

CO-PO MAPPING

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.																			
CO-PO MAPPING																			
B. PHARM. YEAR / SEMESTER: First																			
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	PO-9	PO-10	PO-11
BP	BP101T	Human anatomy and Physiology	4	0	1	4	15	75	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11
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	1	1	1	3	3
CO2	Understand the structural and functional classification of skeletal system							3	1	2	2	2	3	3	1	2	1	3	
CO3	Learn the role of blood and lymph ; Understand the function of Lymphatic system							3	1	2	2	1	2	1	1	2	2	2	
CO4	Learn the concepts of Peripheral Nervous System and special senses							3	1	2	2	1	3	2	1	2	1	3	
CO5	Understand the structural and functional classification of Cardiovascular system							3	2	2	3	1	3	2	1	2	2	3	

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B. PHARM. YEAR / SEMESTER: I / 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	PO-8	PO-9	PO-10	PO-11
UG	BP102T	Pharmaceutical Analysis-I	3	1	0	4	15	75	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11
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	3	2	3	2	
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	3	2	3	2	
CO3	Illustrate sources of errors in analytical techniques, methods to minimize them.							3	2	3	3	1	2	1	3	2	3	2	
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	3	2	3	2	
CO5	Describe gravimetry and limit tests-principles and applications.							3	2	3	3	1	2	1	3	2	3	2	
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	3	2	3	2	

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B. PHARM. YEAR / SEMESTER: I / 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	PO-8	PO-9	PO-10	PO-11			
BP	BP103T	Pharmaceutics-1	3	1	0	4	25	75														
CO1	Know about the career opportunities in pharmacy, Pharmacopoeias and history of profession of Pharmacy in India							2	1	1	2	1	2	2	2	2	3	2	1			
CO2	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	2	2	3	2	1			
CO3	To understand the Pharmaceutical calculations, its different system along with methods of calculation.																					
CO4	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	2	3	2	1				
CO5	Explain the different types of monophasic liquids formulations along with their preparation methods.							2	1	1	2	1	2	2	2	3	2	1				
CO6	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	2	3	2	1				
CO7	To know about suppository, its methods of preparation, Displacement value & its calculations.							2	1	1	2	1	2	2	2	3	2	1				
CO8	Describe pharmaceutical incompatibilities, its type with examples.							2	1	1	2	1	2	2	2	3	2	1				
CO9	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	2	3	2	1				

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CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: I / 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	PO-8	PO-9	PO-10	PO-11		
UG	BP104T	Pharmaceutical Inorganic Chemistry	3	1	0	4	15	75													
CO1	Study the monographs of inorganic drugs and pharmaceuticals.							3	2	3	3	1	2	1	3	2	3	2			
CO2	Distinguish the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals.							3	2	3	3	1	2	1	3	2	3	2			
CO3	Recognize the medicinal and pharmaceutical importance of inorganic compounds.							3	2	3	3	1	2	1	3	2	3	2			

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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	PO-8	PO-9	PO-10	PO-11		
BP	BP105T	Communication Skills	2	0	0	2	15	35													
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	3	0	0	0			
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	3	0	0	0			
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	3	0	0	0			
CO4	Students will be made aware about Interview skills, Do's and Don'ts of an interview, Presentation skills:planning and structuring, delivery and techniques of presentation as well							0	3	2	3	3	3	1	3	0	0	0			
CO5	Students will be made aware about Group Discussion and its nuanced aspects: role of communication skills in GD and Do's and Don'ts of GD							0	2	3	0	3	3	3	3	2	0	0			

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CO-PO MAPPING

B PHARM YEAR / SEMESTER : I / 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	PO-8	PO-9	PO-10				
BP	BP106RBT	REMEDIAL BIOLOGY	2	0	0	2	15	35														
CO1	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	2	3	2	3	2			
CO2	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	3	2	3	2	3			
CO3	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	2	3	2					
CO4	Students will be able to learn about circulatory, digestive, respiratory and excretory system of human							3	2	2	2	2	2	2	2	3	2					
CO5	Students will be able to learn about Morphology of plant, Root, Stem, Leaf and its modification							3	2	2	2	2	2	3	3	1	2					

