANALYSIS-1	core	3	1	0	5	15	20	80	100	4	4	√	√	√			
3	BP103T	PHARMACEUTICS-1	core	3	1	0	5	15	20	80	100	4	4	√	√	√			
4	BP104T	PHARMACEUTICAL INORGONIC CHEMISTRY-1	core	3	1	0	5	15	20	80	100	4	4						
5	BP105T	COMMUNICATION SKILLS -	Core	3	0	0	5	15	20	80	100	3	3						
6	BP106RBT BP106MBT	REMEDIAL BIOLOGY/MATHEMATICS	core	3	0	0	5	15	20	80	100	3	3						
<b>PRACTICAL</b>																			
1	BP107P	HUMAN ANATOMY & PHYSIOLOGY-	Core	0	0	4	5	15	20	80	100	2	2						
2	BP108P	PHARMACEUTICAL ANALYSIS-1	Core	0	0	4	5	15	20	80	100	2	2	√	√	√			
3	BP109P	PHARMACEUTICS-1	Core	0	0	4	5	15	20	80	100	2	2	√	√	√			
4	BP110P	PHARMACEUTICAL ORGANIC CHEMISTRY-1	Core	0	0	4	5	15	20	80	100	2	2						
<b>Total</b>				<b>18</b>	<b>4</b>	<b>16</b>	<b>50</b>	<b>150</b>	<b>200</b>	<b>800</b>	<b>1000</b>	<b>30</b>	<b>30</b>						



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**Semester - II<sup>nd</sup>**

S. No.	Course code	Course Title	Type of Paper	Period			Evaluation Scheme				Sub. Total	Credit	Total Credits	Attributes				
				Per hr/week/sem			C M	SE	To tal	ES E				Emplo yabilit y	Entrep reneur ship	Skill Develo pment	Gende r Equali ty	E n S a
				L	T	P												
<b>THEORIES</b>																		
1	BP201T	HUMAN ANATOMY & PHYSIOLOGY-2	core	3	1	0	5	15	20	80	100	4	4					
2	BP202T	PHARMACEUTICAL ORGANIC CHEMISTRY –I	core	3	1	0	5	15	20	80	100	4	4				√	
3	BP203 T	BIOCHEMISTRY	core	3	1	0	5	15	20	80	100	4	4	√		√		
4	BP 204T	PATHOPHYSIOLOGY	core	3	1	0	5	15	20	80	100	4	4	√	√			
5	BP205 T	COMPUTER APPLICATIONS IN PHARMACY	core	3	0	0	5	15	20	80	100	3	3	√	√	√	√	
6	BP 206 T	ENVIRONMENTAL SCIENCES	core	3	0	0	5	15	20	80	100	3	3	√	√	√		
<b>PRACTICAL</b>																		
1	BP207P	HUMAN ANATOMY & PHYSIOLOGY-2	core	0	0	4	5	15	20	80	100	2	2	√	√	√		
2	BP208P	PHARMACEUTICAL ORGANIC CHEMISTRY -I	core	0	0	4	5	15	20	80	100	2	2				√	
3	BP 209 P	BIOCHEMISTRY	core	0	0	4	5	15	20	80	100	2	2	√	√	√	√	



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**Semester - III<sup>rd</sup>**

S. No.	Course code	Course Title	Type of Paper	Period			Evaluation Scheme				Sub. Total	Credit	Total Credits	Attributes				
				Per hr/week/sem			C M	SE	To tal	ES E				Emplo yabilit y	Entrep reneur ship	Skill Develo pment	Gende r Equali ty	E n S a
				L	T	P												
<b>THEORIES</b>																		
1	BP301T	PHARMACEUTICAL ORGANIC CHEMISTRY –II	core	3	1	0	5	15	20	80	100	4	4					
2	BP302T	PHYSICAL PHARMACEUTICS-I	core	3	1	0	5	15	20	80	100	4	4	√		√		
4	BP 303 T	PHARMACEUTICAL MICROBIOLOGY	core	3	1	0	5	15	20	80	100	4	4	√	√	√		
5	BP 304 T	PHARMACEUTICAL ENGINEERING	core	3	1	0	5	15	20	80	100	4	4	√	√	√		
<b>PRACTICAL</b>																		
1	BP305P	PHARMACEUTICAL ORGANIC CHEMISTRY -II	core	0	0	4	5	15	20	80	100	2	2					
2	BP306P	PHYSICAL PHARMACEUTICS – I	core	0	0	4	5	15	20	80	100	2	2	√		√		
3	BP 307P	PHARMACEUTICAL MICROBIOLOGY	core	0	0	4	5	15	20	80	100	2	2	√	√	√		
4	BP308P	PHARMACEUTICAL ENGINEERING	core	0	0	4	5	15	20	80	100	2	2	√	√	√		



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**Semester - IV<sup>th</sup>**

S. No.	Course code	Course Title	Type of Paper	Period			Evaluation Scheme				Sub. Total	Credit	Total Credits	Attributes				
				Per hr/week/sem			C M	SE	To tal	ES E				Emplo yabilit y	Entrep reneur ship	Skill Develo pment	Gende r Equali ty	E n S a
				L	T	P												
<b>THEORIES</b>																		
1	BP401T	PHARMACEUTICAL ORGANIC CHEMISTRY –III (Theory)	core	3	1	0	5	15	20	80	100	4	4					
2	BP402T	MEDICINAL CHEMISTRY – I	core	3	1	0	5	15	20	80	100	4	4	√	√	√		
3	BP 403 T	PHYSICAL PHARMACEUTICS-II	core	3	1	0	5	15	20	80	100	4	4	√	√	√	√	
4	BP 404 T	PHARMACOLOGY-I	core	3	1	0	5	15	20	80	100	4	4	√		√		
5	BP 405 T	PHARMACOGNOSY AND PHYTOCHEMISTRY -I (Theory)	core	3	1	0	5	15	20	80	100	4	4					
<b>PRACTICAL</b>																		
1	BP406P	MEDICINAL CHEMISTRY – I	core	0	0	4	5	15	20	80	100	2	2	√		√		
2	BP 407P	PHYSICAL PHARMACEUTICS- II	core	0	0	4	5	15	20	80	100	2	2	√		√		
3	BP 408 P	PHARMACOLOGY-I	core	0	0	4	5	15	20	80	100	2	2	√		√		
4	BP409 P	PHARMACOGNOSY AND PHYTOCHEMISTRY -I	core	0	0	4	5	15	20	80	100	2	2					
<b>Total</b>				<b>15</b>	<b>6</b>	<b>16</b>	<b>45</b>	<b>135</b>	<b>180</b>	<b>720</b>	<b>900</b>	<b>28</b>	<b>28</b>					



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**Semester - V<sup>th</sup>**

