CRITERION 2

TEACHING-LEARNING AND EVALUATION

2.6

Student Performance and Learning Outcomes

2.6.1

Program Outcomes (POS)and Course Outcomes

(COS) for all Programs offered by the institution are stated and displayed on website

a) Upload Additional information

2.6 Student Performance and Learning Outcomes

a) Upload Additional information

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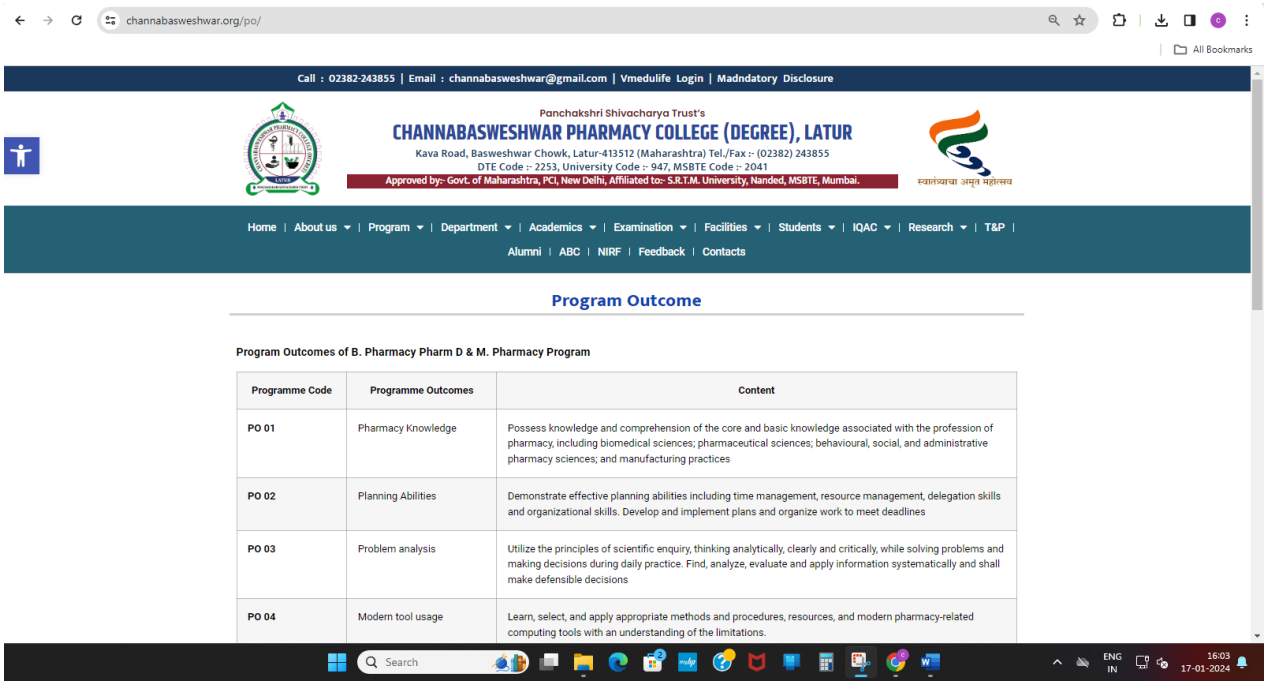
2.6.1 Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered by the institution are stated and displayed on website



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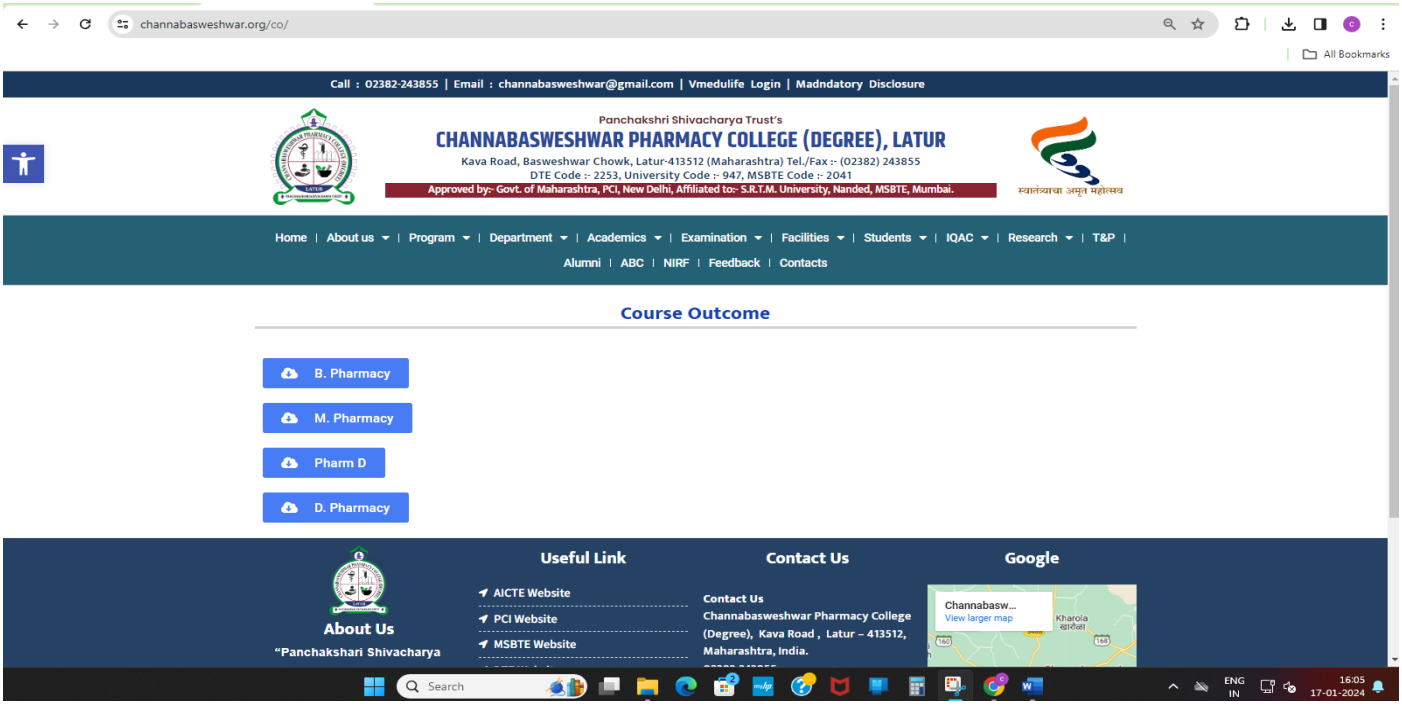