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CO-PO MAPPING

B PHARM YEAR : FIRST YEAR

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	PO-9	PO-10		
BP	BP106RMT	REMEDIAL MATHEMATICS	2	0	0	2	15	35												
CO1	Students will be able to learn about basic skills and extend their knowledge as they prepare for more advanced work.							3	2	3	3	2	2	3	2	3	2			
CO2	Students will be able to learn about mathematical concepts and principles to perform computations for Pharmaceutical Sciences.							3	3	2	2	2	3	2	3	2	3			
CO3	Students will be able to learn about classifications & salient feature of basic mathematics such as Identifying numbers, arrange numbers into arrays, to find solution of pharmacokinetics equations, etc.							3	3	3	3	3	2	1	2	2	2			
CO4	Student shall be able to Know Trigonometry, Analytical geometry, Matrices, Determinant, Integration, Differential equation, Laplace transform and their applications.							2	3	2	2	2	2	2	2	3	2			
CO5	Students will be able to learn to solve the problems of different types by applying theory and appreciate the important applications of mathematics in pharmacy.							3	2	2	2	2	2	3	3	1	2			

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CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: 3rd/VIth

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	PO-9	PO-10	PO-11		
BP	BP201T	HUMAN ANATOMY AND PHYSIOLOGY-II	3	1	0	4	15	75													
CO1	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	3	1	1	1			
CO2	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	2	1	1				
CO3	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	2	1	1				
CO4	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	2	1	1				
CO5	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	2	1	1				

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CO-PO MAPPING

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	PO-8	PO-9	PO-10	PO-11
BP	BP202T	Pharmaceutical Organic Chemistry –I (Theory)	3	1	0	4	25	75	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11
CO1	Recognise the classification, nomenclature and structural isomerism in organic compounds.							3	3	3	1	1	3	3	3	2	3	3	
CO2	Account the preparation and reactions of alkanes, alkenes and conjugated dienes.							3	3	3	1	1	3	3	3	2	3	3	
CO3	Explore the methods of synthesis, reactions and uses of alkyl halides and alcohols.							3	3	3	1	1	3	3	3	2	3	3	
CO4	Investigate the synthetic routes, nucleophilic addition reactions, qualitative tests utilized for carbonyl compounds.							3	3	3	1	1	3	3	3	2	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	3	2	3	3	

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CO-PO MAPPING

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	PO-8	PO-9	PO-10	PO-11
BP	BP203T	Biochemistry	3	1	0	4	15	75	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11
CO1	Understand the importance of metabolism of substrates and their bioregulation							3	2	3	3	1	1	1	2	2	3	2	
CO2	Will acquire chemistry and biological importance of biological macromolecules							3	2	3	3	1	1	1	2	2	3	2	
CO3	Acquainted with qualitative and quantitative estimation of the biological macromolecules							3	2	3	3	1	1	1	2	2	3	2	
CO4	Know, understand and apply the interpretation of data emanating from a Diagnostic Test Lab							3	2	3	3	1	1	1	2	2	3	2	
CO5	To know how physiological conditions and their variation influence the structures and reactivities of biomolecules							3	2	3	3	1	1	1	2	2	3	2	
CO6	To understand the basic principles of protein and polysaccharide structure							3	2	3	3	1	1	1	2	2	3	2	

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CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: Ist/IIInd Year

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	PO-9	PO-10	PO-11		
BP	BP204T	Pathophysiology	3	1	0	4	25	75													
CO1	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	0	0	0	0	0	0	1
CO2	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	0	0	0	0	0	0	1
CO3	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	0	0	0	0	0	1	
CO4	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	0	0	0	0	0	1	
CO5	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	0	0	0	0	0	1	

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CO-PO MAPPING

B. PHARM. YEAR / SEMESTER:1/2

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	PO-9	PO-10	PO-11		
BP	BP205T	COMPUTER APPLICATIONS IN PHARMACY	3	0	0	3	25	50													
CO1	Understanding various types number systems.							3	2	2	1	0	2	0	2	0	0	0	0	0	
CO2	Understanding various types of databases.							2	0	3	0	1	0	3	0	2	0	1	1		
CO3	Understanding various types of application of computers in pharmacy.							1	1	0	0	3	3	0	2	0	3	0			
CO4	Understanding Bioinformatics and databases and impact of Bioinformatics in Vaccine Discovery.							2	2	0	3	2	0	3	0	3	0	2			
CO5	Understanding Computers as data analysis in Preclinical development.							2	0	3	0	3	0	3	0	1	0	2			