S. No.	Course code	Course Title	Type of Paper	Period			Evaluation Scheme				Sub. Total	Credit	Total Credits	Attributes				
				Per hr/week/sem			C M	SE	To tal	ES E				Emplo yability	Entrep reneur ship	Skill Develo pment	Gende r Equality	E n S a
				L	T	P												
<b>THEORIES</b>																		
1	BP501T	MEDICINAL CHEMISTRY – II	core	3	1	0	5	15	20	80	100	4	4	√		√	√	
2	BP 502 T	INDUSTRIAL PHARMACY -I	core	3	1	0	5	15	20	80	100	4	4	√	√	√	√	
3	BP503.T	PHARMACOLOGY-II	core	3	1	0	5	15	20	80	100	4	4	√	√		√	
4	BP504 T	PHARMACOGNOSY AND PHYTOCHEMISTRY -II	core	3	1	0	5	15	20	80	100	4	4					
5	BP 505 T	PHARMACEUTICAL JURISPRUDENCE	core	3	1	0	5	15	20	80	100	4	4	√		√		
<b>PRACTICAL</b>																		
1	BP 506 P	INDUSTRIAL PHARMACY -I	core	0	0	4	5	15	20	80	100	2	2	√	√	√	√	
2	BP 507 P	PHARMACOLOGY-II	core	0	0	4	5	15	20	80	100	2	2	√	√	√		
3	BP 508 P	PHARMACOGNOSY AND PHYTOCHEMISTRY-II	core	0	0	4	5	15	20	80	100	2	2					
<b>Total</b>				<b>15</b>	<b>5</b>	<b>12</b>	<b>40</b>	<b>120</b>	<b>160</b>	<b>640</b>	<b>800</b>	<b>26</b>	<b>26</b>					



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**Semester - VI<sup>th</sup>**

S. No.	Course code	Course Title	Type of Paper	Period			Evaluation Scheme				Sub. Total	Credit	Total Credits	Attributes				
				Per hr/week/sem			C M	SE	To tal	ES E				Emplo yability	Entrep reneur ship	Skill Develo pment	Gende r Equality	E n S a
				L	T	P												
<b>THEORIES</b>																		
1	BP601T	MEDICINAL CHEMISTRY – III	core	3	1	0	5	15	20	80	100	4	4	√		√	√	
2	BP602 T	PHARMACOLOGY-III	core	3	1	0	5	15	20	80	100	4	4	√	√	√	√	
3	BP603T	HERBAL DRUG TECHNOLOGY	core	3	1	0	5	15	20	80	100	4	4	√	√	√		
4	BP 604 T	BIOPHARMACEUTICS AND PHARMACOKINETICS	core	3	1	0	5	15	20	80	100	4	4	√	√	√	√	
5	BP 605 T	PHARMACEUTICAL BIOTECHNOLOGY	core	3	1	0	5	15	20	80	100	4	4	√	√	√		
6	BP606 T	QUALITY ASSURANCE	core	3	1	0	5	15	20	80	100	4	4	√	√	√		
<b>PRACTICAL</b>																		
1	BP607P	MEDICINAL CHEMISTRY- III	core	0	0	4	5	15	20	80	100	2	2	√		√		
2	BP 608 P	PHARMACOLOGY-III	core	0	0	4	5	15	20	80	100	2	2	√		√	√	
3	BP 609 P	HERBAL DRUG TECHNOLOGY	core	0	0	4	5	15	20	80	100	2	2	√	√	√		
<b>Total</b>				<b>18</b>	<b>6</b>	<b>12</b>	<b>45</b>	<b>135</b>	<b>180</b>	<b>720</b>	<b>900</b>	<b>30</b>	<b>30</b>					



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**Semester - VII<sup>th</sup>**

S. No.	Course code	Course Title	Type of Paper	Period			Evaluation Scheme				Sub. Total	Credit	Total Credits	Attributes				
				Per hr/week/sem			C M	SE	To tal	ES E				Emplo yability	Entrep reneurship	Skill Develo pment	Gende r Equality	E n S a
				L	T	P												
<b>THEORIES</b>																		
1	BP701T	INSTRUMENTAL METHODS OF ANALYSIS	core	3	1	0	5	15	20	80	100	4	4	√	√	√	√	
2	BP 702 T	INDUSTRIAL PHARMACYII	core	3	1	0	5	15	20	80	100	4	4	√	√	√	√	
3	BP 703T	PHARMACY PRACTICE	core	3	1	0	5	15	20	80	100	4	4	√	√	√	√	
4	BP 704T	NOVEL DRUG DELIVERY SYSTEMS	core	3	1	0	5	15	20	80	100	4	4	√	√	√	√	
<b>PRACTICAL</b>																		
1	BP705P	INSTRUMENTAL METHODS OF ANALYSIS	core	0	0	4	5	15	20	80	100	2	2	√	√	√	√	
2	BP706PS	PRACTICE SCHOOL	Core	0	0	12	10	30	40	160	200	6	6					
<b>Total</b>				<b>12</b>	<b>4</b>	<b>16</b>	<b>35</b>	<b>105</b>	<b>140</b>	<b>560</b>	<b>700</b>	<b>24</b>	<b>24</b>					





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**Semester - VIII<sup>th</sup>**

S. No.	Course code	Course Title	Type of Paper	Period			Evaluation Scheme				Sub. Total	Credit	Total Credits	Attributes				
				Per hr/week/sem			C M	SE	Total	ES E				Employability	Entrepreneurship	Skill Development	Gender Equality	En S a
				L	T	P												
<b>THEORIES</b>																		
1	BP801T	BIOSTATISTICS AND RESEARCH METHODOLOGY	core	3	1	0	5	15	20	80	100	4	4	√	√	√		
2	BP 802T	SOCIAL AND PREVENTIVE PHARMACY	core	3	1	0	5	15	20	80	100	4	4	√	√	√	√	
3	BP803ET	PHARMA MARKETING MANAGEMENT	ele	3 +3 =6	1 +1 =2	0+0 =0	5 + 5 =10	15 + 15 =30	20 + 20 =40	80 + 80 =160	100 + 100 =200	4+4=8	4+4=8	√	√	√		
4	BP804 ET	PHARMACEUTICAL REGULATORY SCIENCE	ele											√	√	√		
5	BP 805 ET	PHARMACOVIGILANCE	ele											√	√	√	√	
6	BP 806 ET	QUALITY CONTROL AND STANDARDIZATION OF HERBALS	ele											√	√	√		
7	BP 807 ET	COMPUTER AIDED DRUG DESIGN	ele											√	√	√		
8	BP808ET	CELL AND MOLECULAR BIOLOGY	ele											√				
9	BP809ET	COSMETIC SCIENCE	ele											√	√	√		
10	BP810 ET	EXPERIMENTAL PHARMACOLOGY	ele											√		√		
11	BP 811 ET	ADVANCED INSTRUMENTATION TECHNIQUES	ele											√	√	√		
12	BP 812 ET	DIETARY SUPPLEMENTS AND NUTRACEUTICALS	ele											√	√	√	√	





