

# NANDED PHARMACY COLLEGE, NANDED

# 2.6 STUDENT PERFORMANCE & LEANING OUTCOMES

2.6.1 Program Outcomes (POS) and Course Outcomes
(COS) for all Programs offered by the institution are stated
and displayed on website

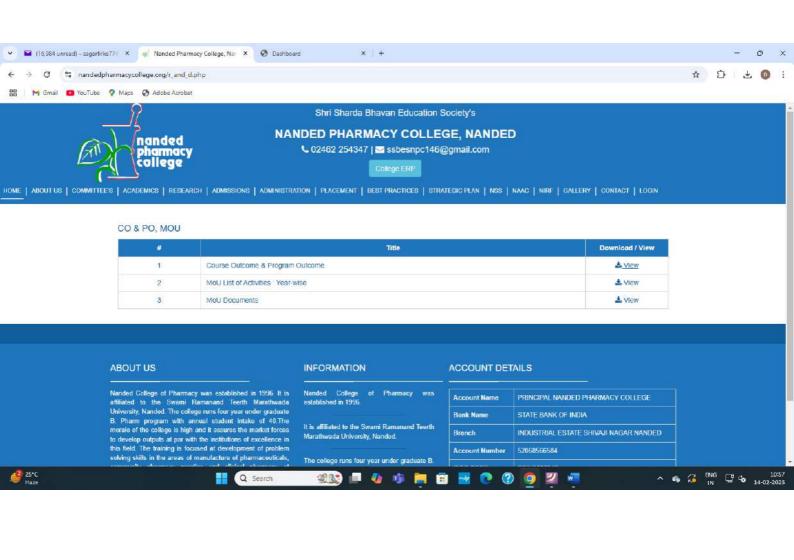
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Shyam Nagar, Nanded - 431 605 Maharashtra India (19.175868,77.307992) Phone - 91 2462 254347 Tele fax No. 91 2462 254445 (O)

Visit: www.nandedpharmacycollege.org.in; Email: ssbesnpc146@gmail.com

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Approved by PCI & AICTE, New Delhi; College DTE Code: 2149; College SRTM University Code: 146

Ref. No. NPC / B. Pharm/

Date:

#### PHARMACY PROGRAM OUTCOMES

#### (B. PHARM & M. PHARM)

Program Outcomes	Statement/Description
	Pharmacy Knowledge: Understand the core and fundamental knowledge
PO1	associated with the pharmacy profession, such as pharmaceutical sciences,
101	biomedical sciences, Ethical and Professional Behaviour, administrative
	pharmacy sciences, and manufacturing practises.
	Planning Abilities: Proper planning skills, including time management,
PO2	professional activity management, resource management, delegation skills, and
102	organisational skills, must be exhibited. Planning of implementation strategies,
	as well as set up tasks to accomplish deadlines.
	Problem analysis: Students will be able to critically analyze and solve complex
PO3	pharmaceutical problems using logical reasoning, scientific principles, and
	evidence-based approaches.
	Design/development of solutions: Design solutions, system and processes for
PO4	complex problems or that meet the specified needs with appropriate
	consideration for the public health and safety, and the cultural, societal, and
	environmental considerations.
	Modern tool usage: Students will be proficient in utilizing modern
PO5	technologies, software applications, and information systems pertinent to
	pharmacy practice while being aware of their limitations.
	Leadership skills: The program will equip students with leadership qualities,
PO6	enabling them to effectively manage and lead interprofessional teams,
	contribute to medication safety initiatives, and drive innovative pharmacy
	practice. ACY COLLEGE



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	Professional Identity: Program will develop a strong professional identity,			
PO7	demonstrating ethical behaviour, integrity, and accountability in all aspects of			
	pharmacy practice.			
	Pharmaceutical Ethics: Maintain personal morals and apply them in social			
	and professional situations. Make moral decisions and accept responsibility for			
PO8	the consequences of those decisions. Maintain Patient confidentiality, informed			
	consent together with responsible use of medications.			
	Communication: Possess excellent communication skills, enabling effective			
	interaction with patients, healthcare professionals, stakeholders and with			
PO9	society at large to provide clear and concise medication counselling, drug			
10)	information, and pharmaceutical care. Able to understand and write effective			
	reports, make effective presentations and documentation, and give and receive			
	clear instructions.			
	The Pharmacist and society: Understand the role of the pharmacist as a			
PO10	healthcare professional and the impact of pharmacy practice on public health,			
	community education, and patient advocacy.			
	Environment and sustainability: The program will foster an awareness in			
	societal and environmental contexts of pharmacy practice, emphasizing the			
PO11	proper disposal of pharmaceutical waste, promoting green initiatives, and			
	optimizing medication use to minimize environmental impact.			
	Life-long learning: Recognize the importance of continuous learning and			
	professional development in the dynamic field of pharmacy. Possess the ability			
PO12	to adapt emerging pharmaceutical trends, technologies, evolving pharmacy			
	regulations and research advancements by engaging in ongoing education and			
	self-directed learning.			

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#### PHARMACY PROGRAM SPECIFIC OUTCOMES

#### (B. PHARM & M. PHARM)

Program Specific Outcomes (PSO)	Statement/Description
PSO1	To train the students in various branches like Pharmaceutics, Pharmacology, Pharmaceutical Chemistry, Pharmacognosy and Pharmacy Practice in order to develop competent professionals, future leaders and responsible citizens.
PSO2	To impart various practical skills and training to the aspiring pharmacist to cater the industry and society in order to create employment opportunities.
PSO3	To develop students' entrepreneurial skills and encourage them to start commercial production of drugs and formulations, sales and marketing, packaging, retail, and wholesale businesses.
PSO4	To enable student to peruse for higher education and research in pharmaceutical and healthcare field.
PSO5	To develop the expertise right from the drug discovery up to its final administration to patient to alleviate suffering of humanity through the practice of pharmacy and to bring happiness to all.

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#### **COURSE OUTCOMES**

#### **PROGRAM: B. PHARMACY**

-	B. PHARM FIRST YEAR-I <sup>ST</sup> SEMESTER			
SUBJECT	CO NO	COURSE OUTCOME	LEVEL	
	BP101TCO1	Knowledge of various homeostatic mechanisms and their imbalances, Body fluids, Systems.	L 1	
	BP101TCO2	Understand the concepts of human body allowing verification of physiological processes through the experiments on living tissues, intact animal or normal human beings.	L 2	
Human Anatomy and Physiology I	BP101TCO3	Apply the skills to Appreciate coordinated working pattern of different organs of each system	L 3	
(Theory)	BP101TCO4	Illustrate the intracellular signalling pathway activation by extracellular signal molecule & functions of various nerves based on the information gained	L 4	
	BP101TCO5	Evaluate the various tissues and organs of different systems of human body.	L 5	
	BP101TCO6	<b>Developing</b> the models or charts to identify the different types of bones in human body, Muscles, junctions, conduction system in the human body	L 6	
	BP107PCO1	Knowledge of determination of different parameters related to blood.	L 1	
Human Anatomy and Physiology I	BP107PCO2	Understand the concepts of human body allowing verification of physiological processes through the experiments on living tissues, intact animal or normal human beings.	L 2	
(Practical)	BP107PCO3	<i>Identify</i> the various tissues of different systems of human body.	L 3	
	BP107PCO4	<i>Illustrate</i> the various experimental techniques related to physiology	L 4	
	BP107PCO5	<i>Evaluate</i> the various tissues, bones and organs of different systems of human body.	L 5	
	BP107PCO6	<b>Developing</b> the models or charts to identify the different types of bones in human body, Muscles, junctions, conduction system in the human body	L 6	





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B. PHARM FIRST YEAR-I <sup>ST</sup> SEMESTER				
SUBJECT	CO NO	COURSE OUTCOME	LEVEL	
	BP102T-CO1	<b>Knowledge</b> and importance of chemical analysis in pharmaceutical industry.	L1	
	BP102T-CO2	<i>Understand</i> fundamental principles of Titrimetric and electro analytical methods.	L2	
Pharmaceutical	BP102T-CO3	<b>Develop</b> problem solving skill required during preparation and standardization of chemical solutions.	L3	
Analysis I (Theory)	BP102T-CO4	<i>Operate</i> the electroanalytical instruments and implement the analytical procedure in correct manner	L4	
	BP102T-CO5	Examine the purity of substance to ascertain its usefulness.	L5	
	BP102T-CO6	<b>Propose</b> new analytical methods & correct implementation of official analytical method.	L6	
	BP108PCO1	<b>Knowledge</b> of official titrimetric methods & limit test use in pharmaceutical industry.	L1	
	BP108PCO2	<i>Understand</i> principle & procedure of Titrimetric and electro analytical methods.	L2	
Pharmaceutical Analysis I (Practical)	BP108PCO3	Apply practical skill & problem-solving skills required during preparation and standardization of chemical solutions.	L3	
	BP108PCO4	Operate and handle critically the electroanalytical instruments	L4	
	BP108PCO5	Evaluate the purity of substance to assure its utility.	L5	
	BP108PCO6	<b>Propose</b> way to minimize errors come across throughout analysis.	L6	