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CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: SECOND/THIRD (BP301T)

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	PO-9	PO-10	PO-11	
BP	BP301T	Pharmaceutical Organic Chemistry II	3	1	0	4	25	75												
CO1	Understand the concept of aromaticity, structure and general reactions of Benzene.							3	3	3	2	3	2	2	2	3	2	3	2	3
CO2	recognize different reactions given by different acidic and basic aromatic compounds							3	3	3	2	3	3	2	3	3	3	3	3	
CO3	Learn about lipids, their types and different analytical constants to find the quality of lipids.							3	3	3	2	3	3	2	2	3	2	3		
CO4	Learn about polynuclear hydrocarbons, their reactions and structure elucidation							3	3	3	3	3	2	2	2	3	3	3		
CO5	Learn about cycloalkanes and different theories for the stabilities of cycloalkanes							3	3	3	2	3	2	2	2	3	2	3		

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CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: III/VI

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	PO-9	PO-10	PO-11	
BP	BP302T	Physical Pharmaceutics-1	3	1	0	4	25	75												
CO1	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	2	1	2	1	2	1
CO2	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	2	1	2	1	2	
CO3	understand states of matter and properties of matter, eutectic mixtures and different forms of solids.																			
CO4	Explain various physicochemical properties of drug molecules in designing the dosage forms.							3	1	1	2	0	0	1	2	1	2	1		
CO5	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	2	1	2	1		
CO6	Explain surface active agents, HLB Scale and adsorption at solid interface.							3	1	1	2	0	0	1	2	1	2	1		
CO7	know about complexation, different types of complexation, and their methods of analysis.							3	1	1	2	1	0	1	2	1	2	1		
CO8	Describe protein binding and how protein binding effect on drug action and crystalline structures of complexes.							3	1	1	2	1	0	1	2	1	2	1		
CO9	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	2	1	2	1		

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CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: 2nd/3rd

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	PO-9	PO-10	PO-11	
BP	BP303T	Pharmaceutical Microbiology	3	1	0	4	25	75												
CO1	The students should understand the methods of identification, cultivation and preservation of various microorganisms.							3	1	2	2	1	1	2	1	2	2	2	2	2
CO2	The students should understand about Staining, sterilization and Evaluation of the efficiency of sterilization methods.							3	2	2	3	1	2	2	1	2	1	2	1	2
CO3	To understand about disinfectants, and their evaluation, sterility testing methods of pharmaceutical products.							3	2	2	3	1	2	2	1	2	2	2	2	
CO4	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	1	2	3	2		
CO5	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	1	2	3	2		

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CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: II/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	PO-8	PO-9	PO-10	PO-11	
BP	BP304T	Pharmaceutical Engineering	3	1	0	4	25	75												
CO1	1. Understand the process of size reduction, size separation and fluid flow. 2. Describe the importance of different unit operations used in pharmaceutical manufacturing.							3	3	3	3	2	3	3	2	2	3	3		
CO2	1. Apply the principles of different heat processes used in pharmaceutical industries. 2. Outline the method of different heat processes.							3	3	3	3	2	3	3	3	2	3	3		
CO3	1. Describe the mechanisms involved in drying and mixing processes. 2. Explain different equipments employed in drying and mixing processes.							3	3	3	3	3	3	3	3	2	3	3		
CO4	1. Model the filtration process used during pharmaceutical manufacturing. 2. Recall mechanisms and equipments of centrifugation.							3	3	3	3	2	3	3	2	2	3	3		
CO5	1. Describe different preventive methods used for the control of corrosion in pharmaceutical plants. 2. Assess the significance of material selection and material handling systems during pharmaceutical plant construction.							3	3	3	3	3	3	2	2	3	3	3		

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CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: SECOND/FOURTH (BP401T)