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**CO-PO MAPPING**

INSTITUTE OF PHARMACY, V.B.S. PURVANCHAL UNIVERSITY, JAUNPUR (UP)

CO-PO MAPPING

B. PHARM.

YEAR / SEMESTER: 1/I

COURSE CAT	CODE	SUBJECT	PERIODS				EVALUATION		PO								
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
BP	BP101T	Human anatomy and Physiology	3	1	0	4	15	80									
CO1	Gain knowledge of the basic structural organisation of human body; Understand the levels of organisation at cellular level ;							3	2	2	1	1	1	1			
CO2	Understand the structural and functional classification of skeletal system							3	1	2	2	2	3	3			
CO3	Learn the role of blood and lymph ; Understand the function of Lymphatic system							3	1	2	2	1	2	1			
CO4	Learn the concepts of Peripheral Nervous System and special senses							3	1	2	2	1	3	2			
CO5	Understand the structural and functional classification of Cardiovascular system							3	2	2	3	1	3	2			



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INSTITUTE OF PHARMACY, V.B.S. PURVANCHAL UNIVERSITY,  
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CO-PO MAPPING

B. PHARM.

YEAR / SEMESTER: 1 / I

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO							
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	
UG	BP102T	Pharmaceutical Analysis-I	3	1	0	4	15	80								
CO1	Understand the knowledge on preparatory pharmacy and professional way of evaluating various conventional drugs, raw materials and formulations.							3	2	3	3	1	2	1		
CO2	Explain the theoretical basis of commonly used statistical methods & correctly analyze & interpret the results of statistical data from surveys, experiments & observational studies.							3	2	3	3	1	2	1		
CO3	Illustrate sources of errors in analytical techniques, methods to minimize them.							3	2	3	3	1	2	1		
CO4	Describe the various titrimetric and electrochemical methods of analysis and their application in quality control of pharmaceuticals.							3	2	3	3	1	2	1		
CO5	Describe gravimetry and limit tests-principles and applications.							3	2	3	3	1	2	1		
CO6	Differentiate between the ability and limitations of all the methods and be able to choose a suitable method, when needed.							3	2	3	3	1	2	1		



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CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: 1/ I

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO							
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	
<b>BP</b>	<b>BP103T</b>	<b>Pharmaceutics-1</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>								
<b>CO1</b>	Know about the career opportunities in pharmacy, Pharmacopoeias and history of profession of Pharmacy in India							2	1	1	2	1	2	2		
<b>CO2</b>	About the different types of dosage form, prescription along with their parts and calculation of dose on the basis of age, body weight and body surface area.							2	1	1	2	1	2	2		
<b>CO3</b>	To understand the Pharmaceutical calculations, its different system along with methods of calculation.															
<b>CO4</b>	Describe about powders and liquid dosage forms, excipients used in formulation of liquid dosage forms and solubility enhancement techniques.							2	1	1	2	1	2	2		
<b>CO5</b>	Explain the different types of monophasic liquids formulations along with their preparation methods.							2	1	1	2	1	2	2		
<b>CO6</b>	Explain the biphasic liquids formulations, stability problems associated with these formulations and the methods to overcome these problems.							2	1	1	2	1	2	2		
<b>CO7</b>	To know about suppository, its methods of preparation, Displacement value & its calculations.							2	1	1	2	1	2	2		
<b>CO8</b>	Describe pharmaceutical incompatibilities, its type with examples.							2	1	1	2	1	2	2		
<b>CO9</b>	describe semisolid dosage forms, mechanisms and factors influencing dermal penetration of drugs, preparation of different types of semisolid dosage forms and its evaluation							2	1	1	2	1	2	2		



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**CO-PO MAPPING**

**B. PHARM. YEAR / SEMESTER: 1 / I**

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO						
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7
UG	BP104T	Pharmaceutical Inorganic Chemistry	3	1	0	4	15	80	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7
CO1	Study the monographs of inorganic drugs and pharmaceuticals.								3	2	3	3	1	2	1
CO2	Distinguish the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals.								3	2	3	3	1	2	1
CO3	Recognize the medicinal and pharmaceutical importance of inorganic compounds.								3	2	3	3	1	2	1

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**CO-PO MAPPING**

**B. PHARM. YEAR / SEMESTER: 1 / 1**

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO						
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7
BP	BP105T	Communication Skills	3	1	0	3	15	80	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7
CO1	Students will learn basic concepts/ knowledge of Communication process, its types, Barriers to communication and Perspectives in communication								0	2	2	2	2	3	2
CO2	Students will learn Elements of communication: Tone, body language, gesture, communication styles, Verbal and Non-verbal mode of communication								0	0	0	0	3	3	3
CO3	Students will learn about Basic Listening skills: active listening, listening in difficult situations, Written communication: shades of meaning, complexity of topic, Audience factor, organization of the message								0	0	2	2	2	1	1



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**CO-PO MAPPING**

**B PHARM**

**YEAR / SEMESTER : 1 / I**

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO							
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	
<b>BP</b>	<b>BP106RBT</b>	<b>REMEDIAL BIOLOGY</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>15</b>	<b>80</b>								
<b>CO1</b>	Students will be able to learn about basic concept/ Knowledge of animal cell, Animal Tissue, cell division and cell organelles'								3	3	2	3	3	2	3	
<b>CO2</b>	Students will be able to learn about basic concept/ Knowledge of plant respiration, plant growth and development, plant and mineral nutrition, photosynthesis								2	2	3	2	2	3	2	
<b>CO3</b>	Students will be able to learn about classifications & salient feature of five kingdoms of life Anatomy and Physiology human, anatomy and physiology of plant								3	3	2	3	2	1	2	
<b>CO4</b>	Students will be able to learn about circulatory, digestive, respiratory and excretory system of human								3	2	2	2	2	2	2	
<b>CO5</b>	Students will be able to learn about Morphology of plant, Root, Stem, Leaf and its modification								3	2	2	2	2	2	3	





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CO-PO MAPPING

B. PHARM.

YEAR / SEMESTER : 1 / II

COURSE CATEGO RY	CODE	SUBJECT	PERIODS				EVALUATION		PO							
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	
<b>BP</b>	<b>BP201T</b>	<b>HUMAN ANATOMY AND PHYSIOLOGY-II</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>								
<b>CO1</b>	The chief objective of the unit was to provide basic knowledge about the ANATOMY AND PHYSIOLOGY OF NERVOUS SYSTEM							2	3	3	3	2	2	3		
<b>CO2</b>	This subject is designed to impart basic knowledge about the anatomy and physiology of gastrointestinal system and its accessory organ.							3	3	2	3	2	3	3		
<b>CO3</b>	The chief objective of this unit is to provide basic knowledge of functioning of respiratory system and urinary system.							3	3	3	2	2	3	3		
<b>CO4</b>	1. This subject is designed to impart basic knowledge on the area of endocrinology. To study the anatomy and physiology of various endocrine glands							3	3	3	2	3	3	3		
<b>CO5</b>	The chief objective of the unit was to provide basic knowledge of anatomy and physiology of male and female reproductive system							3	3	3	2	2	3	3		





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B. PHARM.