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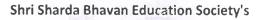
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SUBJECT	CO NO	COURSE OUTCOME	LEVEL		
	BP103T-CO1	Knowledge of pharmacy, development of pharmacy	L1		
	DI 1031-CO1	and the role of pharmacists in health care			
	BP103T-CO2	Understanding dose and dose calculation, routes of	L2		
	B1 1031 CO2	drug administration. Importance of prescription	LZ		
Pharmaceutics I	BP103T-CO3	Practising preparation technique for various dosage	L3		
(Theory)	211001 005	forms, and selection of excipients			
	BP103T-CO4	Analyse basics of incompatibilities and various	L4		
	BI 1031-CO4	additives used for drug product.	<b>D</b> +		
	BP103T-CO5	Evaluate the compounding & dispensing processes of	L5		
		dosage forms.			
	BP103T-CO6	Summarize the techniques used for the	L6		
		characterization of pharmaceutical dosage forms,			
_	BP109P-CO1	Knowledge about the principle and preparation	L1		
		procedure related to conventional dosage forms	LI		
	BP109P-CO2	<i>Understanding</i> the type of conventional dosage forms.	L2		
701	BP109P-CO3	Practising application to create safe, effective, and	L3		
Pharmaceutics I (Practical)		patient-friendly medications	135		
,	BP109P-CO4	Analyse dosage form involves assessing various	L4		
		factors and intended use.	Li		
	BP109P-CO5	Evaluate conventional dosage forms.	L5		
	BP109P-CO6	Develop technique in compounding and dispensing of	L6		
		different dosage forms	LU		







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SUBJECT	CO NO	COURSE OUTCOME	LEVEL	
	BP104TCO1	Knowledge of the principle of purity and recognizing qualitative and quantitative test	L1	
Pharmaceutical Inorganic Chemistry	BP104TCO2	Understand, Summarize, and Relate pharmacopeial description.	L2	
(Theory)	BP104TCO3	<b>Modify</b> and develop methods to determine the impurities in inorganic drugs and pharmaceuticals	L3	
	BP104TCO4	Classify inorganic compounds with their activity	L4	
	BP104TCO5	<b>Determine</b> the structure, properties, reactions, and synthesis of various inorganic compounds.	L5	
	BP104TCO6	Estimate medicinal and pharmaceutical importance of inorganic compounds	L6	
	BP110PCO1	<b>Knowledge</b> of the limit test use in the pharmaceutical industry.	L1	
Pharmaceutical	BP110PCO2	Understand the principle and procedure of synthesis of different compounds	L2	
Inorganic Chemistry (Practical)	BP110PCO3	Apply practical skill & problem-solving skills required during the preparation	L3	
	BP110PCO4	<b>Develop</b> problem-solving skills required during the preparation of chemical solutions	L4	
	BP110PCO5	Determine different anions, cations, and different inorganic pharmaceuticals.	L5	
	BP110PCO6	Estimate the medicinal and pharmaceutical importance of inorganic compounds	L6	



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	B. PHARN	M FIRST YEAR-I <sup>ST</sup> SEMESTER	
SUBJECT	CO NO	COURSE OUTCOME	LEVEL
	BP105T CO1	Knowledge Make acquainted with various communication skills.	L1
	BP105T CO2	Comprehend the concepts pertaining to general communication.	L2
Communication skills	BP105T CO3	Apply of concept of communication process.	L3
(Theory)	BP105T CO4	Analyse the importance of various aspects of communication.	L4
	BP105T CO5	Explain and explore different facets of communication, (Barriers, Elements and styles of Communication)	L5
	BP105T CO6	Create establish and summarise the correlation between communication skills in terms of professional development.	L6
	BP111P CO1	Knowledge Make acquainted with various practical approaches of communication skills.	Li
	BP111P CO2	<b>Comprehend</b> the concepts pertaining to application of communication skills at professional level.	L2
Communication skills	BP111P CO3	Apply of concept of communication process in professional life at different professional level.	L3
(Practical)	BP111P CO4	Analyse the importance of various aspects of communication.	L4
	BP111P CO5	Explain and explore different facets of communication-basic and advanced.	L5
	BP111P CO6	Create establish and summarise the correlation between communication skills in terms of professional development (Listen write & Presentation)	L6

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B. PHARM FIRST YEAR-I <sup>ST</sup> SEMESTER				
SUBJECT	CO NO	COURSE OUTCOME	LEVEL	
	BP 106 T CO1	<b>Remember</b> the basic aspects of botany and zoology and their relation with pharmaceutical sciences.	L1	
	BP 106 T CO2	Understand the characters of living organisms and classification of kingdoms	L2	
Remedial Biology (Theory)	BP 106 T CO3	<i>Identify</i> structure of living cells and their significance	L3	
(Theory)	BP 106 T CO4	Classify system for living things.	L4	
	BP 106 T CO5	<b>Determine</b> role of hormones in regulation of various organs functioning in the body and process of oogenesis and spermatogenesis.	L5	
	BP 106 TCO6	Elaborate the physiology, nutrient requirements for plants and to predict plant/animal tissues.	L6	
	BP 112 PCO3	<b>Remembering</b> list components of anatomy & physiology animal with special reference to human	L1	
Remedial Biology	BP 112 PCO2	Understanding basic components of anatomy & physiology of plant	L2	
(Practical)	BP 112 PCO1	Identify various body component	L3	
	BP 112 PCO4	Examine experiment with microscopic study of plant.	L4	
	BP 112 PCO5	Interpret study of frog by using computer models	L5	
	BP 112 PCO6	Estimate the different test of blood sample.	L6	





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SUBJECT	CO NO	COURSE OUTCOME	LEVEI
	BP 201 TCO1	<b>Describe</b> the general morphology, structure, and purposes of the various human body organs.	L1
	BP 201 TCO2	Explain physiology of different system.	L2
Human Anatomy	BP 201 TCO3	Identify the different tissues and organs of various systems in the human body.	L3
and Physiology II	BP 201 TCO4	Categorize the physiology of urine production, micturition and the anatomy of the excretion system.	L4
(Theory)	BP 201 TCO5	<b>Explain</b> the physiology of male and female reproductive organs and concepts of genetics.	L5
	BP 201 TCO6	Elaborate the different homeostatic mechanisms and their imbalances.	L6
Human Anatomy and Physiology II (Practical)	BP 207PCO1	Describe the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body.	L1
	BP 207PCO2	Understand the construction, working, care and handling of instruments, glassware's and equipment's required for practical.	L2
	BP 207PCO3	<i>Identify</i> the haematological tests like blood cell counts, haemoglobin estimation, bleeding/clotting time etc. and also record blood pressure, heart rate, pulse and respiratory volume.	L3
	BP 207PCO4	Interpret structural and microscopically aspects various organs of human body.	L4
	BP 207 PCO5	Determine the techniques for the identification, counting of various integral components of the body.	L5
	BP 207PCO6	Elaborate working pattern of different organs of each system	L6





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	B. PHARM FIRST YEAR-II <sup>ND</sup> SEMESTER			
SUBJECT	CO NO	COURSE OUTCOME	LEVEL	
	BP202TCO1	<b>Knowledge</b> of the structure, properties, and reactions of various organic functional groups and their relevance to the design and synthesis organic compounds.	L1	
Pharmaceutical	BP202TCO2	<i>Understand</i> , Summarize and Relate rules of IUPAC nomenclature system	L2	
Organic Chemistry	BP202TCO3	<b>Predict</b> the isomerism of organic compounds	L3	
I (Theory)	BP202TCO4	Classify organic compounds with Structure, Functional group and Reactivity	L4	
	BP202TCO5	Evaluate the stability and chemical reactivities of organic compounds	L5	
	BP202TCO6	Interpret mechanism of chemical reactions and develop skills to predict the progress of reaction	L6	
	BP208PCO1	Knowledge & Importance Qualitative Analysis of organic compounds.	L1	
Pharmaceutical Organic Chemistry	BP208PCO2	Understand and Learn Physical Properties of Organic Compounds.	L2	
I (Practical)	BP208PCO3	Apply practical skill & problem-solving skills required during qualitative analysis of organic compounds.	L3	
	BP208PCO4	Classify organic compounds as per functional group and perform their identification test.	L4	
	BP208PCO5	Examine the progress of chemical reactions.	L5	
	BP208PCO6	Develop molecular models' organic compounds.	L6	