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	PO-9	PO-10	PO-11	
BP	BP401T	Pharmaceutical Organic Chemistry III – Theory	4	0	0	4	25	75												
CO1	Understand te concept of stereoisomerism especially optical isomerism.							3	3	3	2	2	2	3	2	3	2	2		
CO2	Understand te concept of geometrical isomerism							3	3	2	2	3	2	3	3	3	2	2		
CO3	Learn about nomenclature, classification and chemical reactions of heterocyclic compounds.							2	2	3	3	3	3	2	2	3	3	3		
CO4	Understand different reactions and medicinal uses of larger heterocyclic compounds							3	2	3	2	3	2	3	2	3	2	3		
CO5	Learn the concept of reduction, oxidation, rearrangement reactions and their applications							3	3	2	2	3	2	3	2	3	2	3		

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CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: Second/Fourth

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	PO-9	PO-10	PO-11	
BP	BP 402T	Medicinal Chemistry-I	3	1	NA	4	25	75												
CO1	Understand basic concept of medicinal chemistry, physicochemical properties and drug metabolism.							1	1	1	2	2	2	2	0	2	2	1		
CO2	Well acquainted with the chemistry of cholinergic and anti-cholinergic drugs.							2	0	1	2	1	1	2	0	1	2	2		
CO3	To understand chemistry of drugs acting on autonomic nervous system.							1	1	2	2	1	1	2	0	1	1	2		
CO4	Have basic knowledge, chemistry of drugs acting on CNS like sedatiives, hypnotics, antipsychotic & anticonvulsant.							1	1	2	2	1	1	2	0	1	2	2		
CO5	Well acquainted with thw chemistry of general anaesthetics, Narcotic & Non-narcotics and Anti-inflammatory agents.							2	1	2	2	1	1	2	0	1	2	2		

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CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: 2nd /4th

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	PO-9	PO-10	PO-11			
BP	BP 403T	Physical Pharmaceutics-II	3	1	1	4	25	75														
CO1	Understand various physicochemical properties of drug molecules in the designing the dosage form							3	2	2	2	2	3	2	1	2	3	3				
CO2	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	2	3	3				
CO3	Knowledge of physicochemical properties, formulation factors and instability markers in development of biphasic liquid dosages forms.							3	2	2	2	2	3	2	1	2	3	3				
CO4	Demonstrate the application of particle size in designing the dosages forms.							3	2	2	2	2	3	2	1	2	3	3				
CO5	1.Know the principles of chemical kinetics & to use them in assigning expiry date for Formulation							3	2	2	2	2	3	2	1	2	3	3				

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.

CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: II / 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	PO-9	PO-10	PO-11			
BP	BP 404T	Pharmacology-I	3	1	0	4	25	75														
CO1	Understand the pharmacological actions of different categories of drugs							3	2	3	3	2	3	2	2	3	3	3				
CO2	Explain the mechanism of drug action at organ system/sub cellular/macromolecular levels							3	2	3	3	2	2	1	3	2	2	3				
CO3	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases							3	3	3	2	2	3	2	2	3	3	3				
CO4	Observe the effect of drugs on animals by simulated experiments							3	1	2	3	2	1	1	1	1	2	3				
CO5	Appreciate correlation of pharmacology with other bio medical sciences							3	2	3	2	2	2	2	1	2	2	3				

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.

CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: II / 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	PO-9	PO-10	PO-11	
BP	BP 405T	Pharmacognosy and Phytochemistry	4	0	1	4	25	75												
CO1	Gain knowledge on biological source, active constituents and uses of crude drugs							3	2	2	1	1	0	0	0	1	3	3		
	Understand the techniques of evaluation of crude drugs as per the WHO guidelines							3	0	2	2	2	3	3	0	2	0	3		
CO2	Understand the basic principles of cultivation, collection and storage of crude drugs							3	0	2	2	0	0	1	1	2	2	2		
	Application of the crop improvement concepts involved in techniques for improvement of quality of medicinal plants							3	1	2	2	0	3	2	1	2	0	3		
CO3	Exploring the tissue culture technique in medicinal plants							3	2	2	3	0	3	2	1	2	0	2		
CO4	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	0	0	2		
	Understand the principles and application of different system of alternative medicine							3	0	2	1	1	0	0	2	1	2	2		
CO5	Explore novel medicinal agents from different sources of natural origin							3	1	2	0	0	1	0	1	0	2	2		

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.

CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: 3 / 5

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	PO-9	PO-10	PO-11		
BP	BP501T	MEDICINAL CHEMISTRY- II	3	1	0	4	25	75													
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	3	2	3		
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	3	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	3	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	3	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	2	3	3		

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.																		
CO-PO MAPPING																		
B. PHARM. YEAR / SEMESTER : 3rd / 5th																		
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	PO-9	PO-10
BP	BP 504T	Pharmacognosy and Phytochemistry II-	3	1	0	4	25	75	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO1	Discuss the general technique of biosynthesis of phytoconstituents in plants.							2	3	3	3	1	2	2	2	2	2	2
CO2	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	3	3	
CO3	Accomplished in the Isolation, Identification and Analysis of Phytoconstituents.							3	3	2	2	2	2	3	2	2	3	
CO4	Accomplished in the production estimation and utilization of phytoconstituents in industrial scale							2	2	3	3	1	2	2	3	3	3	
CO5	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	2	2	

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.																			
CO-PO MAPPING																			
B. PHARM. YEAR / SEMESTER: 3/5																			
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	PO-9	PO-10	PO-11
BP	BP505T	Pharmaceutical Jurisprudence	3	1	0	4	25	75	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11
CO1	Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals							3	1	3	3	0	2	3	1	2	0	2	
CO2	Various Indian Pharmaceutical Laws							2	2	1	3	0	3	3	0	3	0	2	
CO3	The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals							2	3	1	1	0	2	3	0	0	0	2	
CO4	Code of ethics to be followed during pharmacy practice							2	3	1	1	1	2	3	1	3	0	2	
CO5	Various Intellectual Property Rights							2	3	1	1	0	2	3	0	0	0	2	
CO6	Various offences and penalties in contravention to different Acts							2	3	1	1	0	2	3	0	1	0	2	

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.

CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: 3 / 6

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	PO-9	PO-10	PO-11		
BP	BP601T	MEDICINAL CHEMISTRY- III	3	1	0	4	25	75													
CO1	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	3	2	3		
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 Antibiotics, Anti-infective – Antibacterial, Antiprotozoals, Antivirals, Antifungals and Anthelmintics								3	2	3	3	3	2	2	3	3	2	3		
CO3	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	3	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.								3	2	3	3	3	2	2	3	3	2	3		
CO5	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	2	3	3		
CO6	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	2	2	3		

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.																			
CO-PO MAPPING																			
B. PHARM. YEAR / SEMESTER : 3rd / 6th																			
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	PO-9	PO-10	
BP	BP 603T	Herbal Drug Technology	3	1	0	4	25	75	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	
CO1	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	2	2		
CO2	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	3	3		
CO3	Apprehended the role of natural excipients in Herbal formulations and cosmetics.							2	2	2	2	2	2	3	2	2	3		
CO4	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	3	3		
CO5	Discuss the General Introduction to Herbal Industry and Good Manufacturing Practice of Indian systems of medicine.							3	2	3	3	2	3	1	2	2	2		

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.																				
CO-PO MAPPING																				
B. PHARM. YEAR / SEMESTER: III/VI																				
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	PO-9	PO-10	PO-11	
BP	BP604T	Biopharmaceutics	3	1	0	4	25	75	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	
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	3	2	1		
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	3	2	1		
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	3	2	1		
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	3	2	1		
CO5	explain compartmental modeling, various pharmacokinetic parameters, their significance and applications.							3	1	1	2	1	2	2	2	3	2	1		
CO6	know about kinetics of multiple dosing, calculations of loading and maintenance doses and their significance.							3	1	1	2	1	2	2	2	3	2	1		
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	3	2	1		

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.

CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: 3rd / 6th

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	PO-9	PO-10	PO-11		
BP	BP 605T	Pharmaceutical Biotechnology	3	1	3	4	25	75													
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	2	1	1			
CO2	Understanding Genetic engineering, Study of Recombinant DNA technology, PCR and production of biotechnological products.							3	2	2	3	1	2	2	1	2	1	1			
CO3	Understanding the immune system, Hypersensitivity reactions, Monoclonal antibodies and vaccines.							3	2	2	3	1	2	2	1	2	1	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	2	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	2	1	2			

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.