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Program Outcomes of B. Pharmacy Pharm D & M. Pharmacy Program

Programme Code	Programme Outcomes	Content
PO 01	Pharmacy Knowledge	Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioural, social, and administrative pharmacy sciences; and manufacturing practices
PO 02	Planning Abilities	Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines
PO 03	Problem analysis	Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions
PO 04	Modern tool usage	Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
PO 05	Leadership skills	Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfilment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing
PO 06	Professional Identity	Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees)
PO 07	Pharmaceutical Ethics	Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
PO 08	Communication	Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions
PO 09	The Pharmacist and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice
PO 10	Environment and sustainability	Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
PO 11	Life-long learning	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self-assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis

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Program Specific Outcomes (PSO) of B. Pharmacy

PSO Code	Program Specific Outcomes (PSO)
PSO1	Enable graduates to gain theoretical and practical knowledge in different core and allied subjects of pharmaceutical sciences as per the need of pharmaceutical sectors.
PSO2	Enable graduates to exhibit ability to designing of formulation, drug synthesis and screening as per the requirement of pharmaceutical sectors.
PSO3	Enable graduates to show the skills to use modern pharmaceutical tools, software and equipment to analyze & solve the pharmaceutical problems.
PSO4	Enable graduates to understand about various laws that govern different facets of pharmacy that builds up their basic knowledge about the ethics associated with the profession of pharmacy.
PSO5	Enable graduate to practice profession and update with latest advancements made in the field of pharmaceutical product development.

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Program Specific Outcomes (PSO) of Pharm D

PSO Code	Program Specific Outcomes (PSO)
PSO1	Acquire knowledge and understanding of drugs, their therapeutic uses, adverse effects, drug interactions, and management of medication-related problems
PSO2	Demonstrate competencies in the selection, dosage, administration, monitoring of medication therapy, including pharmacokinetics, pharmacodynamics and drug metabolism, and evidence-based practice guidelines
PSO3	Communicate effectively with patients, healthcare providers, and other stakeholders regarding medication therapy and related issues

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Program Specific Outcomes (PSO) of M. Pharm in Pharmaceutics

PSO Code	Program Specific Outcomes (PSO)
PSO1	To acquire knowledge of novel as well as conventional drug delivery systems
PSO2	To identify and resolve the research problems by utilizing the technical skill gained through training and experimentation
PSO3	To utilize the soft skills as a part of team in the professional endeavour

Program Specific Outcomes (PSO) of M. Pharm in Pharmaceutical Quality Assurance

PSO Code	Program Specific Outcomes (PSO)
PSO1	Understand the applications of Quality assurance and Quality control throughout product life cycle
PSO2	To Analyze the Application Based Importance of Emerging Quality Building Concepts in Product Manufacturing
PSO3	To Perform Procedures like Method Validation, Process Validation, Equipment /Facilities/Utilities Validation, Documents and Records Designing as per the Regulatory Standards Leading to Compliance of cGMP
PSO4	To Understand the Regulatory requirements of Pharmaceuticals

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Program Specific Outcomes (PSO) of M. Pharm in Pharmaceutical Chemistry

PSO Code	Program Specific Outcomes (PSO)
PSO1	To acquire advanced knowledge of Analytical Techniques, Pharmaceutical Chemistry, Medicinal Chemistry, Drug Design, Research Methodology and Drug Regulatory Affairs
PSO2	To develop research aptitude to identify and provide valid conclusions for pharmaceutical problems by utilizing the technical skill gained through training and experimentation
PSO3	To utilize the soft skills as a part of team in the professional endeavour