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B. PHARM FIRST YEAR-II <sup>ND</sup> SEMESTER			
SUBJECT	CO NO	COURSE OUTCOME	LEVEL
	BP203TCO1	knowledge of the molecular machinery of living cells.	L1
	BP203TCO2	<b>Understanding</b> of the principles that determine the structures of macromolecules and their participation in molecular recognition	L2
	BP203TCO3	<b>Predict</b> how the genetic information is stored and transferred from generation to generation	L3
Biochemistry (Theory)	BP203TCO4	Compare the principles underlying enzymes and hormones and how they regulate biochemical pathways	L4
_	BP203TCO5	<b>Explain</b> the metabolic pathways involved in regulation, energy production, and utilization, and how the alteration of one pathway affects the other	L5
	BP203TCO6	Asses the requirement of micro and macronutrients by humans and how improper intake leads to various clinical conditions.	L6
	BP209P CO1	<b>Knowledge</b> in qualitative and quantitative estimation of the biological macromolecule	L1
	BP209P CO2	Understand the influence and role of structure in the reactivity of biomolecules	L2
Biochemistry (Practical)	BP209P CO3	Apply practical skill & problem-solving skills required during the preparation of chemical solutions.	L3
,	BP209P CO4	Operate and handle critically the electroanalytical instruments	L4
	BP209P CO5	Asses the metabolism of nutrient molecules in physiological and pathological conditions.	L5
	BP209P CO6	Estimate the Role and importance of biological macromolecules	L6





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Ref. No. NPC / B. Pharm/

Date:

B. PHARM FIRST YEAR-II <sup>ND</sup> SEMESTER			
SUBJECT	CO NO	COURSE OUTCOME	LEVEL
Pathophysiology (Theory)	BP204TCO1	Knowledge of signs and symptoms of the diseases.	L 1
	BP204TCO2	Understand the concepts of basic principles of various injury, the etiology and pathogenesis of the selected disease states	L 2
	BP204TCO3	<i>Identify</i> the steps of progression of diseases and their complications based on the gained information.	L 3
	BP204TCO4	Apply the skills to Appreciate the basic mechanisms involved in processes of inflammation and various disease or disorders of different systems.	L 4
	BP204TCO5	<i>Evaluate</i> the homeostasis mechanisms, pathogenesis and treatment of diseases of systems.	L 5
	BP204TCO6	Evaluate the most commonly encountered pathophysiological state(s) and/or disease mechanism(s)	L 6





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Date:

B. PHARM FIRST YEAR-II <sup>ND</sup> SEMESTER			
SUBJECT	CO NO	COURSE OUTCOME	LEVEL
Computer	BP205TCO1	Knowledge of computer fundamentals to pharmaceutical applications	L1
	BP205TCO2	Understanding different types of databases, language, applications of computers for data analysis in Pharmaceutical related activities.	L2
Applications in Pharmacy	BP205TCO3	<b>Practising</b> efficiently the contemporary IT tools to all Pharmaceutical related activities.	L3
(Theory)	BP205TCO4	Analyse the pharmaceutical problems using computers.	L4
	BP205TCO5	<b>Evaluate</b> different application software in community and dispensing pharmacy.	L5
	BP205TCO6	Summarize solutions to analyze pharmaceutical problems using computers.	L6
Computer Applications in Pharmacy (Practicals)	BP210PCO1	Knowledge of word processing programs like MS WORD, MS Access and computer languages like HTML.	L1
	BP210PCO2	Understand the concept of Questionnaire, Web page and use of computers in pharmaceutical industry.	L2
	BP210PCO3	<b>Developing</b> skills to prepare Questionnaire, HTML web page, different types of Databases and creating and exporting tables, forms etc. to web pages and XML pages.	L3
	BP210PCO4	Generating Questionnaires for different diseases and different types of data bases.	L4
	BP210PCO5	Explaining and comparing various online tools for collecting drug information and their adverse effects.	L5
	BP210PCO6	Creating and modifying various computerized documents like Questionnaire, HTML web page, databases, mailing labels etc.	L6

Prof.(Dr.)N.B.Ghiware
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	B. PHARM FIRST YEAR-II <sup>ND</sup> SEMESTER			
SUBJECT	CO NO	CO OUTCOME	LEVEL	
	BP206TCO1	<b>Knowledge</b> of general aspects of environment like food chain, food web, trophic levels, energy transfer etc.	L1	
Environmental	BP206TCO2	<b>Understand</b> the concept of multidisciplinary nature of environment and basic concept of ecosystem.	L2	
Sciences (Theory)	BP206TCO3	<b>Developing</b> skills to help people identifying and solving environmental problems.	L3	
	BP206TCO4	Categorizing different ecosystems, resources and problems associated with them.	L4	
	BP206TCO5	<b>Explaining</b> effects of environmental pollution and various human practices responsible for pollution.	L5	
	BP206TCO6	Creating awareness about environmental problems and motivating to participate in protection and improvement of environment.	L6	







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B. PHARM SECOND YEAR-III <sup>RD</sup> SEMESTER			
SUBJECT	CO NO	COURSE OUTCOME	LEVEL
Pharmaceutical	BP301T CO1	Knowledge about structure, numbering, naming, uses of different organic compounds	L1
	BP301T CO2	Understand the physical properties, stabilities, classification, and uses of the organic/aromatic compounds.	L2
Organic Chemistry II	BP301T CO3	How to develop different methods of preparation of organic/aromatic compounds	L3
(Theory)	BP301T CO4	How to test, analyse, categorise, and distinguish chemically different organic/aromatic compounds	L4
	BP301T CO5	<b>Determine</b> and prove the principle / mechanism of behind synthetic and chemical reactions	L5
	BP301T CO6	Synthesize different derivatives of organic/aromatic compounds	L6
Pharmaceutical	BP305P CO1	<b>Knowledge</b> about structure, numbering, naming, uses of different organic compounds/organic reactions	L1
	BP305P CO2	Understand the physical properties, stabilities, classification, and uses of the organic/aromatic compounds involved in reactions	L <b>2</b>
Organic Chemistry II	BP305P CO3	How to develop different methods of preparation (organic reaction) of organic/aromatic compounds	L3
(Practical)	BP305P CO4	How to test, analyse, categorise, and distinguish chemically different organic/aromatic compounds	L4
	BP305P CO5	<b>Determine</b> physical constants of prepared products / prove the principle / mechanism of behind synthetic and chemical reactions	L5
	BP305P CO6	Synthesize different derivatives of organic/aromatic compounds	L6



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B. PHARM SECOND YEAR-III <sup>RD</sup> SEMESTER			
SUBJECT	CO NO	COURSE OUTCOME	LEVEL
	BP302T CO1	<b>Knowledge</b> of various theories, laws and equations related to different states of matter	Ll
	BP302T CO2	Understand concept of solubility.	L2
Physical	BP302T CO3	Apply the concept of pH, isotonic solutions in preparation of pharmaceutical and biological buffers	L3
Pharmaceutics I (Theory)	BP302T CO4	<b>Distinguish</b> the principles of complexation / protein binding & to use them for calculations of drug release and stability constant.	L4
	BP302T CO5	<b>Explain</b> the surface and interfacial phenomenon and role of surfactants	L5
	BP302T CO6	Elaborate the physicochemical properties of drug molecules,	L6
	BP306PCO 1	<b>Knowledge</b> about different pharmaceutical excipients, their properties, and their functions in formulation development.	LI
	BP306PCO2	<i>Understand</i> the phenomenon of partition coefficient and surface tension	L2
Physical Pharmaceutics I (Practical)	BP306PCO3	Apply the knowledge of phase diagram to determine consolute temperatures, complexation and adsorption isotherms	L3
	BP306PCO4	<i>Illustrate</i> the knowledge of solubility in various pharmaceutical preparations	L4
	BP306PCO5	Interpret various physicochemical tests which involve experiments related to particle size determination, rheology, drug dissolution, pH measurement, and drug content uniformity.	L5
	BP306PCO6	Explain the concept of solubility and recognize basic rules and equations regarding physical principles	L6