CO-PO MAPPING

B. PHARM. YEAR / Semester : 3rd / 6th

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	PO-9	PO-10	PO-11		
BP	BP606T	QUALITY ASSURANCE	3	1	0	4	25	75													
CO1	Understand the cGMP aspects in Pharmaceutical industry.							3	3	2	2	3	3	3	2	2	1	2			
CO2	Acquire knowledge about prevention and control of various diseases.							3	3	2	2	3	2	2	2	1	1	2			
CO3	Acquire the scope of certification in pharmaceutical industries.							3	3	2	2	3	3	3	3	1	1	2			
CO4	Understand the responsibilities of QA & QC departments							3	3	2	2	3	2	2	2	1	1	2			

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.

CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: IV / VII

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	PO-9	PO-10	PO-11			
BP	BP701T	Instrumental Methods of Analysis (Theory)	3	1	0	4	25	75														
CO1	Investigate the pharmaceutical substances by UV Visible and fluorescence spectroscopy .							3	3	3	3	1	2	3	3	3	3	3	3	3	3	3
CO2	Analyze the essentials of nepheloturbidometry, flame photometry and atomic absorption spectroscopy.							3	3	3	3	1	2	3	3	3	3	3	3	3	3	3
CO3	Apprehend the analysis of a pharmaceutical substances by chromatographic techniques and electrophoresis.							3	3	3	3	1	2	3	3	3	3	3	3	3	3	3
CO4	Recognize the principle, instrumentation and applications of gas chromatography & high performance liquid chromatography.							3	3	3	3	1	2	3	3	3	3	3	3	3	3	3
CO5	Deal with the fundamentals of ion exchange, affinity chromatography and gel chromatography.							3	3	3	3	1	2	3	3	3	3	3	3	3	3	3

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.

CO-PO MAPPING

B. PHARM. YEAR/Semester : 4th / 7th

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	PO-9	PO-10	PO-11			
BP	BP702T	Industrial Pharmacy-II	3	1	0	4	25	75														
CO1	Acquire the ability about process of pilot plant and scale up of pharmaceutical dosage forms							3	3	3	2	3	3	3	2	2	3	2	3	2	2	2
CO2	Able to communicate the process of technology transfer from lab scale to commercial batch							3	3	3	2	3	2	2	2	2	2	1	2	2	2	2
CO3	Know the different Laws and Acts that regulate pharmaceutical industry							3	3	3	2	3	3	3	3	1	1	2	2	2	2	2
CO4	Understand the approval process and regulatory requirements for drug products							3	3	2	2	3	2	2	2	2	1	1	2	2	2	2

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.

CO-PO MAPPING

B. PHARM YEAR : 4th Year (7th Sem)

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	PO-9	PO-10	PO-11		
BP	703T	Pharmacy Practice	3	1	0	4	25	75													
CO1	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	2	2	2	2	2	2
CO2	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	2	2	2	2	2	
CO3								3	3	3	2	2	2	1	2	3	3	3	3	3	
CO4	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	3	3	3	3	3	
CO5	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	3	3	3	3	3	

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.

CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: 2nd/3rd

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	PO-9	PO-10	PO-11		
BP	BP704T	Novel Drug Delivery Systems	3	1	0	4	25	75													
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	2	3	3	3	3	
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	2	3	3	3		
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	2	1	3	3		
CO4	To understand Targeted Drug Delivery including liposomes, niosomes, nanoparticles, monoclonal antibodies.							3	1	1	3	1	1	2	1	2	1	3	3		
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	2	1	2			

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.																		
CO-PO MAPPING																		
B. PHARM. YEAR : 4th Year / 8th Semester																		
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	PO-9	PO-10
BP	BP 801T	Biostatistics and Research Methodology	3	1	0	4	25	75	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10
CO1	Discuss the applications of Biostatics such as Correlation, Mean, Median, Mode, Range and standard deviation.							1	1	3	1	1	2	0	0	0	0	1
CO2	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	0	0	1
CO3	Apprehended the design of experiments for Phases of clinical trials and observational and experimental studies.							1	2	2	1	0	2	1	0	1	1	
CO4	Accomplished the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of experiment).							1	2	3	3	1	2	0	0	0	0	
CO5	Accomplished the statistical techniques in Design and Analysis of experiments.							1	2	3	2	0	1	1	0	0	1	