Program Specific Outcomes (PSO) of M. Pharm in Pharmacology

PSO Code	Program Specific Outcomes (PSO)
PSO1	Understand the basic concepts of Anatomy, Physiology, Pathophysiology and Clinical Biochemistry and Pharmacology including pharmacokinetics; pharmacodynamics; drug metabolism; and drug-drug interactions; and the interrelation of these pharmacological properties and pharmacological profile of a drug
PSO2	Understand the application of basic knowledge of Anatomy, Physiology and Pathophysiology, Pharmacotherapeutics, Clinical Pharmacology and Toxicology
PSO3	Understand the approaches for drug discovery and development and the regulatory procedures
PSO4	Know Current clinical judgement and Pharmacological details of major drugs in clinical practice
PSO5	Know etiological factors; pathogenesis, pathophysiological changes that occur in the most common disease states, their clinical presentations and strategy of the therapy along with the choice of drug(s) can act to effectively treat, cure, or mitigate the underlying disease causes and/or symptoms along with the non-pharmacological approaches
PSO6	Understand the physiological, pharmacological, and psychological effects of acute and chronic exposure of individuals to drugs of abuse, and describe the consequences of sudden withdrawal of such a drug from a drug dependent individual

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Course Outcomes

PROGRAMME: B. PHARM

Name of Subject with Code	CO Code	Course Outcomes	Bloom's Level
B. Pharm I (Semester-I)			
BP101T - Human Anatomy and Physiology - Theory	BP101T_CO1	**Explain** the relationships between cell structure and function, histology, gross anatomy, and physiology within various organ systems.	L2, L5
	BP101T_CO2	**Apply** knowledge to clinical scenarios, demonstrating integration and implementation in real-world healthcare situations.	L3
	BP101T_CO3	**Critically** evaluate diverse information sources related to organ systems, distinguishing reliable scientific information from unsourced data and pseudoscience.	L5
	BP101T_CO4	**Assess** social, environmental, and ethical implications of human health and medical research as a responsible member of society.	L5
	BP101T_CO5	**Use** scientific laboratory equipment proficiently to collect and analyze data on human anatomy and physiology.	L3
	BP101T_CO6	**Demonstrate** a holistic understanding of how human organ systems are interrelated, applying this knowledge to approach human health comprehensively.	L2
BP102T - Pharmaceutical Analysis I - Theory	BP102T_CO1	**Recall** and understand fundamental concepts of analytical chemistry.	L1
	BP102T_CO2	**Comprehend** sources of errors in analytical chemistry and techniques to minimize them.	L2, L5
	BP102T_CO3	**Apply** and demonstrate fundamentals of volumetric analytical skills in practical scenarios.	L3
	BP102T_CO4	**Analyze** and explain the basic principles of electrochemical analytical techniques.	L4
	BP102T_CO5	**Evaluate** and enhance student interpretation skills, especially in choosing analytical techniques for estimating drugs of different categories.	L5
BP103T - Pharmaceutics I - Theory	BP103T_CO1	**Acquire** fundamental knowledge of preparatory pharmacy, including the arts and science of preparing conventional dosage forms.	L1, L3
	BP103T_CO2	**Understand** the history of the pharmacy profession and	L2, L5
	BP103T_CO3	**Understand** the basics of dosage forms,	L2, L5

		pharmaceutical incompatibilities, and various pharmaceutical calculations.	
	BP103T_CO4	**Apply** knowledge to prepare various conventional dosage forms.	L3
	BP103T_CO5	**Analyze** the professional way of handling prescriptions.	L4
BP104T - Pharmaceutical Inorganic Chemistry - Theory	BP104T_CO1	**Recall** the principles of limit tests	L1
	BP104T_CO2	**Comprehend** different classes of inorganic pharmaceuticals.	L2, L5
	BP104T_CO3	**Understand** and explain different pharmaceutical buffers, their preparations, uses in pharmaceutical systems, measurement of tonicity, identification of different anions, cations, and different inorganic pharmaceuticals.	L2, L5
	BP104T_CO4	**Apply** knowledge about sources of impurities and methods to determine impurities in inorganic drugs and pharmaceuticals.	L3
	BP104T_CO5	**Analyze** the medicinal and pharmaceutical importance of inorganic compounds	L4
	BP104T_CO6	**Recall** a variety of inorganic drug classes.	L1
BP105T - Communication Skill - Theory	BP105T_CO1	**Understand** the behavioral needs for a pharmacist to function effectively in pharmaceutical operations.	L2, L5
	BP105T_CO2	**Communicate** effectively, both verbally and non-verbally.	L1
	BP105T_CO3	**Effectively** manage a team as a team player.	L3
	BP105T_CO4	**Develop** interview skills, leadership qualities, and essentials.	L3, L6
BP106RBT - Remedial Biology - Theory	BP105T_CO1	**Study** the classification and salient features of the five kingdoms of life.	L3, L4
	BP106RBT_CO2	**Understand** the basic components of anatomy & physiology of plants with a special reference to humans.	L2, L5
	BP106RBT_CO3	**Understand** the basic components of anatomy & physiology of animals, with a special reference to humans.	L2, L5
	BP106RBT_CO4	**Apply** knowledge to learn and understand the components of the living world, structure, and functional systems of the plant and animal kingdom.	L3
BP106RMT - Remedial Mathematics – Theory	BP106RMT_CO1	**Recall** and demonstrate fundamental mathematical concepts and operations.	L1
	BP106RMT_CO2	**Understand** the principles and applications of basic mathematical operations, including arithmetic, algebra, and geometry.	L2, L5
	BP106RMT_CO3	**Apply** mathematical concepts to solve real-world problems and scenarios.	L3
	BP106RMT_CO4	**Analyze** and interpret mathematical data, recognizing patterns and relationships.	L4
	BP106RMT_CO5	**Evaluate** mathematical solutions for accuracy and relevance in specific contexts.	L5
	BP106RMT_CO6	**Develop** problem-solving strategies and methods for approaching mathematical challenges.	L3, L6
	BP106RMT_CO7	**Applying** Mathematical Skills: Apply mathematical	L3