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B. PHARM SECOND YEAR-III <sup>RD</sup> SEMESTER			
SUBJECT	CO NO	CO OUTCOME	LEVEL
	BP303TCO1	<b>Knowledge</b> of different microbial control methods and design and working of various equipment's in the pharmaceutical industry.	Li
	BP303TCO2	Understand the morphological and structural aspects of various types of micro-organisms and their role in the development of Pharmaceutical Microbiology.	L2
Pharmaceutical Microbiology (Theory)	BP303TCO3	Apply the skills for preservation, cultivation and growth of micro-organisms and measurements of growth.	L3
	BP303TCO4	<i>Operate</i> various equipment's and instruments used in pharmaceutical industry.	L4
	BP303TCO5	Evaluate and compare various antimicrobial procedures used in the pharmaceutical industries.	L5
	BP303TCO6	Manufacturing of pharmaceutical products and evaluation of various manufacturing facilities.	L6
	BP307PCO1	<b>Knowledge</b> of different microbial control methods and design and working of various equipment's used in the pharmaceutical microbiology laboratory.	L1
Pharmaceutical Microbiology	BP307PCO2	Understand the microbial morphology, principle and procedure used in various microbiological activities like staining, sterilization, inoculation, incubation etc.	L2
(Practical)	BP307PCO3	Apply the skills for preservation, cultivation and growth of micro-organisms and measurements of growth.	L3
	BP307PCO4	<i>Operate</i> various equipment's and instruments used in microbiology laboratory.	L4
	BP307PCO5	Evaluate and compare various antimicrobial procedures and techniques of microbial cultivation.	L5
	BP307PCO6	Preparing different microbial nutrient media and microbial cultures.	L6



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	B. PHARM SECOND YEAR-III <sup>RD</sup> SEMESTER			
SUBJECT	CO NO	COURSE OUTCOME	LEVEL	
	BP304TCO1	<b>Knowledge</b> of design, working and general aspects of various pharmaceutical processes and equipment's used their in.	L1	
Pharmaceutical Engineering	BP304TCO2	Understand the concept of unit operations, various laws, and principles applicable in pharmaceutical operations.	L2	
(Theory)	BP304TCO3	Apply the skills for material handling during pharmaceutical manufacturing process.	L3	
	BP304TCO4	<i>Operate</i> various equipment's and instruments used in pharmaceutical industry.	L4	
	BP304TCO5	Evaluate and measure various factors influencing different pharmaceutical operations.	L5	
	BP304TCO6	Create and discuss the operational data for various pharmaceutical processes.	L6	
Pharmaceutical Engineering	BP308PCO1	Knowledge of design, working and general aspects of various pharmaceutical processes and equipment's used pharmaceutical industry.	L1	
	BP308PCO2	Understand the concept of unit operations, various laws, and principles applicable in pharmaceutical operations.	L2	
(Practical)	BP308PCO3	Apply the skills for material handling during pharmaceutical manufacturing process.	L3	
	BP308PCO4	<i>Operate</i> various equipment's and instruments used in pharmaceutical industry.	L4	
	BP308PCO5	Evaluate and measure various factors influencing different pharmaceutical operations.	L5	
	BP308PCO6	Create and discuss the operational data for various pharmaceutical processes.	L6	

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B. PHARM SECOND YEAR-IV <sup>TH</sup> SEMESTER			
SUBJECT	CO NO	COURSE OUTCOME	LEVEL
	BP401T CO1	Knowledge about structure, numbering, naming, different medicinal uses of organic/heterocyclic/stereochemical compounds	L1
	BP401T CO2	Understand the physical properties, stabilities, classification, and medicinal uses of the organic/heterocyclic/stereochemical compounds	L2
Pharmaceutical Organic Chemistry III	BP401T CO3	How to develop different methods of preparation of organic/ heterocyclic/stereochemical compounds	L3
(Theory)	BP401T CO4	How to test, analyse, categorise, and distinguish chemically different organic/ heterocyclic/stereochemical compounds	L4
	BP401T CO5	Determine and prove the principle/mechanism behind synthetic methods /chemical reactions/stereochemical reactions /rearrangement reactions of organic/ heterocyclic compounds	L5
	BP401T CO6	Synthesize different derivatives of organic/ heterocyclic organic compounds with different methods	L6







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B. PHARM SECOND YEAR-IV <sup>TH</sup> SEMESTER				
SUBJECT	CO NO	COURSE OUTCOME	LEVEL	
	BP402T CO1	<b>Knowledge</b> about category, structure, numbering, naming, and uses of different medicinal compounds	L1	
	BP402T CO2	<i>Understand</i> history, development physicochemical parameters, stabilities, metabolism, classification, and uses of different medicinal compounds	L2	
Medicinal Chemistry I	BP402T CO3	<b>Discover</b> the mechanism of action, protein binding, receptor binding of different ANS and CNS acting drugs	L3	
(Theory)	BP402T CO4	How to analyse structure in relation with their pharmacological activity, categorise and classify according to chemical class of different ANS and CNS acting drugs	L4	
	BP402T CO5	Evaluation of different side effects, toxic effects, drug-food interactions, dosage-regimen, of different ANS and CNS acting drugs	L5	
	BP402T CO6	How to synthesize ANS and CNS acting drugs with different methods/schemes	L6	
	BP406P CO1	Knowledge about category, structure, numbering, naming, and uses of different /Heterocyclic compounds /medicinal compounds/organic reactions	Li	
Medicinal	BP406P CO2	Understand, principle, procedure, and assay of different /Heterocyclic compounds /medicinal compounds	L2	
Chemistry I (Practical)	BP406P CO3	Application of basic principles of organic chemistry for the preparation of different /Heterocyclic compounds /medicinal compounds	L3	
	BP406P CO4	How to analyse medicinal compound quantitatively/Exanimation of partition coefficient	L4	
	BP406P CO5	<b>Determination</b> of physical constant of heterocyclic compounds /medicinal compounds /partition coefficient measurement	L5	
	BP406P CO6	How to synthesize different /heterocyclic compounds /medicinal compounds with different methods/schemes ACY CO/	L6	

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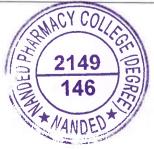
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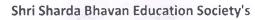
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B. PHARM SECOND YEAR-IV <sup>TH</sup> SEMESTER				
SUBJECT	CO NO	COURSE OUTCOME	LEVEL	
	BP403TCO1	<b>Knowledge</b> of determination of various physicochemical properties such rheological and derived properties of drug, excipients and various formulations.	L1	
Physical	BP403TCO2	<b>Understand</b> the principles of physical pharmacy and their applications in pharmaceutical formulations.	L2	
Pharmaceutics II (Theory)	BP403TCO3	Apply knowledge of physical pharmacy principles to solve processing problems in the pharmaceutical industry.	L3	
	BP403TCO4	<i>Operate</i> various instruments and equipment's which are commonly used in pharmaceutical industry.	L4	
	BP403TCO5	<i>Evaluate</i> the factors influencing the bioavailability of drugs and stability of various formulations.	L5	
	BP403TCO6	Create innovative approaches in drug product development	L6	
	BP407P CO1	<b>Knowledge</b> of physicochemical properties of drug and excipient in development of various formulations.	L1	
	BP407P CO2	Understand the physicochemical principles of drug and their applications in pharmaceutical formulations.	L2	
Physical Pharmaceutics II	BP407P CO3	Application of practical skills acquired to solve the processing problems in pharmaceutical industry.	L3	
(Practical)	BP407P CO4	<i>Operate</i> various instruments and equipment's which are commonly used in pharmaceutical industry.	L4	
	BP407P CO5	<i>Evaluate</i> the factors influencing the stability of various formulations.	L5	
_	BP407P CO6	Create innovative approaches in drug product development	L6	







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	B. PHARM SECOND YEAR-IV <sup>TH</sup> SEMESTER				
SUBJECT	CO NO	COURSE OUTCOME	LEVEL		
	BP404TCO1	Knowledge of pharmacokinetics and pharmacodynamics of drugs in relation to their therapeutic effects	L1		
	BP404TCO2	Understand the fundamental principles of pharmacology, Definition, historical landmarks and scope of pharmacology	L2		
Pharmacology I	BP404TCO3	<i>Identifying</i> and describing the mechanisms of action of commonly used drugs and their therapeutic uses	L3		
(Theory)	BP404TCO4	Analyzing the role of pharmacology in the treatment and management of various diseases and conditions.	L4		
	BP404TCO5	<i>Evaluate</i> Critical research studies on pharmacology and drug development, Nature and source of drugs and essential drugs concept	L <b>5</b>		
	BP404TCO6	<b>Developing</b> an understanding of and Neurohumoral transmissions, drug interactions, drug toxicity, and drug-drug interactions and and potential adverse effects.	L6		
	BP404PCO1	Knowledge to solve practical problems like dose calculations	L1		
	BP404PCO2	Understand the principles of Experimental Pharmacology	L2		
Pharmacology I (Practical)	BP404PCO3	<b>Demonstrate</b> proficiency in laboratory techniques commonly used in pharmacology, such as drug preparation, drug administration to experimental animals, use of instruments for drug analysis	L3		
	BP404PCO4	<i>Operate</i> Various instruments and Aanimal models for behavioral activity in Rodents	L4		
	BP404PCO5	Select Techniques of Terminal and Non terminal blood sampling, anesthesia and Euthanasia	L5		
	BP404PCO6	Elaborate professional ethics and safety guidelines like CPCSEA while conducting experiments, handling drugs, and working in the laboratory.	L6		