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.																			
CO-PO MAPPING																			
B. PHARM. YEAR/Semester : 4 th / 8 th																			
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	PO-9	PO-10	PO-11
BP	BP802T	Social and Preventive Pharmacy	3	1	0	4	25	75	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11
CO1	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	1	1	2	
CO2	Acquire knowledge about prevention and control of various diseases.							3	3	2	2	3	2	3	2	1	1	2	
CO3	Able to understand various national health programs.							3	3	2	2	3	3	3	2	1	1	2	
CO4	Understand about National health intervention programme.							3	3	2	2	3	2	3	2	1	1	2	
CO5	Acquire the knowledge of community services, NRHM and NUHM.							3	3	2	2	3	3	3	2	1	1	2	

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.

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	PO-9	PO-10	PO-11
UG	BP 803ET	Pharmaceutical Marketing Management	3	1	0	4	25	75	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11
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	3	2	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	3	2	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	3	2	3

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.

CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: 4th/8th

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	PO-9	PO-10	PO-11
MPH	BP-804ET	PHARMACEUTICAL REGULATORY SCIENCE	3	1	0	4	25	75	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11
CO1	Understand the concepts of innovator and generic drugs, drug development process.								3	2	2	2	2	3	2	1	2	3	3
CO2	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	2	3	3
CO3	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	2	3	3
CO4	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	2	3	3
CO5	Knowledge of basic terminology, regulatory guidance's, guidelines, laws and acts.								3	2	2	2	2	3	2	1	2	3	3

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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	PO-9	PO-10	PO-11		
BP	BP 805ET	PHARMACOVIGILANCE	6	2	0	8	25	75													
CO1	Understanding History and development of pharmacovigilance							3	0	1	1	1	2	2	1	1	2	3			
CO2	Knowledge of National and International scenario of pharmacovigilance							3	2	3	1	1	2	0	3	3	0	2			
CO3	Being relevant to dictionaries, coding and terminologies used in pharmacovigilance							3	3	2	3	1	2	0	3	2	0	2			
CO4	Detection of new adverse drug reactions and their assessment							2	2	3	1	1	2	0	2	3	2	3			
CO5	Understanding International standards for classification of diseases and drugs							3	3	3	1	1	2	2	3	2	0	3			

FACULTY OF PHARMACY, INTEGRAL UNIVERSITY, LUCKNOW.

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	PO-9	PO-10	PO-11		
BP	BP806ET	Quality Control and Standardization of Herbals	4	0	1	4	25	75													
CO1	Gain knowledge on biological source, active constituents and uses of crude drugs							3	2	2	1	1	0	0	0	1	3	3			
	Understand the techniques of evaluation of crude drugs as per the WHO guidelines							3	0	2	2	2	3	3	0	2	0	3			
CO2	Understand the basic principles of cultivation, collection and storage of crude drugs							3	0	2	2	0	0	1	1	2	2	2			
	Application of the crop improvement concepts involved in techniques for improvement of quality of medicinal plants							3	1	2	2	0	3	2	1	2	0	3			
CO3	Exploring the tissue culture technique in medicinal plants							3	2	2	3	0	3	2	1	2	0	2			
CO4	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	0	0	2			
	Understand the principles and application of different system of alternative medicine							3	0	2	1	1	0	0	2	1	2	2			
CO5	Explore novel medicinal agents from different sources of natural origin							3	1	2	0	0	1	0	1	0	2	2			

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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	PO-9	PO-10	PO-11		
BP	BP807ET	Computer Aided Drug Design	3	1	0	4	25	75													
CO1	Understand the process of Design and discovery of lead molecules							3	2	3	3	2	2	3	3	2	3	2	3	2	
CO2	Appreciate the role of drug design in drug discovery process							3	2	3	3	2	2	3	3	2	3	2	3	2	
CO3	Understand and apply the concept of QSAR and docking							3	2	3	3	2	2	3	3	2	3	2	3	2	
CO4	Apply various strategies to develop new drug like molecules							3	2	3	3	2	2	3	3	2	3	2	3	2	
CO5	Understand the designing of new drug molecules using molecular modeling software							3	2	3	3	2	2	3	3	2	3	2	3	2	
CO6	Appreciate importance of computational methods in drug design and discovery processes							3	2	3	3	2	2	3	3	2	3	2	3	2	