		skills to other academic disciplines and practical situations.	
BP107P - Human Anatomy and Physiology - Practical	BP107P_CO1	**Recall** and describe the gross morphology, structure, and functions of cells, skeletal, muscular, and cardiovascular systems of the human body.	L1
	BP107P_CO2	**Understand** various homeostatic mechanisms and recognize their imbalances.	L2, L5
	BP107P_CO3	**Identify** different types of bones in the human body.	L3
	BP107P_CO4	**Identify** different the various tissues in the human body.	L3
	BP107P_CO5	**Apply** knowledge of experimental techniques related to physiology.	L3
	BP107P_CO6	**Perform** various techniques such as blood group determination, blood pressure measurement, and blood cell counting.	L3
BP108P - Pharmaceutical Analysis I - Practical	BP108P_CO1	**Explore** and comprehend key concepts relevant to drug analysis	L2, L5
	BP108P_CO2	**Acquire** skills in the identification and characterization of pure drug substances using various analytical techniques	L1, L3
	BP108P_CO3	**Perform** assays related to pharmaceutical analysis.	L3
	BP108P_CO4	**Understand** the concept of analysis in pharmaceuticals.	L2, L5
BP109P - Pharmaceutics I - Practical	BP109P_CO1	**Recall** the principles used in the preparation of solid, liquid, and semi-solid dosage forms.	L1
	BP109P_CO2	**Experiment** with monophasic liquid dosage forms for internal and external administration.	L4, L6
	BP109P_CO3	**Experiment** with biphasic liquid dosage forms for internal and external administration	L4, L6
	BP109P_CO4	**Design** powders, granules dosage forms	L6
	BP109P_CO5	**Design** semi-solid dosage forms	L6
	BP109P_CO6	**Formulate** suppositories dosage forms.	L6
BP110P - Pharmaceutical Inorganic Chemistry - Practical	BP110P_CO1	**Prepare** exact solutions for quantitative analysis.	L3
	BP110P_CO2	**Identify** the purity of inorganic compounds quantitatively.	L3
	BP110P_CO3	**Analyze** inorganic samples qualitatively.	L4
	BP110P_CO4	**Synthesize** inorganic compounds.	L6
	BP110P_CO5	**Identify** inorganic pharmaceuticals.	L3
	BP110P_CO6	**Adjudge** the level of specific impurities in given inorganic compounds through different limit tests.	L5
BP111P - Communication Skill - Practical	BP111P_CO1	**Develop** knowledge, skills, and judgment around human communication for effective collaboration.	L3, L6
	BP111P_CO2	**Apply** practical skills for effective communication, both verbal and non-verbal.	L3
	BP111P_CO3	**Distinguish** pronunciation of vowel and consonant sounds.	L4
	BP111P_CO4	**Take** part in advanced learning on comprehension, direct and indirect speech, and develop interview handling skills.	L3
	BP111P_CO5	**Improve** email etiquette for professional communication.	L6
BP112RBP -	BP112RBP_CO1	**Identify** and classify organisms based on their	L3