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	B. PHARM	SECOND YEAR-IV <sup>TH</sup> SEMESTER	
SUBJECT	CO NO	COURSE OUTCOME	LEVEL
	BP 405 TCO1	Describe classification along with their merits & demerits.	L1
Pharmacognosy and	BP 405 TCO2	Summarize about history and scope of Pharmacognosy.	L2
Phytochemistry I (Theory)	BP 405TCO3	<i>Identify</i> the crude drugs, their uses and chemical nature.	L3
	BP 405 TCO4	<b>Distinguish</b> the techniques in the cultivation and production of crude drugs.	L4
	BP 405 TCO5	Evaluate techniques for the herbal drugs	L5
	BP 405 TCO6	Estimate/Elaborate out the microscopic and morphological evaluation of crude drugs.	L6
	BP 409 PCO1	Describe the quality and purity of crude drugs	L1
Pharmacognosy and	BP 409 PCO2	Understand the skills for the quality control of crude drugs	L2
Phytochemistry I (Practical)	BP 409 PCO3	Identify crude drugs by its microscopical characteristics	L3
	BP 409 PCO4	Analysis of crude drugs by chemical tests.	L4
	BP 409 PCO5	Measure linear measurements for crude drug identification.	L5
	BP 409 PCO6	Elaborate quality control methods for standardization of herbal drugs.	L6





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	B. PHARM THIRD YEAR-V <sup>TH</sup> SEMESTER				
SUBJECT	CO NO	COURSE OUTCOME	LEVEL		
	BP501T CO1	Knowledge about category, structure, numbering, naming, and uses of different medicinal compounds	L1		
	BP501T CO2	Understand history, development physicochemical parameters, stabilities, metabolism, classification, and uses of different medicinal compounds	L2		
Medicinal Chemistry II (Theory)	BP501T CO3	<b>Discover</b> the mechanism of action, protein binding, receptor binding of antihistamines, antidiabetic agents, local anaesthetics, CVS, and endocrine system acting drugs	L3		
В	BP501T CO4	How to analyse structure in relation with their pharmacological activity, categorise and classify according to chemical class of antihistamines, antidiabetic agents, local anaesthetics, CVS, and endocrine system acting drugs	L4		
	BP501T CO5	Evaluation of different side effects, toxic effects, drug- food interactions, dosage-regimen, of antihistamines, antidiabetic agents, local anaesthetics, CVS, and endocrine system acting drugs	L5		
	BP501T CO6	How to synthesize antihistamines, antidiabetic agents, local anaesthetics, CVS, and endocrine system acting drugs with different methods/schemes	L6		





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	B. PHA	ARM THIRD YEAR-V <sup>TH</sup> SEMESTER	
SUBJECT	CO NO	COURSE OUTCOME	LEVE
	BP502TCO1	<b>Knowledge</b> of manufacturing technologies, various excipients commonly used in pharmaceutical industry.	L1
	BP502TCO2	<i>Understand</i> the concepts pertaining to preformulation, regulatory requirements, testing of various formulations.	L2
Industrial Pharmacy I	BP502TCO3	Apply the problem-solving skills to overcome the processing problems.	L3
(Theory)	BP502TCO4	<i>Operate</i> various instruments and equipment's which are commonly used in manufacturing plant.	L4
	BP502TCO5	<i>Evaluate</i> various formulations like tablets, capsules, and cosmetic preparations for their quality attributes.	L5
	BP502TCO6	<b>Designing</b> of various formulations like solid, liquid, semisolid and cosmetic preparations based on the information gained.	L6
	BP506P CO1	<b>Knowledge</b> of formulation technologies, various excipients commonly used in pharmaceutical industry.	L1
Industrial	BP506P CO2	Understanding: Develop a practical understanding of various pharmaceutical manufacturing processes, equipment, and techniques used in industrial settings.	L2
Pharmacy I (Practical)	BP506P CO3	<b>Develop</b> problem-solving skills by analyzing and resolving challenges encountered during the practical exercises.	L3
	BP506P CO4	<b>Operate</b> various instruments and equipment's during practical's which are commonly used in manufacturing plant.	L4
	BP506P CO5	Evaluate formulations for quality attributes.	L5
	BP506P CO6	<b>Designing</b> of various formulations based on the information gained.	L6





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B. PHARM THIRD YEAR-V <sup>TH</sup> SEMESTER				
SUBJECT	CO NO	COURSE OUTCOME	LEVEL	
	BP503TCO1	Knowledge of pharmacokinetics and pharmacodynamics of drugs in relation to their therapeutic effects and potential adverse effects	L 1	
	BP503TCO2	Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases, the cell communication mechanism	L 2	
Pharmacology II (Theory)	BP503TCO3	<i>Identifying</i> and describing the mechanisms of action of commonly used drugs and their therapeutic uses.	L 3	
	BP503TCO4	Analysing the role of pharmacology in the treatment and management of various diseases and conditions	L 4	
	BP503TCO5	Evaluate Critical research studies on pharmacology, Bioassay and drug development, appreciate the newer targets of several disease conditions for treatment.	L 5	
	BP503TCO6	<b>Developing</b> an understanding to Appreciate correlation of pharmacology with related medical sciences.	L 6	
	BP507PCO1	<b>Knowledge</b> of different bioassay methods and determination of different activities, parameters using various methods.	L 1	
	BP507PCO2	Understand the isolation of different organs/tissues from the laboratory animals by simulated experiments	L 2	
Pharmacology II (Practical)	BP507PCO3	<i>Identifying</i> and describing the various receptor actions using isolated tissue preparation	L 3	
	BP507PCO4	Analysing the role of pharmacology in the treatment and management of various diseases and conditions	L 4	
	BP507PCO5	<i>Evaluate</i> Critical research studies on pharmacology, Bioassay and drug development.	L 5	
	BP507PCO6	<b>Developing</b> an understanding to Appreciate correlation of pharmacology with related medical sciences.	L 6	

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## **NANDED PHARMACY COLLEGE**

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Ref. No. NPC / B. Pharm/

Date:

B. PHARM THIRD YEAR-V <sup>TH</sup> SEMESTER			
SUBJECT	CO NO	CO OUTCOME	LEVEL
	BP504T CO1	Knowledge Make acquainted with chemistry of various classes of phytochemicals	L1
	BP504T CO2	<b>Comprehend</b> the concepts pertaining to general methods of extraction (traditional and modern) and isolation	L2
Pharmacognosy and Phytochemistry II	BP504T CO3	Apply concept of chemistry and Pharmacognostic account and their correlation in terms of commercial application	L3
(Theory)	BP504T CO4	Analyse the importance of various phytochemical class as a medicinal agent	L4
	BP504T CO5	<b>Explain</b> different types of Industrial production, its estimation and utilization of the various classes of phytoconstituents	L5
	BP504T CO6	Create/ establish and summarise the correlation between chemistry, phytochemical classification, modern methods of extraction and isolation. determination using suitable analytical techniques	L6
	BP508P CO1	Knowledge- Make acquainted with identification of various classes of phytochemicals	L1
	BP508P CO2	Comprehend the concepts pertaining to general methods of extraction (traditional and modern) and isolation	L2
Pharmacognosy & Phytochemistry II	BP508P CO3	Apply concept of Pharmacognostic account and their correlation in terms of separation and identification	L3
(Practical)	BP508P CO4	Analyse the importance of various detection techniques of phytochemical class	L4
	BP508P CO5	Explain different types of detection of various classes of phytoconstituents	L5
	BP508P CO6	Create/ establish and summarise the correlation between chemistry, phytochemical classification, extraction in terms of Pharmacognostic account	L6

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Date:

	B. PHARM THIRD YEAR-V <sup>TH</sup> SEMESTER				
SUBJECT	CO NO	COURSE OUTCOME	LEVEL		
	BP505TCO1	<b>Knowledge</b> of legal and regulatory framework which govern the pharmaceutical trade and industry.	L1		
	BP505TCO2	<i>Understand</i> the role and importance of regulatory bodies, like, PCI, NPPA, FDA & Drug Laboratories.	L2		
Pharmaceutical Jurisprudence (Theory)	BP505TCO3	<b>Develop</b> the various aspects of patent law, intellectual property rights, Acts and rules that are relevant to the pharmaceutical trade and industry.	L3		
	BP505TCO4	Analyse & identify the different ethical and legal considerations that pharmacists must know.	L4		
	BP505TCO5	Evaluate issues related to drug promotion, advertising, pricing, distributing, repacking, manufacturing.	L5		
	BP505TCO6	Elaborate various issues related to preclinical and clinical research, Import, export manufacturing and trade of Pharmaceuticals.	L6		