YEAR / SEMESTER: I / II

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO						
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7
BP	BP202T	Pharmaceutical Organic Chemistry –I (Theory)	3	1	0	4	15	80	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7
CO1	Recognise the classification, nomenclature and structural isomerism in organic compounds.							3	3	3	1	1	3	3	
CO2	Account the preparation and reactions of alkanes, alkenes and conjugated dienes.							3	3	3	1	1	3	3	
CO3	Explore the methods of synthesis, reactions and uses of alkyl halides and alcohols.							3	3	3	1	1	3	3	
CO4	Investigate the synthetic routes, nucleophilic addition reactions, qualitative tests utilized for carbonyl compounds.							3	3	3	1	1	3	3	
CO5	Evaluate the preparation, effect of substituents on reactivity, structure and uses of carboxylic acids & aliphatic amines.							3	3	3	1	1	3	3	

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B. PHARM.

YEAR / SEMESTER: I / II

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO						
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7
BP	BP203T	Biochemistry	3	1	0	4	15	80	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7
CO1	Understand the importance of metabolism of substrates and their bioregulation							3	2	3	3	1	1	1	
CO2	Will acquire chemistry and biological importance of biological macromolecules							3	2	3	3	1	1	1	
CO3	Acquainted with qualitative and quantitative estimation of the biological macromolecules							3	2	3	3	1	1	1	



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**B. PHARM. YEAR / SEMESTER: I / II**

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO						
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7
<b>BP</b>	<b>BP204T</b>	<b>Pathophysiology</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>	<b>PO-1</b>	<b>PO-2</b>	<b>PO-3</b>	<b>PO-4</b>	<b>PO-5</b>	<b>PO-6</b>	<b>PO-7</b>
<b>CO1</b>	Basic principles of cell injury, adaptation along with basic mechanism involved in the process of inflammation and repair							3	0	0	0	0	0	0	
<b>CO2</b>	Students will be demonstrated with a basic understanding of the concepts and elements and will learn also learn about various diseases of the cardiovascular system							3	0	0	0	0	0	0	
<b>CO3</b>	Students will understand the mechanisms, the diagnosis, and the treatment of diseases of the haematological and endocrine system and they will understand the mechanisms, the diagnosis, and the treatment of diseases of the nervous and gastrointestinal system							3	0	0	0	0	0	0	
<b>CO4</b>	Students will develop basic understanding of the concepts and elements of inflammatory and liver disease. They will develop a basic understanding of cancer and the disease of bones and joints.							3	0	0	0	0	0	0	
<b>CO5</b>	Students will learn about different infectious diseases and they will get preliminary information about the sexually transmitted disease							3	0	0	0	0	0	0	



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**B. PHARM. YEAR / SEMESTER: I / II**

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO							
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	
<b>BP</b>	<b>BP205T</b>	<b>COMPUTER APPLICATIONS IN PHARMACY</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>15</b>	<b>80</b>								
<b>CO1</b>	Understanding various types number systems.							3	2	2	1	0	2	0		
<b>CO2</b>	Understanding various types of databases.							2	0	3	0	1	0	3		
<b>CO3</b>	Understanding various types of application of computers in pharmacy.							1	1	0	0	3	3	0		
<b>CO4</b>	Understanding Bioinformatics and databases and impact of Bioinformatics in Vaccine Discovery.							2	2	0	3	2	0	3		
<b>CO5</b>	Understanding Computers as data analysis in Preclinical development.							2	0	3	0	3	0	3		

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**B. PHARM. YEAR / SEMESTER: I / II**

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO							
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	
<b>BP</b>	<b>BP206T</b>	<b>ENVIRONMENTAL SCIENCES</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>15</b>	<b>80</b>								
<b>CO1</b>	Awareness about environmental problems							3	2	2	1	0	2	0		
<b>CO2</b>	Develop an attitude of concern for the environment							2	0	3	2	1	0	3		
<b>CO3</b>	Acquire skill to help the concern individuals in identifying and solving environmental problems							3	1	0	3	3	3	0		



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B. PHARM.

YEAR / SEMESTER: 2/III

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO						
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7
BP	BP301T	Pharmaceutical Organic Chemistry II	3	1	0	4	15	80	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7
CO1	Understand the concept of aromaticity, structure and general reactions of Benzene.							3	3	3	2	3	2	2	
CO2	recognize different reactions given by different acidic and basic aromatic compounds							3	3	3	2	3	3	2	
CO3	Learn about lipids, their types and different analytical constants to find the quality of lipids.							3	3	3	2	3	3	2	
CO4	Learn about polynuclear hydrocarbons, their reactions and structure elucidation							3	3	3	3	3	2	2	
CO5	Learn about cycloalkanes and different theories for the stabilities of cycloalkanes							3	3	3	2	3	2	2	



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**YEAR / SEMESTER: 2/III**

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO							
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	
<b>BP</b>	<b>BP302T</b>	<b>Physical Pharmaceutics-1</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>								
<b>CO1</b>	understand the mechanisms of solute solvent interactions, different factors which improve solubility of drugs and diffusion principles in biological systems.								3	1	1	2	0	0	1	
<b>CO2</b>	Know about solubility of gas in liquids, solubility of liquid in liquids, Raoult's law, Distribution law and different types of liquids.								3	1	1	2	0	0	1	
<b>CO3</b>	understand states of matter and properties of matter, eutectic mixtures and different forms of solids.															
<b>CO4</b>	Explain various physicochemical properties of drug molecules in designing the dosage forms.								3	1	1	2	0	0	1	
<b>CO5</b>	to know about surface tension, differentiate between surface and interfacial tension and how to measure surface and interfacial tension by different methods.								3	1	1	2	0	0	1	
<b>CO6</b>	Explain surface active agents, HLB Scale and adsorption at solid interface.								3	1	1	2	0	0	1	
<b>CO7</b>	know about complexation, different types of complexation, and their methods of analysis.								3	1	1	2	1	0	1	
<b>CO8</b>	Describe protein binding and how protein binding effect on drug action and crystalline structures of complexes.								3	1	1	2	1	0	1	
<b>CO9</b>	describe pH scale given by Sorensen, its determination methods, buffer isotonic solutions, purpose behind maintaining the isotonicity of drug solution, and buffers in pharmaceutical and biological systems.								3	1	1	2	1	0	1	