Remedial Biology – Practical		characteristics and salient features within the five kingdoms of life.	
	BP112RBP_CO2	**Observe** and analyze the basic components of plant anatomy and physiology.	L2, L3, L5
	BP112RBP_CO3	**Understand** the fundamental components of animal anatomy and physiology, with a special focus on human biology.	L2, L5
	BP112RBP_CO4	**Apply** knowledge of the components of the living world to comprehend the structure and functional systems of plant and animal kingdoms.	L3
	BP112RBP_CO5	**Analyze** and interpret experimental data related to biological concepts.	L4
	BP112RBP_CO6	**Perform** experiments related to classification, anatomy, and physiology to reinforce theoretical knowledge.	L3
	BP112RBP_CO7	**Apply** biological concepts learned in theory to practical situations and scenarios.	L3
	BP112RBP_CO8	**Engage** in problem-solving exercises that require the application of biological principles.	L3
B. Pharm I (Semester-II)			
BP201T - Human Anatomy and Physiology II - Theory	BP201T_CO1	**Recall** and describe the structure and function of the nervous, endocrine, respiratory, urinary, and reproductive systems in the human body.	L1
	BP201T_CO2	**Understand** the interlinked mechanisms involved in the maintenance of normal functioning of the human body, emphasizing energy and metabolism.	L2, L5
	BP201T_CO3	**Apply** practical knowledge by performing experiments such as neurological reflex, body temperature measurement, olfaction, gustation reflex, and eyesight.	L3
	BP201T_CO4	**Apply** the knowledge gained to analyze and explain physiological processes within the human body.	L3
BP202T - Pharmaceutical Organic Chemistry I - Theory	BP202T_CO1	**Recall** the structure and name of organic compounds	L1
	BP202T_CO2	**Understand** the types of isomerism	L2, L5
	BP202T_CO3	**Recall** the reaction, name the reaction and orientation of reactions	L3
	BP202T_CO4	**Understand** the concept of reactivity/stability of compounds.	L4
	BP202T_CO5	**Apply** knowledge to identify and confirm unknown organic compounds.	L3
	BP202T_CO6	**Analyze** and name reactions of carbonyl compounds.	L4
	BP202T_CO7	**Perform** common laboratory techniques including reflux, distillation, recrystallization, vacuum filtration, etc.	L3
BP203T - Biochemistry - Theory	BP203T_CO1	**Recall** and explain the role, classification, and metabolism of various biomolecules (carbohydrates, proteins, and lipids).	L1
	BP203T_CO2	**Understand** the concepts of biological oxidation and bioenergetics.	L2, L5
	BP203T_CO3	**Apply** knowledge to discuss the metabolism of nucleic acids and protein biosynthesis.	L3

	BP203T_CO4	**Analyze** the application of enzyme inhibition in the pharmaceutical industry.	L4
BP204T - Pathophysiology - Theory	BP204T_CO1	**Apply** the knowledge of pathophysiology to understand the rationale behind pharmacological interventions and treatment modalities.	L3
	BP204T_CO2	**Analyze** the etiology and pathogenesis of selected disease states, name the signs and symptoms of diseases, and mention complications.	L4
	BP204T_CO3	**Understand** the fundamental principles of pathophysiology, including the normal physiological processes that can be disrupted in disease states.	L2, L5
	BP204T_CO4	**Identify** the manifestations and clinical signs of different diseases, recognizing the importance of early detection and diagnosis.	L3
	BP204T_CO5	**Explain** the mechanisms of inflammation and immune response in the context of various diseases, including autoimmune disorders.	L2, L5
BP205T - Computer Applications in Pharmacy - Theory	BP205T_CO1	**Recall** knowledge about the decimal, binary, octal, and hexadecimal number systems.	L1
	BP205T_CO2	**Apply** knowledge in project-based web development for creating dynamic web pages and understanding web applications and internet tools.	L3
	BP205T_CO3	**Instruct** on collecting drug data, records, and files, drug management,	L3
	BP205T_CO4	**Identify** and analyze biological drug targets	L3
	BP205T_CO5	**Teach** computers as data analysis tools in preclinical development using software applications.	L1, L3
BP206T - Environmental Science - Theory	BP206T_CO1	**Create** awareness about environmental problems among learners.	L6
	BP206T_CO2	**Impart** basic knowledge about the environment and related problems.	L3
	BP206T_CO3	**Develop** an attitude of concern for the environment and motivate learners to participate in environmental protection.	L3, L6
	BP206T_CO4	**Acquire** skills to help individuals identify and solve environmental problems.	L1, L3
	BP206T_CO5	**Strive** to attain harmony with nature.	L3
BP207P - Human Anatomy and Physiology II - Practical	BP207P_CO1	**Identify** and demonstrate the anatomical structures of the nervous, endocrine, respiratory, urinary, and reproductive systems through hands-on practical sessions.	L3
	BP207P_CO2	**Apply** practical skills to perform experiments related to neurological reflexes, body temperature measurement, olfaction, gustation reflex, and eyesight, ensuring accuracy and precision.	L3
	BP207P_CO3	**Analyze** experimental results to draw conclusions about the functioning of physiological mechanisms within the human body.	L4
	BP207P_CO4	**Interpret** data obtained from practical sessions to understand the physiological responses of the human body in various scenarios.	L2, L5
	BP207P_CO5	**Engage** in problem-solving exercises related to physiological experiments, including troubleshooting	L3