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Date:

	B. PHARM THIRD YEAR-VI <sup>TH</sup> SEMESTER				
SUBJECT	CO NO	CO OUTCOME	LEVEI		
	BP601T CO1	Knowledge- Make acquainted with history and various class of anti-infective agents, traditional and computer aided drug discovery	L1		
	BP601T CO2	Comprehend the concepts pertaining to chemistry, detailed chemical classification and nomenclature of various anti-infective agents	L2		
Medicinal Chemistry III	BP601T CO3	Apply concept of chemistry and pharmacological effect and their correlation in terms of mode of action or binding of drugs to target receptors	L3		
(Theory)	BP601T CO4	Analyse the SAR of various anti-infective medicinal agents	L4		
	BP601T CO5	<b>Explain</b> different types of organic synthesis reactions of various anti-infective agents along with their reaction mechanisms; in addition to various reagents implemented in these reactions.	L5		
	BP601TCO6	Create/ establish and summarise the correlation between chemistry, chemical classification, cellular target, SAR and apt use of anti-infective medicinal compounds in clinical use. Information about various drug discovery aspects and components.	L6		
	BP607PCO1	Knowledge Make acquainted with various techniques of synthesis and assay of drugs	Ll		
Medicinal	BP607PCO2	Comprehend the concepts pertaining to chemistry, detailed chemical reactions its mechanism of various medicinal agents	L2		
chemistry III (Practical)	BP607PCO3	Apply concept of chemistry and its correlation for Drawing structures and reactions of drugs	L3		
	BP607PCO4	Analyse the various physicochemical properties of various medicinal agents	L4		
•	BP607PCO5	<b>Explain</b> different types of synthesis reactions along with mechanism of various synthetic agents along with their reaction mechanisms; in addition to various reagents implemented in these reactions.	L5		
	BP607PCO6	Create establish and summarise the correlation between chemistry, physic-chemical properties and its usefulness in various drug discovery aspects	L6		



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	B. PHAR	M THIRD YEAR-VI <sup>TH</sup> SEMESTER	
SUBJECT	CO NO	COURSE OUTCOME	LEVEL
	BP602TCO1	Knowledge of pharmacokinetics and pharmacodynamics of drugs in relation to their therapeutic effects and potential adverse effects	L 1
	BP602TCO2	Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases.	L 2
Pharmacology III (Theory)	BP602TCO3	<i>Identifying</i> and describing the mechanisms of action of commonly used drugs and their therapeutic uses.	L 3
	BP602TCO4	Analysing the role of pharmacology in the treatment and management of various diseases and conditions	L 4
	BP602TCO5	<i>Evaluate</i> Critical research studies on pharmacology, chrono pharmacology and drug development.	L 5
	BP602TCO6	<b>Developing</b> an understanding of chemotherapy, drug toxicity, and Principles of toxicology.	L 6
	BP608PCO1	Knowledge of pharmacokinetics and pharmacodynamics of drugs in relation to their therapeutic effects using different models.	L 1
	BP608PCO2	Understand the the mechanism of drug action and its relevance in the treatment of different infectious diseases.	L 2
Pharmacology III (Practical)	BP608PCO3	<i>Identifying</i> and determining the mechanisms of action of commonly used drugs and their toxicities.	L 3
	BP608PCO4	Analysing the role of pharmacology in the treatment and management of various diseases and conditions	L 4
	BP608PCO5	Evaluate dose calculation and calculation of pharmacokinetic parameters from given data.	L 5
	BP608PCO6	<b>Developing</b> and understanding of Biostatistical methods and effects of therapeutic agents considering different methods by using specific tests and isolated preparations.	L 6

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	B. PHARM THIRD YEAR-VI <sup>TH</sup> SEMESTER			
SUBJECT	CO NO	COURSE OUTCOME	LEVEL	
	BP603T CO1	Knowledge of medicinal herbs, management of the quality of the processes, marketing of medicinal plants and derivatives for use in herbal, food and cosmetic products	L1	
	BP603T CO2	Understanding of the principles and practices of herbal medicine: including the preparation, formulation, and administration of herbal remedies	L2	
Herbal Drug	BP603T CO3	Apply design and conduct research studies on herbal drugs, including the use of appropriate research methodologies and statistical analysis	L3	
Technology (Theory)	BP603T CO4	<b>Evaluate</b> the safety concerns the potential safety concerns associated with herbal drugs, including interactions with other medications and the risk of contamination.	L5	
	BP603T CO5	Analysis of regulatory requirements for herbal drugs, including the approval process, labelling requirements, and post-market surveillance	L4	
	BP603T CO6	Develop and Discuss ICH, WHO guidelines and patenting for herbal drugs	L6	
	BP609PCO1	Knowledge of Herbal Drugs including their sources, preparation methods, therapeutic uses, and herbal drug formulations.	L1	
Herbal Drug Technology (Practical)	BP609PCO2	Understanding the significance of phytochemical screening in the quality assessment and standardization of herbal drugs.	L2	
	BP609PCO3	<b>Practising</b> WHO and ICH guidelines for the evaluation, quality control, manufacturing, and safety assessment of herbal drugs.	L3	
	BP609PCO4	Analyse these guidelines to ensure the quality, safety, and efficacy of herbal drugs.	L4	
	BP609PCO5	Evaluate the suitability and compatibility of natural excipients for use in various dosage forms.	L5	
	BP609PCO6	Develop an understanding and the importance of maintaining quality, safety, and consistency in the manufacturing process	L6	



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B. PHARM THIRD YEAR-VI <sup>TH</sup> SEMESTER			
SUBJECT	CONO	COURSE OUTCOME	LEVEL
	BP604T CO 1	State the concepts of bioavailability and bioequivalence Studies	LI
	BP604T CO 2	<i>Understand</i> the concepts and mechanism of dissolution and in vitro in vivo correlation.	L2
Biopharmaceutics and Pharmacokinetics (Theory)	BP604T CO 3	Use plasma drug concentration -time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination.	L3
(Theory)	BP604T CO 4	<i>Illustrate</i> various compartmental models and non-compartmental analysis methods.	L4
	BP604T CO 5	<i>Evaluate</i> pharmacokinetic processes and their relevance in efficacy of dosage form.	L5
	BP604T CO 6	<b>Discuss</b> the concept of biopharmaceutics and its applications in formulation development	L6
	BP605TCO1	Knowledge of basic concepts, methods, applications, and general aspect of modern sophisticated bioanalytical techniques.	L1
Pharmaceutical	BP605TCO2	Understand the concept of pharmaceutical biotechnology, its scope, applications, and role of micro-organisms in its development.	L2
Biotechnology (Theory)	BP605TCO3	<b>Developing</b> the skills required during advanced biotechnological operations like rDNA technology, immunoblotting techniques, protein engineering, fermentation, enzyme immobilization etc.	L3
	BP605TCO4	Analyze applications and uses of various laboratory biotechniques in diagnosis and treatment of diseases.	L4
	BP605TCO5	<b>Explaining</b> the immunological concepts like types of immunity, hypersensitivity, mutation, microbial genetic transfer etc.	L5
	BP605TCO6	<b>Production</b> of biotechnological products like vitamins, antibiotics, organic acids, vaccines, enzymes, hormones etc.	L6

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	B. PHARM	I THIRD YEAR-VI <sup>TH</sup> SEMESTER	
SUBJECT	CO NO	CO OUTCOME	LEVEL
	BP606TCO1	Knowledge of Practice Consistently run in pharmaceutical industry.	L1
	BP606TCO2	Understand and summarize set of Regulatory Guidelines, Approvals & Certifications of National and International Agencies	L2
Quality Assurance Theory	BP606TCO3	<b>Practice</b> of rules & regulations of drug regulating authority in Pharmaceutical Industries	L3
	BP606TCO4	Examine accountability and practice of Pharmaceutical Industry	L4
	BP606TCO5	Evaluate strategy to control quality in pharmaceutical product throughout product life and restraint quality defects	L5
	BP606TCO6	Create and maintain crucial documents in Pharmaceutical Industry	L6