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**YEAR / SEMESTER: 2/III**

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO							
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	
<b>BP</b>	<b>BP303T</b>	<b>Pharmaceutical Microbiology</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>								
<b>CO1</b>	The students should understand the methods of identification, cultivation and preservation of various microorganisms.							3	1	2	2	1	1	2		
<b>CO2</b>	The students should understand about Staining, sterilization and Evaluation of the efficiency of sterilization methods.							3	2	2	3	1	2	2		
<b>CO3</b>	To understand about disinfectants, and their evaluation, sterility testing methods of pharmaceutical products.							3	2	2	3	1	2	2		
<b>CO4</b>	The students should understand about aseptic area, sources of contamination, clean area classification and microbiological standardization methods of Pharmaceuticals.							3	2	2	3	1	2	2		
<b>CO5</b>	The students should understand the microbial spoilage of pharmaceutical products, Preservation of pharmaceutical products, cell culture technology and its applications in pharmaceutical industries.							3	1	1	2	1	2	2		







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CO-PO MAPPING

B. PHARM.

YEAR / SEMESTER: 2/IV

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO								
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
BP	BP401T	Pharmaceutical Organic Chemistry III – Theory	3	1	0	4	15	80									
CO1	Understand the concept of stereoisomerism especially optical isomerism.							3	3	3	2	2	2	3	2		
CO2	Understand the concept of geometrical isomerism							3	3	2	2	3	2	3	3		
CO3	Learn about nomenclature, classification and chemical reactions of heterocyclic compounds.							2	2	3	3	3	3	2	2		
CO4	Understand different reactions and medicinal uses of larger heterocyclic compounds							3	2	3	2	3	2	3	2		
CO5	Learn the concept of reduction, oxidation, rearrangement reactions and their applications							3	3	2	2	3	2	3	2		

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B. PHARM.

YEAR / SEMESTER: 2/IV

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO								
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
BP	BP 402T	Medicinal Chemistry-I	3	1	0	4	15	80									
CO1	Understand basic concept of medicinal chemistry, physicochemical properties and drug metabolism.							1	1	1	2	2	2	2	0		
CO2	Well acquainted with the chemistry of cholinergic and anti-cholinergic drugs.							2	0	1	2	1	1	2	0		
CO3	To understand chemistry of drugs acting on autonomic nervous system							1	1	2	2	1	1	2	0		



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**B. PHARM.**

**YEAR / SEMESTER: 2/IV**

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO								
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
<b>BP</b>	<b>BP 403T</b>	<b>Physical Pharmaceutics-II</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>									
<b>CO1</b>	Understand various physicochemical properties of drug molecules in the designing the dosage form							3	2	2	2	2	3	2	1		
<b>CO2</b>	Understand the concept of viscosity and flow behaviour in the formulation development and evaluation of dosage forms.							3	2	2	2	2	3	2	1		
<b>CO3</b>	Knowledge of physicochemical properties, formulation factors and instability markers in development of biphasic liquid dosages forms.							3	2	2	2	2	3	2	1		
<b>CO4</b>	Demonstrate the application of particle size in designing the dosages forms.							3	2	2	2	2	3	2	1		
<b>CO5</b>	1.Know the principles of chemical kinetics & to use them in assigning expiry date for Formulation							3	2	2	2	2	3	2	1		

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**B. PHARM.**

**YEAR / SEMESTER: 2/IV**

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO								
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
<b>BP</b>	<b>BP 404T</b>	<b>Pharmacology-I</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>									
<b>CO1</b>	Understand the pharmacological actions of different categories of drugs							3	2	3	3	2	3	2	2		
<b>CO2</b>	Explain the mechanism of drug action at organ system/sub cellular/macromolecular levels							3	2	3	3	2	2	1	3		



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**B. PHARM.**

**YEAR / SEMESTER: 2/IV**

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO								
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
<b>BP</b>	<b>BP 405T</b>	<b>Pharmacognosy and Phytochemistry -I</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>									
<b>CO1</b>	Gain knowledge on biological source, active constituents and uses of crude drugs							3	2	2	1	1	0	0	0		
	Understand the techniques of evaluation of crude drugs as per the WHO guidelines							3	0	2	2	2	3	3	0		
<b>CO2</b>	Understand the basic principles of cultivation, collection and storage of crude drugs							3	0	2	2	0	0	1	1		
	Application of the crop improvement concepts involved in techniques for improvement of quality of medicinal plants							3	1	2	2	0	3	2	1		
<b>CO3</b>	Exploring the tissue culture technique in medicinal plants							3	2	2	3	0	3	2	1		
<b>CO4</b>	Appreciate the applications of Primary & Secondary metabolites of the plant and explore its medicinal importance based on its chemical class							2	0	3	2	1	0	0	1		
	Understand the principles and application of different system of alternative medicine							3	0	2	1	1	0	0	2		
<b>CO5</b>	Explore novel medicinal agents from different sources of natural origin							3	1	2	0	0	1	0	1		



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B. PHARM.

YEAR / SEMESTER: 3 / V

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO								
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
BP	BP501T	MEDICINAL CHEMISTRY- II	3	1	0	4	15	80									
CO1	Know the types of biological targets in humans and the structural requirement of drugs interacting with them and comprehend & correlate the biological systems involved in drug action for drugs acting as Antihistamines, Gastric Proton pump inhibitors, Antineoplastics, Diuretics, CVS drugs, Steroids, Thyroids and antithyroids, Antidiabetics and Local Anesthetics.								3	2	3	2	3	3	1	1	
CO2	Explain chemical interactions of endogenous molecules with specific receptors or enzymes and the molecular effects of their respective agonists and antagonists through Structure Activity relationship studies of drugs for the following category of drugs Antihistamines, Gastric Proton pump inhibitors, Antineoplastics, Diuretics, CVS drugs, Steroids, Thyroids and antithyroids, Antidiabetics and Local Anesthetics.								3	2	3	3	3	2	2	3	
CO3	Justify the absorption, distribution and selectivity of drugs based on chemical structure for the following category of drugs Antihistamines, Gastric Proton pump inhibitors, Antineoplastics, Diuretics, CVS, Steroids, Thyroids and antithyroids, Antidiabetics and Local Anesthetics.								3	2	3	3	3	2	2	3	
CO4	Predict the drug metabolic pathways, adverse effect and therapeutic value from the structure of drugs and provide information on the storage of drugs based on the chemical stability. Antihistamines, Gastric Proton pump inhibitors, Antineoplastics, Diuretics, CVS, Steroids, Thyroids and antithyroids, Antidiabetics and Local Anesthetics.								3	2	3	3	3	2	2	3	
CO5	Demonstrate knowledge of chemical synthesis of important drugs such as Cimetidine, Mechlorethamine, Mercaptopurine, Methotrexate, Acetazolamide, Chlorothiazide, Furosemide, Methyl dopa, Nitroglycerin, Isosorbide, Disopyramide, Warfarin, Tolbutamide, Benzocaine, Procaine and Dibucaine.								3	2	3	3	1	1	3	1	