		and proposing solutions to challenges encountered.	
	BP207P_CO6	**Apply** common laboratory techniques proficiently, including proper handling of laboratory equipment, maintaining safety protocols, and recording accurate observations.	L3
	BP207P_CO7	**Collaborate** with peers to perform group experiments, fostering teamwork and communication skills.	L6
	BP207P_CO8	**Effectively** communicate findings and observations through written reports, reinforcing the importance of clear and concise scientific communication.	L3
BP208P - Pharmaceutical Organic Chemistry I - Practical	BP208P_CO1	**Explain** the qualitative analysis and preparation of pharmaceutical organic compounds.	L2, L5
	BP208P_CO2	**Identify** functional elements present in pharmaceutical organic compounds.	L3
	BP208P_CO3	**Analyze** the presence of various functional groups in pharmaceutical compounds.	L4
	BP208P_CO4	**Appraise** the rules concerned with reactivity and orientation of organic compounds.	L5
	BP208P_CO5	**Analyze** unknown pharmaceutical organic compounds by determining their melting point/boiling point.	L4
	BP208P_CO6	**Prepare** and characterize derivatives of organic compounds.	L3
BP209P - Biochemistry - Practical	BP209P_CO1	**Practice** determining carbohydrates and proteins.	L3
	BP209P_CO2	**Practice** handling various instruments used in biochemical investigations and perform identification tests as per the Indian Pharmacopoeia.	L3
	BP209P_CO3	**Identify** normal and abnormal biochemical constituents of urine.	L3
	BP209P_CO4	**Analyze** and determine the factors affecting enzyme activity.	L4
BP210P - Computer Applications in Pharmacy - Practical	BP210P_CO1	**Create** documents demonstrating proficiency in word processing.	L6
	BP210P_CO2	**Develop** skills in using Microsoft Access effectively.	L3, L6
	BP210P_CO3	**Instruct** on reporting and printing reports from the patient database using MS Access.	L3
	BP210P_CO4	**Design** forms in MS Access for viewing, adding, deleting, and modifying patient records.	L6
	BP210P_CO5	**Practice** using computers for drug data information, record-keeping, and data recovery.	L3
	BP210P_CO6	**Practice** adding information to web pages using tables, queries, forms, and reports.	L3
	BP210P_CO7	**Design** the web pages using HTML and XML.	L6
B. Pharm II (Semester-III)			
BP301T - Pharmaceutical Organic Chemistry II - Theory	BP301T_CO1	**Recall** the structure, name, and the type of isomerism of organic compounds.	L1
	BP301T_CO2	**Recall** the reactions, name reactions, and orientation of reactions.	L1
	BP301T_CO3	**Understand** the concept of reactivity/stability of compounds.	L2, L5

	BP301T_CO4	**Practice** the preparation of organic compounds.	L3
BP302T - Physical Pharmaceutics I - Theory	BP302T_CO1	**Understand** various physicochemical properties of drug molecules in designing dosage forms.	L2, L5
	BP302T_CO2	**Know** the principles of chemical kinetics and apply them for stability testing and determining the expiry date of formulations.	L1, L3
	BP302T_CO3	**Demonstrate** the use of physicochemical properties in the formulation development and evaluation of dosage forms.	L2
	BP302T_CO4	**Demonstrate** the preparation of buffer and isotonic solutions and determination of pH	L2
	BP302T_CO5	**Analyze** the drug complexes by various methods and interpret the data	L4
BP303T - Pharmaceutical Microbiology - Theory	BP303T_CO1	**Understand** methods of identification, cultivation, and preservation of various microorganisms.	L2, L5
	BP303T_CO2	**Apply** the knowledge of sterilization and disinfection process in pharmaceutical industry	L3
	BP303T_CO3	**Demonstrate** the how sterility testing will be done for pharmaceutical products.	L2
	BP303T_CO4	**Design** and plan a sterile area, describe sources and prevention of contamination	L6
	BP303T_CO5	**Understand** cell culture technology and its applications in pharmaceutical industries.	L2, L5
BP304T - Pharmaceutical Engineering - Theory	BP304T_CO1	**Describe** the principles and methodology of various unit operation processes and their application in the pharmaceutical manufacturing industry.	L2
	BP304T_CO2	**Teach** how to analyze the use of correct material and handling techniques for the construction of pharmaceutical plants.	L1, L3
	BP304T_CO3	**Understand** the concept of corrosion and its preventive measures in the pharmaceutical manufacturing industry.	L2, L5
	BP304T_CO4	**Apply** engineering principles to address real-life issues in various pharmaceutical manufacturing processes.	L3
BP305P - Pharmaceutical Organic Chemistry II - Practical	BP305P_CO1	**Acquire** basic knowledge regarding general methods of preparation of organic compounds.	L1, L3
	BP305P_CO2	**Understand** the reactions of some organic compounds.	L2, L5
	BP305P_CO3	**Understand** the reactivity of organic compounds.	L2, L5
	BP305P_CO4	**Identify** or confirm the identification of organic compounds.	L3
BP306P - Physical Pharmaceutics I - Practical	BP306P_CO1	**Educate** on various derived properties of drug molecules in the formulation of dosage forms.	L3
	BP306P_CO2	**Demonstrate** various instrumentation of physicochemical and derived properties in the formulation of dosage forms.	L2
	BP306P_CO3	**Evaluate** various dosage forms using physicochemical and derived properties.	L5
	BP306P_CO4	**Remember** principles of chemical kinetics and stability to use them for stability testing and determination of the expiry date of formulations.	L1