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	B. PHARN	I FINAL YEAR-VII <sup>TH</sup> SEMESTER	
SUBJECT	CO NO	CO OUTCOME	LEVEL
	BP701TCO1	<i>Knowledge</i> and Importance of Spectrophotometry & Chromatography in Pharmaceutical Industry	L1
	BP701TCO2	Understand fundamental principles of Instrumental Analytical Methods	L2
Instrumental Methods of Analysis	BP701TCO3	<b>Develop</b> problem solving skill required during preparation and standardization of chemical solutions	L3
(Theory)	BP701TCO4	<i>Operate</i> and maintenance of the spectrophotometer and chromatographic instruments	L4
	BP701TCO5	Interpret Records of Spectroscopic and Chromatographic analysis	L5
	BP701TCO6	<b>Propose</b> new analytical methods or correct implementation of official analytical method	L6
	BP705PCO1	Knowledge and Importance of Spectrophotometry & Chromatography in Pharmaceutical Industry	L1
	BP705PCO2	Understand principle & procedure of Photometric and Chromatography Method	L2
Instrumental Methods of Analysis (Practical)	BP705PCO3	Apply practical skill & problem-solving skills required during quantitative and qualitative analysis of substance	L3
	BP705PCO4	<i>Operate</i> and handle critically the spectrophotometer and chromatographic instruments	L4
	BP705PCO5	Interpret Results of Spectroscopic and Chromatographic analysis	L5
	BP705PCO6	<b>Propose</b> way to find & minimize errors come across throughout analysis	L6







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	B. PHARM FINAL YEAR-VII <sup>TH</sup> SEMESTER			
SUBJECT	CO NO	CO OUTCOME	LEVEL	
	BP702TCO1	<b>Knowledge</b> of different Laws and Acts that regulate pharmaceutical industry.	L1	
	BP702TCO2	<b>Understand</b> the principles of technology transfer, regulatory affairs, quality management system and its applications in safety and efficacy of pharmaceutical product.	L2	
Industrial Pharmacy-II	BP702TCO3	Apply principles of process validation to ensure the manufacturing processes are consistent, reliable, and compliant with regulatory requirements.	L3	
(Theory)	BP702TCO4	Analyze regulatory requirements for pharmaceutical manufacturing, including current Good Manufacturing Practices (cGMPs), quality control, and product labelling.	L4	
	BP702TCO5	<b>Evaluation</b> of quality management system, drug approval process, regulatory submission and scale process.	L5	
	BP702TCO6	Analyze regulatory requirements for pharmaceutical manufacturing, including current Good Manufacturing Practices (cGMPs), quality control, and product labelling.	L6	
	BP703T CO 1	Knowledge of various pharmaceutical care services	L1	
	BP703T CO 2	Understand various drug distribution methods in hospital.	L2	
Pharmacy Practice (Theory)	BP703T CO 3	Apply the pharmacy practice for patient counselling in community pharmacy	L3	
	BP703T CO 4	Illustrate the concept of rational drug therapy	L4	
	BP703T CO 5	Interpret selected laboratory results of specific disease state	L5	
	BP703T CO 6	Explain adverse drug reaction and identify drug related problems	L6	

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B. PHARM FINAL YEAR-VII <sup>TH</sup> SEMESTER			
SUBJECT	CO NO	CO OUTCOME	LEVE
	BP704T-CO1	<i>Knowledge</i> of Different types of novel drug delivery systems.	L1
	BP704T-CO2	<i>Understanding</i> the principles and techniques involved in novel drug delivery systems.	L2
Novel Drug Delivery System (Theory)	BP704T-CO3	<b>Developing</b> formulation, selection of excipients, process optimization, and quality control of novel drug delivery system.	L3
	BP704T-CO4	Analyse Regulatory considerations and intellectual property issues related to novel drug delivery systems.	L4
	BP704T-CO5	Evaluate NDDS 's safety, efficacy & stability	L5
	BP704T-CO6	<b>Designing</b> innovative drug delivery approaches to address unmet medical needs.	L6







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	B. PHARM FI	NAL YEAR-VIII <sup>TH</sup> SEMESTER	
SUBJECT	CO NO	CO OUTCOME	LEVEL
SUBJECT	COBP801T.CO1	Knowledge of appropriate statistical tests based on the research question, study design, and data characteristics.	L1
	COBP801T.CO2	Understand the basic principles of research design and methodology, including hypothesis testing, sampling techniques, and study design.	L2
Biostatistics and Research Methodology	COBP801T.CO3	Apply statistical methods to analyze and interpret data, including measures of central tendency, variability, correlation, and regression, parametric and nonparametric test	L3
(Theory)	COBP801T.CO4	Analysis of statistical software to analyze data and generate appropriate graphs and tables to present findings and plagiarism	L4
	COBP801T.CO5	<i>Evaluate</i> the strengths and weaknesses of different types of research studies, including observational studies and experimental designs.	L5
	COBP801T.CO6	<i>Create</i> research findings effectively through Graphs, written reports and oral presentations.	L6
	BP802T-CO1	<b>Knowledge</b> related to the basic concept of public health, health issues, role of Pharmacist.	
	BP802T-CO2	Understand the basic concept of public health, health issues considering socio-cultural factors & role of community Pharmacist in this context.	L2
Social and Preventive	BP802T-CO3	Examine the issues regarding social, economic, cultural, personal hygiene related on health & overall its impact.	L3
Pharmacy (Theory)	BP802T-CO4	Outline the solutions related the management of ailments & disorders arising through various studied causes.	L4
	BP802T-CO5	Assess the surveillance program, national program on such community diseases as well as the management of other lifestyle diseases.	L5
	BP802T-CO6	Integrate the various factors related to the role of Pharmacist in delivering the community services.	L6





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	B. PHARM	FINAL YEAR-VIII <sup>TH</sup> SEMESTER	
SUBJECT	CO NO	CO OUTCOME	LEVEL
	BP803ETCO1	Knowledge of various techniques of marketing and promotion	L1
Pharma Marketing	BP803ETCO2	Understand importance and role of pricing	L2
Management	BP803ETCO3	Application of Emerging concepts in marketing	L3
(Theory)	BP803ETCO4	Categorize various pharmaceutical Channels	L4
	BP803ETCO5	Explain the concepts of marketing and pharmaceutical marketing	L5
	BP803ETCO6	Elaborate Duties of professional sales representative	L6
	BP809ET-CO1	<b>Knowledge</b> of the principles of cosmetic formulation, including the selection of ingredients, their compatibility, and their role in achieving the desired cosmetic effects.	L1
	BP809ET-CO2	Understand the fundamental principles of cosmetic science, including the composition and structure of cosmetic products, and the mechanism of their action on the skin.	L2
Cosmetic Science (Theory)	BP809ET-CO3	Apply problem solving skills to address the processing problems.	L3
	BP809ET-CO4	Analyze the impact of consumer trends on the cosmetics industry, including the use of natural ingredients, sustainability, and ethical production.	L4
	BP809ET-CO5	Evaluate the safety and efficacy of cosmetic products using appropriate scientific methods and testing procedures.	L5
	BP809ET-CO6	<b>Design</b> and develop a understanding of the chemistry of cosmetics, including the composition of raw materials, their properties, and their interactions.	L6







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#### **COURSE OUTCOMES**

#### PROGRAM: M. PHARMACY (PHARMACOLOGY)

M. PHARM FIRST YEAR-I <sup>ST</sup> SEMESTER			
SUBJECT	CO NO	COURSE OUTCOME	LEVEL
	MPL101T CO1	Knowledge of various modern analytical techniques (spectroscopy and chromatography)	L1
	MPL101T CO2	<b>Comprehend</b> the concepts pertaining to instrumentation, principle and working of analytical instruments	L2
Modern	MPL101T CO3	Apply concept from sample preparation to result analysis of various modern analytical techniques	L3
Pharmaceutical Analytical	MPL101T CO4	Analyse the information obtained from different analytical techniques	L4
Techniques	MPL101T CO5	Explain different types of spectroscopy and chromatography techniques along with their working; in addition to its role in Pharmaceutical Industry	L5
	MPL101T CO6	Create/ establish and summarise the correlation between principle, working, instrumentation and applications in Pharmacy.	L6

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M. PHARM FIRST YEAR-IST SEMESTER			
SUBJECT	CO NO	COURSE OUTCOME	LEVEL
	MPL102T CO1	<b>Knowledge</b> of the mechanisms of drug action and the relationship between drug concentration and effect, which is known as pharmacodynamics.	L1
	MPL102T CO1	<b>Understand</b> the principles of pharmacokinetics, including drug absorption, distribution, biotransformation, and elimination.	L2
	MPL102T CO1	Apply concepts of neurotransmission, including the general aspects and steps involved in the process.	L3
Advanced Pharmacology-I	MPL102T CO1	Simplify cardiovascular pharmacology, including diuretics, antihypertensives, anti-ischemics, anti-arrhythmics, drugs for heart failure and hyperlipidemia. autocoid pharmacology and understand the physiological and pathological roles of autocoids	L4
	MPL102T CO1	Determine pathophysiology of diseases and the pharmacology and toxicology of drugs used in various systems, including the autonomic pharmacology system. This includes parasympathomimetics and lytics, sympathomimetics and lytics.	L5
	MPL102T CO1	<i>Elaborate</i> the pharmacology of the central nervous system, including general and local anesthetics, sedatives and hypnotics, drugs used to treat anxiety, depression, psychosis, mania, epilepsy, and neurodegenerative diseases. Additionally, analgesics	L6