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**B. PHARM.**

**YEAR / SEMESTER: 3 / V**

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO							
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8
BP	BP502T	Industrial Pharmacy-I	3	1	0	4	15	80	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8
CO1	Acquire the knowledge of Preformulation							3	3	2	2	1	3	3	2	
CO2	Know the various pharmaceutical dosage forms and their manufacturing techniques.							3	3	2	2	3	2	3	2	
CO3	Know various considerations in development of pharmaceutical dosage forms.							3	3	2	2	2	3	3	3	
CO4	Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality.							3	3	3	2	3	2	2	2	

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**YEAR / SEMESTER: 3 / V**

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO							
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8
BP	BP 503T	PHARMACOLOGY-II	3	1	0	4	15	80	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8
CO1	Discuss & Interpret about the application of various blood forming agents and their role in treatment of cardiovascular disorders. Further able to analyze the importance of Diuretics in certain CVDs.							3	3	3	2	2	3	2	1	
CO2	Explain about the mechanism of drug action and its relevance in the treatment of different diseases.							3	3	3	3	2	3	2	2	
CO3	Apply their knowledge to understand and describe about how Autocoids involved in development of inflammatory disorders like Gout and Arthritis and their treatment.							3	3	2	3	1	2	2		



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			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
<b>BP</b>	<b>BP 504T</b>	<b>Pharmacognosy and Phytochemistry II</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>									
<b>CO1</b>	Discuss the general technique of biosynthesis of phytoconstituents in plants.							2	3	3	3	1	2	2	2		
<b>CO2</b>	Apprehended the composition, chemistry & chemical classes, bio-sources, therapeutic uses and commercial applications of different plants secondary metabolites.							3	2	3	3	2	3	2	2		
<b>CO3</b>	Accomplished in the Isolation, Identification and Analysis of Phytoconstituents.							3	3	2	2	2	2	3	2		
<b>CO4</b>	Accomplished in the production estimation and utilization of phytoconstituents in industrial scale							2	2	3	3	1	2	2	3		
<b>CO5</b>	Accomplished in the estimation and analysis of the different phytoconstituents with help of instrument based on chromatography and spectroscopy.							3	3	3	3	2	3	2	2		

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			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
<b>BP</b>	<b>BP505T</b>	<b>Pharmaceutical Jurisprudence</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>									
<b>CO1</b>	Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals							3	1	3	3	0	2	3	1		
<b>CO2</b>	Various Indian Pharmaceutical Laws							2	2	1	3	0	3	3	0		



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			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8
<b>BP</b>	<b>BP601T</b>	<b>MEDICINAL CHEMISTRY- III</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>								
<b>CO1</b>	Know the types of biological targets in humans and the structural requirement of drugs interacting with them and comprehend and correlate the biological systems involved in drug action for drugs acting as Antibiotics, Anti-infective – Antibacterial, Antiprotozoals, Antivirals, Antifungals and Anthelmintics							3	2	3	2	3	3	1	1	
<b>CO2</b>	Explain chemical interactions of endogenous molecules with specific receptors or enzymes and the molecular effects of their respective agonists and antagonists through Structure Activity relationship studies of drugs for the following category of drugs Antibiotics, Anti-infective – Antibacterial, Antiprotozoals, Antivirals, Antifungals and Anthelmintics							3	2	3	3	3	2	2	3	
<b>CO3</b>	Justify the absorption, distribution and selectivity of drugs based on chemical structure – Antibiotics, Anti-infective – Antibacterial, Antiprotozoals, Antivirals, Antifungals and Anthelmintics							3	2	3	3	3	2	2	3	
<b>CO4</b>	Predict the drug metabolic pathways, adverse effect and therapeutic value from the structure of drugs and provide information on the storage of drugs based on the chemical stability.							3	2	3	3	3	2	2	3	
<b>CO5</b>	Demonstrate knowledge of chemical synthesis of important drugs such as Chloramphenicol, Chloroquine, Pamaquine, Isoniazid, Para amino salicylic acid, Ciprofloxacin, Nitrofurantoin, Acyclovir, Miconazole, Metronidazole, Diethylcarbamazine, Mebendazole, Sulfacetamide, Sulfamethoxazole, Dapsone.							3	2	3	3	1	1	3	1	
<b>CO6</b>	Explain physico chemical properties related to QSAR and Describe various approaches and designing of drug molecules including prodrug and Combinatorial chemistry							3	1	3	3	3	1	3	1	







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			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
<b>BP</b>	<b>BP 603T</b>	<b>Herbal Drug Technology</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>									
<b>CO1</b>	Discuss the crude drug raw material as source of herbal drugs by cultivation process and knowledge of traditional system of medicine.							2	1	3	2	1	2	1	1		
<b>CO2</b>	Apprehended the role of Nutraceuticals in treatment of various disease and Herbal-Drug and Herb-Food Interactions.							3	1	3	3	2	3	2	2		
<b>CO3</b>	Apprehended the role of natural excipients in Herbal formulations and cosmetics.							2	2	2	2	2	2	3	2		
<b>CO4</b>	Accomplished the Patenting aspects, Regulatory Issues and WHO and ICH guidelines for evaluation and assessment of Traditional drugs and Natural Products.							2	2	3	3	1	2	2	3		
<b>CO5</b>	Discuss the General Introduction to Herbal Industry and Good Manufacturing Practice of Indian systems of medicine.							3	2	3	3	2	3	1	2		



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			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8
BP	BP604T	Biopharmaceutics & Pharmacokinetics	3	1	0	4	15	80	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8
CO1	to understand the mechanisms of drug absorption through GIT, factors influencing drug absorption through GIT and absorption of drug from non per oral extra-vascular routes.							3	1	1	2	1	2	2	2	
CO2	Know about the tissue permeability of drugs, kinetics of protein binding and clinical significance of protein binding of drugs.							3	1	1	2	1	2	2	2	
CO3	understand the basic understanding of metabolic pathways, factors affecting renal excretion of drugs and non renal routes of drug excretion of drugs.							3	1	1	2	1	2	2	2	
CO4	Know about the absolute and relative bioavailability, in-vitro drug dissolution models, in-vitro-in-vivo correlations, bioequivalence studies and methods to enhance the dissolution rates and bioavailability of poorly soluble drugs.							3	1	1	2	1	2	2	2	
CO5	explain compartmental modeling, various pharmacokinetic parameters, their significance and applications.							3	1	1	2	1	2	2	2	
CO6	know about kinetics of multiple dosing, calculations of loading and maintenance doses and their significance.							3	1	1	2	1	2	2	2	
CO7	understand the concept of non-linear pharmacokinetics and factors causing non-linearity and Michaelis-menton method of estimating parameters.							3	1	1	2	1	2	2	2	