BP307P - Pharmaceutical Microbiology – Practical	BP306P_CO1	**Understand** practical methods of identification, cultivation, and preservation of various microorganisms.	L2, L5
	BP306P_CO2	**Implement** the sterilization process in pharmaceutical industry	L3
	BP306P_CO3	**Understand** the importance of sterility testing	L2, L5
	BP306P_CO4	**Perform** various experiments related to microbiological analysis	L3
BP308P Pharmaceutical Engineering - Practical	BP308P_CO1	**Conduct** experiments related to unit operation processes involved in pharmaceutical manufacturing.	L3
	BP308P_CO2	**Operate** equipment used in the manufacture of pharmaceutical products.	L3
	BP308P_CO3	**Analyze** and interpret data generated from experiments, including graph and data representation.	L4
	BP308P_CO4	**Demonstrate** knowledge about the equipment used in pharmaceutical dosage form manufacturing.	L2
B. Pharm II (Semester-IV)			
BP401T Pharmaceutical Organic Chemistry III – Theory	BP401T_CO1	**Acquire** knowledge of stereochemical features, including conformation and stereo electronic effects; understand geometrical isomers.	L1, L3
	BP401T_CO2	**Acquire** the knowledge and understanding of the basic experimental principles of heterocyclic chemistry	L1, L3
	BP401T_CO3	**Create** a simple pharmaceutically active organic compounds, especially five and six-membered heterocyclic compounds.	L6
	BP401T_CO4	**Describe** detailed mechanisms for common naming reactions.	L2
BP402T Medicinal Chemistry I – Theory	BP402T_CO1	**Identify** the physiochemical properties influencing drug behavior in the body	L3
	BP402T_CO2	**Comprehend** the chemistry of drugs in relation to their pharmacological activity.	L2, L5
	BP402T_CO3	**Explain** the interplay between drug metabolism, adverse effects, and therapeutic benefits.	L2, L5
	BP402T_CO4	**Understand** the Structural Activity Relationship (SAR) of different class of drugs and chemical synthesis of some drug.	L2, L5
	BP402T_CO5	**Understand** the classification, mechanism of action, and uses of drugs.	L2, L5
BP403T Physical Pharmaceutics II – Theory	BP403T_CO1	**Understand** various physical and chemical properties of drug substances in designing dosage forms.	L2, L5
	BP403T_CO2	**Apply** physical and chemical properties in the development of formulations.	L3
	BP403T_CO3	**Demonstrate** the use of physicochemical properties in the evaluation of formulations.	L2
	BP403T_CO4	**Understand** the concepts and principles of chemical kinetics and stability;	L2, L5
	BP403T_CO5	**Apply** concepts and principles of chemical kinetics in determining the stability and expiry date of drug products.	L3

BP404T Pharmacology I – Theory	BP404T_CO1	**Understand** the pharmacological actions of different categories of drugs.	L2, L5
	BP404T_CO2	**Explain** the mechanism of drug action at organ system/subcellular/macromolecular levels.	L2, L5
	BP404T_CO3	**Apply** basic pharmacological knowledge in the prevention and treatment of various diseases.	L3
	BP404T_CO4	**Understand** basic pharmacological concepts and explain the pathophysiology of various disorders.	L2, L5
	BP404T_CO5	**Explain** the pathophysiology of various disorders.	L2, L5
BP405T Pharmacognosy and Phytochemistry I – Theory	BP405T_CO1	**Explain** the fundamentals of Pharmacognosy, including the scope, classification of crude drugs, their identification and evaluation, phytochemicals present in them, and their medicinal properties.	L2, L5
	BP405T_CO2	**Understand** techniques in the cultivation and production of crude drugs.	L2, L5
	BP405T_CO3	**Know** the uses and chemical nature of crude drugs	L1, L3
	BP405T_CO4	**Understand** evaluation techniques for herbal drugs.	L2, L5
	BP405T_CO5	**Carry** out microscopic and morphological evaluation of crude drugs.	L3
BP406P Medicinal Chemistry I – Practical	BP406P_CO1	**Prepare** medicinal compounds or intermediates.	L3
	BP406P_CO2	**Perform** assays of drugs from their formulations.	L3
	BP406P_CO3	**Apply** knowledge to determine the partition coefficient of a few drugs.	L3
	BP406P_CO4	**Study** chemical structures and pharmacological actions.	L3, L4
BP407P Physical Pharmaceutics II – Practical	BP407P_CO1	**Determine** physicochemical properties in the formulation development and evaluation of dosage forms.	L5
	BP407P_CO2	**Use** principles of chemical kinetics for stability testing.	L3
	BP407P_CO3	**Compare** and contrast different methods used in determining the same physicochemical parameters.	L2, L4, L5
	BP407P_CO4	**Demonstrate** and explain the effects of different excipients and their concentrations on physicochemical determinants of dosage forms.	L2
BP408P Pharmacology I – Practical	BP408P_CO1	**Describe** basic instruments used in experimental pharmacology and follow CPSEA guidelines.	L2
	BP408P_CO2	**Describe** the use of experimental animals and models in the new drug development system.	L2
	BP408P_CO3	**Describe** various anesthetics, blood withdrawal techniques, and routes of drug administration in laboratory animals.	L2
	BP408P_CO4	**Understand** the mechanism of action, therapeutic uses, and toxicity of drugs.	L2, L5
BP409P Pharmacognosy and Phytochemistry I – Practical	BP409P_CO1	**Analyze** crude drugs by chemical tests and morphological characters.	L4
	BP409P_CO2	**Understand** methods of leaf constants for standardization.	L2, L5
	BP409P_CO3	**Understand** techniques of drug evaluation and extraction processes.	L2, L5
	BP409P_CO4	**Study** drug evaluation techniques and moisture content.	L3, L4