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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	PO-9	PO-10	PO-11		
BP	BP808ET	Cell and Molecular Biology	3	1	0	4	25	75													
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	2	1	2	1	1	
CO2	Understanding about DNA and RNA and their functioning.							3	2	2	3	1	2	2	1	2	1	2	1		
CO3	Students able to Describe protein structure and function, Protein Synthesis.							3	2	2	3	1	2	2	1	2	1	2	1		
CO4	Know the basic molecular genetic mechanisms.							3	1	1	2	1	1	2	1	2	2	2	1		
CO5	Summarize the Cell Cycle including Cell Signals, Receptors for Cell Signals, Signaling Pathways.							3	1	1	3	1	2	2	1	2	1	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	PO-9	PO-10	PO-11			
BP	BP809ET	Cosmetic Science	3	1	0	4	25	75														
CO1	Gain information on key ingredients used in cosmetics and cosmeceuticals							1	1	0	0	0	3	0	0	2	2	1				
CO2	Understand key building blocks of cosmetics for various formulations							1	1	0	0	0	3	0	0	2	1	1				
CO3	Know the current technologies in the market							1	1	0	0	0	3	0	0	2	1	1				
CO4	Understand the scientific principles to develop cosmetics and cosmeceuticals with desired safety							1	1	0	0	0	3	0	0	2	1	1				

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CO-PO MAPPING

M. PHARM.

SPECIALIZATION: Pharmacology

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	PO-9	PO-10	PO-11			
BP	BP810ET	Experimental Pharmacology	3	1	0	4	25	75														
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	0	0	2				
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							3	3	2	3	0	2	1	1	0	0	3				
CO3	Appraised the regulations and ethical requirement for the usage of experimental animals.							3	3	2	1	1	0	1	2	0	1	3				
CO4	Learnt and describe the various preclinical screening methods (in-vitro and in-vivo) involved in the drug discovery process.							3	3	2	1	1	1	2	1	1	0	2				
CO5	Correlate the preclinical data to human's clinical data.							3	3	3	1	1	1	2	1	0	0	3				

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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	PO-9	PO-10	PO-11			
BP	BP811ET	Advanced Instrumentation Techniques	3	1	0	4	25	75														
CO1	Investigate the pharmaceutical substances by NMR spectroscopy and mass spectrometry.							3	3	3	3	1	2	3	3	3	3	3	3	3	3	3
CO2	Analyze the essentials of thermal methods of analysis and X ray diffraction methods.							3	3	3	3	1	2	3	3	3	3	3	3	3	3	
CO3	Apprehend the calibration and validation of analytical instruments.							3	3	3	3	1	2	3	3	3	3	3	3	3	3	
CO4	Recognize the fundamentals of radio immune assay and extraction techniques.							3	3	3	3	1	2	3	3	3	3	3	3	3	3	
CO5	Deal with the fundamentals of hyphenated techniques.							3	3	3	3	1	2	3	3	3	3	3	3	3	3	

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CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: 4th/8th

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	PO-9	PO-10	PO-11			
BP	BP812ET	Dietary Supplements and Nutraceuticals	3	1	3	4	25	75														
CO1	Understand the need of supplements by the different group of people to maintain healthy life.							3	1	1	1	2	2	2	2	2	2	1	3			
CO2	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	2	3	1	3				
CO3	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	2	2	2	2	2			
CO4	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	2	2	2	2	2			
CO5	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	2	2	2	2	1			

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CO-PO MAPPING

B. PHARM. YEAR / SEMESTER: 4th/8th

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	PO-9	PO-10	PO-11		
BP	BP813ET	Pharmaceutical product development	3	1	0	4	25	75													
CO1	Explain pharmaceutical product development							3	0	0	0	0	0	0	0	3	0	3	2		
CO2	Know pharmaceutical excipients							3	0	0	0	0	0	0	0	3	0	3	2		
CO3	Improve pharmaceutical product development by quality by design (QbD) techniques							0	2	3	2	1	0	0	3	0	3	2			
CO4	Application of excipients in pharmaceutical formulations							1	0	2	3	1	0	0	3	0	3	2			