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			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8
BP	BP 605T	Pharmaceutical Biotechnology	3	1	0	4	15	80	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8
CO1	Understanding the basics of biotechnology including genetic engineering, Protein Engineering and Production of Enzymes, enzymes immobilization and biosensors.							3	1	1	3	1	2	2	1	
CO2	Understanding Genetic engineering, Study of Recombinant DNA technology, PCR and production of biotechnological products.							3	2	2	3	1	2	2	1	
CO3	Understanding the immune system, Hypersensitivity reactions, Monoclonal antibodies and vaccines.							3	2	2	3	1	2	2	1	
CO4	Know the importance of various immunological techniques i.e. Microbial genetics, Microbial biotransformation and Mutation.							3	1	1	2	1	1	2	1	
CO5	Study of fermentation technology, production of various pharmaceutical products and Collection, Processing and Storage of Blood Products.							3	2	1	3	2	2	2	2	

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COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO							
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8
BP	BP606T	QUALITY ASSURANCE	3	1	0	4	15	80	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8
CO1	Understand the cGMP aspects in Pharmaceutical industry.							3	3	2	2	3	3	3	2	



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COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO								
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
<b>BP</b>	<b>BP701T</b>	<b>Instrumental Methods of Analysis</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>									
<b>CO1</b>	Investigate the pharmaceutical substances by UV Visible and fluorescence spectroscopy .							3	3	3	3	1	2	3	3		
<b>CO2</b>	Analyze the essentials of nepheloturbidometry, flame photometry and atomic absorption spectroscopy.							3	3	3	3	1	2	3	3		
<b>CO3</b>	Apprehend the analysis of a pharmaceutical substances by chromatographic techniques and electrophoresis.							3	3	3	3	1	2	3	3		
<b>CO4</b>	Recognize the principle, instrumentation and applications of gas chromatography & high performance liquid chromatography.							3	3	3	3	1	2	3	3		
<b>CO5</b>	Deal with the fundamentals of ion exchange, affinity chromatography and gel chromatography.							3	3	3	3	1	2	3	3		

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COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO								
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
<b>BP</b>	<b>BP702T</b>	<b>Industrial Pharmacy-II</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>									
<b>CO1</b>	Acquire the ability about process of pilot plant and scale up of pharmaceutical dosage forms							3	3	3	2	3	3	3	2		
<b>CO2</b>	Able to communicate the process of technology transfer from lab scale to commercial batch							3	3	3	2	3	2	2	2		
<b>CO3</b>	Know the different Laws and Acts that regulate pharmaceutical industry							3	3	3	2	3	3	3	3		



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			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
<b>BP</b>	<b>703T</b>	<b>Pharmacy Practice</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>									
<b>CO1</b>	Know and understand the Hospital organization and detect and assess adverse drug reactions, reporting and its management.							3	3	2	2	2	2	1	2		
<b>CO2</b>	Knowledge of various drug distribution methods system in the hospital, and monitor drug therapy of Patient, role pharmacist in medication adherence and community pharmacy management .also know how to obtain medication history interview							3	3	3	2	2	2	1	0		
<b>CO3</b>								3	3	3	2	2	2	1	2		
<b>CO4</b>	Able to understand the medication of management, budget preparation and its implementation, and also help in rational use of common over the counter medication							3	2	2	2	2	2	1	2		
<b>CO5</b>	Able to understand the appreciate pharmacy stores and inventory control management and able to interpret selected laboratory results of specific disease states and controlling of investigational use of drugs.							3	3	3	2	2	2	3	2		



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			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8
BP	BP704T	Novel Drug Delivery Systems	3	1	0	4	15	80	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8
CO1	Understand various approaches for development of novel drug delivery systems. 2. Know the criteria for selection of drugs and polymers for the development of novel drug delivery systems, their formulation and evaluation.							3	2	2	2	2	3	2	1	
CO2	Know the approaches, technologies and drug carriers used in the process of drug delivery which serves to improve the selectivity, effectiveness, and/or safety of drug administration.							3	2	2	2	2	3	2	1	
CO3	The students should understand about Transdermal Drug Delivery Systems, Gastro-retentive drug delivery systems and Naso-pulmonary drug delivery system.							3	2	2	2	1	1	2	1	
CO4	To understand Targeted Drug Delivery including liposomes, niosomes, nanoparticles, monoclonal antibodies.							3	1	1	3	1	1	2	1	
CO5	To understand Ocular Drug Delivery Systems and Intrauterine Drug Delivery Systems including intra uterine devices (IUDs).							3	2	1	3	2	1	2	2	





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COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO								
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
<b>BP</b>	<b>BP 801T</b>	<b>Biostatistics and Research Methodology</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>									
<b>CO1</b>	Discuss the applications of Biostatics such as Correlation, Mean, Median, Mode, Range and standard deviation.							1	1	3	1	1	2	0	0		
<b>CO2</b>	Discuss the applications of Biostatics in Pharmacy such as Regression, Probability theory, Sampling technique, Parametric tests and Non Parametric tests							1	1	3	1	1	1	1	0		
<b>CO3</b>	Apprehended the design of experiments for Phases of clinical trials and observational and experimental studies.							1	2	2	1	0	2	1	0		
<b>CO4</b>	Accomplished the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of experiment).							1	2	3	3	1	2	0	0		
<b>CO5</b>	Accomplished the statistical techniques in Design and Analysis of experiments.							1	2	3	2	0	1	1	0		

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			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
<b>BP</b>	<b>BP802T</b>	<b>Social and Preventive Pharmacy</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>									
<b>CO1</b>	Able to know about disease, health and health education and acquire the knowledge of nutrition and hygiene.							3	3	2	2	3	3	3	2		



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			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
UG	BP 803ET	Pharmaceutical Marketing Management	3	1	0	4	15	80									
CO1	The pharmaceutical industry, requires skilled managers who can take the industry forward by managing and taking the complex decisions which are imperative for the growth of the industry.							1	3	3	2	3	3	3	3		
CO2	The Knowledge and Know-how of marketing management groom the people for taking a challenging role in Sales and Product management.							1	3	3	2	3	3	3	3		
CO3	The course aims to provide an understanding of marketing concepts and techniques and their applications in the pharmaceutical industry.							1	3	3	2	3	3	3	3		



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			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
<b>MPH</b>	<b>BP-804ET</b>	<b>PHARMACEUTICAL REGULATORY SCIENCE</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>									
<b>CO1</b>	Understand the concepts of innovator and generic drugs, drug development process.							3	2	2	2	2	3	2	1		
<b>CO2</b>	Know the regulatory guidance's and guidelines for filing and approval process, preparation of dossiers and their submission to regulatory agencies in different countries							3	2	2	2	2	3	2	1		
<b>CO3</b>	Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals and the submission of global documents in CTD/ eCTD, ASEAN formats.							3	2	2	2	2	3	2	1		
<b>CO4</b>	Understand the clinical trials requirements for approvals for conducting clinical trials, pharmacovigilance and process of monitoring in clinical trials							3	2	2	2	2	3	2	1		
<b>CO5</b>	Knowledge of basic terminology, regulatory guidance's, guidelines, laws and acts.							3	2	2	2	2	3	2	1		