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Ref. No. NPC / B. Pharm/

Date:

	M. PHARM FIRST YEAR-I <sup>ST</sup> SEMESTER			
SUBJECT	CO NO	COURSE OUTCOME	LEVEL	
	MPL103CO1	Label the regulations and ethical requirement for the usage of various species and strains of experimental animals and explain CPCSEA guidelines, GLP,	L1	
	MPL103CO2	Classify Bioassay, Explain the principle, scope, limitations, and methods of bioassay	L2	
Pharmacological & Toxicological	MPL103CO3	<i>Identify</i> and explain various preclinical <i>in-vitro</i> , <i>in-vivo</i> and other possible animal alternative models for the screening of classes and different systems.	L3	
Screening Methods-I	MPL103CO4	Categorize and explain various preclinical in-vitro, in-vivo and other possible animal alternative models for the screening of following classes of drugs such as Immunomodulators, Immunosuppressants and immunostimulants	L4	
	MPL103CO5	Explain general principles of Immunoassay and explain Immunoassay methods of evaluation	L5	
	MPL103CO6	<b>Discuss</b> limitations of animal experimentation, alternate animal experiments and explain extrapolation of in vitro data to preclinical and preclinical to humans.	L6	







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M. PHARM FIRST YEAR-I <sup>ST</sup> SEMESTER				
SUBJECT	CO NO	COURSE OUTCOME	LEVEL	
	MPL104TCO1	Knowledge related to the basic components at cellular & molecular level	L1	
	MPL104TCO2	<i>Understand</i> the fundamental structure and functions of cellular components.	L2	
Cellular & Molecular	MPL104TCO3	<b>Examine</b> the interaction of these basic structural and functional components with drugs.	L3	
Pharmacology	MPL104TCO4	<i>Illustrate</i> the basic activities and pathways at molecular level.	L4	
	MPL104TCO5	Access the applicability of molecular pharmacology & biomarkers in new drug discovery process.	L5	
	MPL104TCO6	Explain the receptor signal transduction process, molecular pathways affected by drugs, molecular biology techniques applicable for Pharmacology.	L6	







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M. PHARM FIRST YEAR-I <sup>ST</sup> SEMESTER				
SUBJECT	CO NO	COURSE OUTCOME	LEVEL	
Pharmacology-I (Practicals)	MPL105TCO1	<ul><li>Knowledge of the analytical instruments, its handling</li><li>&amp; basic handling of laboratory animals.</li></ul>	L1	
	MPL105TCO2	Understand the basic techniques of small animal's experimentations.	L2	
	MPL105TCO3	Apply the preclinical in-vivo experimental models on intact animals.	L3	
	MPL105TCO4	Analyse the biological response of the drug using invivo & in-vitro animal models.	L4	
	MPL105TCO5	Conclude the response of the drug over the basic animal model.	L5	
	MPL105TCO6	<i>Explain</i> the possible mechanism of action of the drug.	L6	







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M. PHARM FIRST YEAR-II <sup>ND</sup> SEMESTER			
SUBJECT	CO NO	COURSE OUTCOME	LEVEL
	MPL104TCO1	<b>Recall</b> the fundamentals of general & systemic Pharmacology.	L1
	MPL104TCO2	Understand the pharmacokinetics & pharmacodynamics of the drugs used in treatment of disease.	L2
Advanced Pharmacology-II	MPL104TCO3	Apply the fundamental knowledge to understand the concept of drug action & mechanism.	L3
,	MPL104TCO4	Outline the Pharmacotherapy using Pharmacological & non-Pharmacological measures.	L4
	MPL104TCO5	Assess the Pathophysiology & Pharmacotherapy of the certain disease.	L5
	MPL104TCO6	Explain the mechanism of drug action at cellular & molecular level.	L6
	MPL 202CO1	Describe the basics and the types of toxicology.	L1
	MPL 202CO2	Express the regulatory guidelines for conducting toxicological studies.	L2
Pharmacological & Toxicological Screening Methods- II	MPL 202CO3	Application various toxicity studies as per OECD guidelines.	L3
	MPL 202CO4	Examine special toxicity studies.	L4
	MPL 202CO5	<b>Explain</b> in detail about various methods employed in drug discovery and development.	L5
	MPL 202CO6	Discuss the concept of Safety pharmacology studies, Importance, and applications of toxicokinetic and Alternative methods to animal toxicity testing.	L6

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SUBJECT	CO NO	COURSE OUTCOME	LEVEL
Principles of Drug Discovery	MPL203T CO1	Knowledge of various stages and techniques of drug discovery	Li
	MPL203T CO2	Understand the principles involved mechanisms of drug-receptor and their significance in drug discovery and development.	L2
	MPL203T CO3	Apply computational tools and techniques for drug discovery, including molecular modelling, molecular docking, and structure-activity relationship (SAR) analysis.	L3
	MPL203T CO4	Analyze and evaluate the different strategies and approaches used in drug discovery, such as high-throughput screening, rational drug design, and virtual screening.	L4
	MPL203T CO5	Explain Critically scientific approach of research in the field of drug discovery, and stay updated with the latest advancements and trends of software's/ websites in the field.	L5
	MPL203T CO6	Create/ establish and summarise the correlation between target identification and validation, lead generation, lead optimization, and preclinical and clinical development in Pharmacy.	L6



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•	M. PHARM FIRST YEAR-II <sup>ND</sup> SEMESTER			
SUBJECT	CO NO	COURSE OUTCOME	LEVEL	
	MPL204TCO1	Knowledge of the role and functioning of the Ethical Committee, specifically the Institutional Review Board (IRB), ethical guidelines for biomedical research and the protection of human participants.	L1	
	MPL204TCO2	Understand the origin and principles of International Conference on Harmonization - Good Clinical Practice (ICH-GCP) guidelines and their importance in ensuring ethical conduct in clinical trials.	L2	
Experimental Pharmacology (Practical)	MPL204TCO3	Identify the roles and responsibilities of different personnel involved in clinical trials, including investigators, study coordinators, sponsors, and contract research organizations (CROs), and understand the management of clinical trial documentation.	1.3	
	MPL204TCO4	<b>Distinguish</b> between various types of clinical trials, such as experimental studies (randomized controlled trials and non-randomized controlled trials) and observational studies (cohort studies, case-control studies, and cross-sectional studies).	L4	
	MPL204TCO5	Explain safety monitoring in clinical trials, including the detection, reporting, severity assessment, and management of adverse drug reactions (ADRs).	L5	
	MPL204TCO6	Elaborate the international aspects of pharmacovigilance, including the WHO international drug monitoring program and regulatory terminologies related to ADRs.	L6	

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M. PHARM FIRST YEAR-II <sup>ND</sup> SEMESTER				
SUBJECT	CO NO	COURSE OUTCOME	LEVEL	
	MPL205TCO1	<b>Knowledge</b> of the dissection, isolation, mounting of tissue preparation & assembly setup.	L1	
	MPL205TCO2	Understand the basic techniques related to mounting the tissue to recording of responses in case of <i>in-vitro</i> models.	L2	
Pharmacology Practical II	MPL205TCO3	<b>Examine</b> the vital signs of the animal using guided methodology.	L3	
	MPL205TCO4	Examine the toxicity of the drug as per methodology of the guidelines.	L4	
	MPL205TCO5	Conclude the response of the drug over the basic animal models & clinical studies.	L5	
	MPL205TCO6	<b>Design</b> the protocol for clinical studies, monitoring the clinical aspects of the drugs.	L6	

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M. PHARM SECOND YEAR-III <sup>ND</sup> SEMESTER			
SUBJECT	CO NO	COURSE OUTCOME	LEVEL
	MRM301TCO1	knowledge of biostatistics, including its definition, application, the importance of sample size, factors influencing sample size and statistical tests of significance.	Ll
	MRM301TCO2	Understand the general research methodology and its components, including research objectives, requirements, practical difficulties, review of literature.	L2
Research	MRM301TCO3	Application of medical research, including its history, values in medical ethics, principles of autonomy, beneficence, non-maleficence, double effect.	L3
Methodology & Biostatistics	MRM301TCO4	Analyze study design, types of studies, strategies to eliminate errors/bias, controls, randomization, crossover design, placebo, and blinding techniques	L4
	MRM301TCO4	Discuss CPCSEA guidelines for laboratory animal facilities, including the goals, veterinary care, quarantine, disease surveillance, diagnosis, treatment and control, personal hygiene, facility location, anesthesia, euthanasia.	L5
	MRM301TCO5	<i>Elaborate</i> Declaration of Helsinki and its history, introduction, basic principles for all medical research, and additional principles for medical research combined with medical care.	L6