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			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
<b>BP</b>	<b>BP 805ET</b>	<b>PHARMACOVIGILANCE</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>									
<b>CO1</b>	Understanding History and development of pharmacovigilance							3	0	1	1	1	2	2	1		
<b>CO2</b>	Knowledge of National and International scenario of pharmacovigilance							3	2	3	1	1	2	0	3		
<b>CO3</b>	Being relevant to dictionaries, coding and terminologies used in pharmacovigilance							3	3	2	3	1	2	0	3		
<b>CO4</b>	Detection of new adverse drug reactions and their assessment							2	2	3	1	1	2	0	2		
<b>CO5</b>	Understanding International standards for classification of diseases and drugs							3	3	3	1	1	2	2	3		



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**STUDY & EVALUATION SCHEME**

INSTITUTE OF PHARMACY, V.B.S. PURVANCHAL UNIVERSITY,  
 JAUNPUR (UP)

CO-PO MAPPING

B. PHARM.

YEAR / SEMESTER: 4 / VIII

COURSE CATEGO RY	CODE	SUBJECT	PERIODS				EVALUATION		PO								
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
<b>BP</b>	<b>BP806ET</b>	<b>Quality Control and Standardization of Herbals</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>									
<b>CO1</b>	Gain knowledge on biological source, active constituents and uses of crude drugs						3	2	2	1	1	0	0	0			
	Understand the techniques of evaluation of crude drugs as per the WHO guidelines						3	0	2	2	2	3	3	0			
<b>CO2</b>	Understand the basic principles of cultivation, collection and storage of crude drugs						3	0	2	2	0	0	1	1			
	Application of the crop improvement concepts involved in techniques for improvement of quality of medicinal plants						3	1	2	2	0	3	2	1			
<b>CO3</b>	Exploring the tissue culture technique in medicinal plants						3	2	2	3	0	3	2	1			
<b>CO4</b>	Appreciate the applications of Primary & Secondary metabolites of the plant and explore its medicinal importance based on its chemical class						2	0	3	2	1	0	0	1			
	Understand the principles and application of different system of alternative medicine						3	0	2	1	1	0	0	2			
<b>CO5</b>	Explore novel medicinal agents from different sources of natural origin						3	1	2	0	0	1	0	1			



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CO-PO MAPPING

B. PHARM.

YEAR / SEMESTER: 4 / VIII

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO								
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
BP	BP807ET	Computer Aided Drug Design	3	1	0	4	15	80									
CO1	Understand the process of Design and discovery of lead molecules							3	2	3	3	2	2	3	3		
CO2	Appreciate the role of drug design in drug discovery process							3	2	3	3	2	2	3	3		
CO3	Understand and apply the concept of QSAR and docking							3	2	3	3	2	2	3	3		
CO4	Apply various strategies to develop new drug like molecules							3	2	3	3	2	2	3	3		
CO5	Understand the designing of new drug molecules using molecular modeling software							3	2	3	3	2	2	3	3		
CO6	Appreciate importance of computational methods in drug design and discovery processes							3	2	3	3	2	2	3	3		

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B. PHARM.

YEAR / SEMESTER: IV / VIII

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO								
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
BP	BP808ET	Cell and Molecular Biology	3	1	0	4	15	80									
CO1	Understanding the history of cell and molecular biology, cellular functioning and composition and chemical foundations of cell biology.							3	1	1	3	1	2	2	1		
CO2	Understanding about DNA and RNA and their functioning							3	2	2	3	1	2	2	1		



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CO-PO MAPPING

B. PHARM.

YEAR / SEMESTER: IV/VIII

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO								
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
BP	BP809ET	Cosmetic Science	3	1	0	4	15	80									
CO1	Gain information on key ingredients used in cosmetics and cosmeceuticals							1	1	0	0	0	3	0	0		
CO2	Understand key building blocks of cosmetics for various formulations							1	1	0	0	0	3	0	0		
CO3	Know the current technologies in the market							1	1	0	0	0	3	0	0		
CO4	Understand the scientific principles to develop cosmetics and cosmeceuticals with desired safety							1	1	0	0	0	3	0	0		

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B. PHARM.

YEAR / SEMESTER: 4 / VIII

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO								
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	
BP	BP810ET	Experimental Pharmacology	3	1	0	4	15	80									
CO1	Appreciate the knowledge gained on preclinical evaluation of drugs and recent experimental techniques in the drug discovery and development.							3	3	1	2	0	1	3	1		
CO2	Understood the various of laboratory animals and their maintenance as per the guidelines and also describe good laboratory practices in maintenance and handling of experimental animals																



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**B. PHARM.**

**YEAR / SEMESTER: IV / VIII**

COURSE CATEGO RY	CODE	SUBJECT	PERIODS				EVALUATION		PO							
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	
<b>BP</b>	<b>BP811ET</b>	<b>Advanced Instrumentation Techniques</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>								
<b>CO1</b>	Investigate the pharmaceutical substances by NMR spectroscopy and mass spectrometry.							3	3	3	3	1	2	3		
<b>CO2</b>	Analyze the essentials of thermal methods of analysis and X ray diffraction methods.							3	3	3	3	1	2	3		
<b>CO3</b>	Apprehend the calibration and validation of analytical instruments.							3	3	3	3	1	2	3		
<b>CO4</b>	Recognize the fundamentals of radio immune assay and extraction techniques.							3	3	3	3	1	2	3		
<b>CO5</b>	Deal with the fundamentals of hyphenated techniques.							3	3	3	3	1	2	3		





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**YEAR / SEMESTER: 4 / VIII**

COURSE CATEGORY	CODE	SUBJECT	PERIODS				EVALUATION		PO							
			L	T	P	C	S	ESE	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	
<b>BP</b>	<b>BP812ET</b>	<b>Dietary Supplements and Nutraceuticals</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>80</b>								
<b>CO1</b>	Understand the need of supplements by the different group of people to maintain healthy life.							3	1	1	1	2	2	2		
<b>CO2</b>	Understand the need of supplements by the different group of people to maintain healthy life and the outcome of deficiencies in dietary supplements.							3	2	2	1	2	2	2		
<b>CO3</b>	Know about free radicals production and its damaging reactions on lipids, proteins, carbohydrates, nucleic acids and Study about Dietary fibres and complex carbohydrates.							3	2	2	2	1	1	2		
<b>CO4</b>	Understand the effect of Free Radicals' in Various Disorders and ageing, importance and types of Antioxidants and the effect of various environmental factors on the nutraceuticals.							3	1	1	1	1	1	2		
<b>CO5</b>	Appreciate the regulatory and commercial aspects of dietary supplements including health claims. To know about Adulteration of foods.							3	2	2	1	2	2	3		