B. Pharm III (Semester-V)			
BP501T Medicinal Chemistry II - Theory	BP501T_CO1	**Understand** the chemistry of drugs in relation to their pharmacological activity.	L2, L5
	BP501T_CO2	**Write** classifications, metabolic pathways, adverse effects, and therapeutic uses of different classes of drugs.	L6
	BP501T_CO3	**Explain** the structure-activity relationship of a selective class of drugs.	L2, L5
	BP501T_CO4	**Acquire** knowledge about the mechanism of action of different classes of medicinal compounds.	L1, L3
	BP501T_CO5	**Outline** the synthesis of a selective class of medicinal drugs.	L2
BP502T Industrial Pharmacy I - Theory	BP502T_CO1	**Study** and understand the basic concepts and rationale of developing various pharmaceutical dosage forms.	L3, L4
	BP502T_CO2	**Detail** the manufacturing procedures of dosage forms.	L4
	BP502T_CO3	**Study** various equipment and instruments, along with modern tools used in the manufacturing of dosage forms.	L3, L4
	BP502T_CO4	**Illustrate** processing problems and their remedies in the development and manufacturing of dosage forms.	L2
	BP502T_CO5	**Evaluate** the quality control testing of dosage forms.	L5
	BP502T_CO6	**Understand** the applications of various dosage forms.	L2, L5
BP503T Pharmacology II - Theory	BP503T_CO1	**Understand** the mechanism of drug action and its relevance in the treatment of different diseases.	L2, L5
	BP503T_CO2	**Explain** pharmacokinetics, adverse drug reactions (ADR), and dosage of drugs.	L2, L5
	BP503T_CO3	**Understand** therapeutic uses and dosage regimens for disease treatment.	L2, L5
	BP503T_CO4	**Appreciate** newer targets for several disease conditions in treatment.	L3
BP504T Pharmacognosy and Phytochemistry II - Theory	BP504T_CO1	**Understand** modern extraction techniques, characterization, and identification of herbal drugs and phytoconstituents.	L2, L5
	BP504T_CO2	**Understand** the preparation and development of herbal formulations.	L2, L5
	BP504T_CO3	**Understand** herbal drug interactions.	L2, L5
	BP504T_CO4	**Carryout** the isolation and identification of phytoconstituents.	L2, L3
BP505T Pharmaceutical Jurisprudence - Theory	BP505T_CO1	**Comprehend** and understand pharmaceutical legislations and their implications in the pharmacy profession.	L2, L5
	BP505T_CO2	**Know** the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals, the regulatory approval process, and registration in Indian and international markets.	L1, L3
	BP505T_CO3	**Understand** various Indian pharmaceutical Acts and Laws and the code of ethics during pharmaceutical practice.	L2, L5

BP506P Industrial Pharmacy I - Practical	BP506P_CO1	**Perform** pre-formulation studies on the given sample of a drug.	L3
	BP506P_CO2	**Manufacture** given dosage forms (Tablet, Capsule, Injection, Cream, etc.).	L6
	BP506P_CO3	**Evaluate** the manufactured dosage form.	L5
	BP506P_CO4	**Evaluate** marketed dosage forms.	L5
	BP506P_CO5	**Evaluate** packaging material (e.g., Glass).	L5
BP507P Pharmacology II - Practical	BP507P_CO1	**Demonstrate** the isolation of different organs/tissues from laboratory animals through simulated experiments.	L2
	BP507P_CO2	**Demonstrate** various receptor actions using isolated tissue preparation.	L2
	BP507P_CO3	**Understand** the mechanism of drug action and its relevance in the treatment of different diseases.	L2, L5
	BP507P_CO4	**Appreciate** the correlation of pharmacology with related medical sciences.	L3
BP508P Pharmacognosy and Phytochemistry II - Practical	BP508P_CO1	**Understand** the morphology and microscopy of crude drugs, along with powder characteristics.	L2, L5
	BP508P_CO2	**Understand** identification, extraction, and isolation techniques.	L2, L5
	BP508P_CO3	**Learn** the isolation of chemical constituents by modern methods.	L3
	BP508P_CO4	**Gain** knowledge of the identification and standardization of crude drugs through chemical tests.	L1
B. Pharm III (Semester-VI)			
BP601T Medicinal Chemistry III - Theory	BP601T_CO1	**Study** the development and classification of medicinal agents based on the chemical nature of drugs.	L3, L4
	BP601T_CO2	**Draw** the structure, write the chemical name, and outline the synthetic procedure of drugs.	L6
	BP601T_CO3	**Relate** the knowledge of the chemistry of drugs of specified categories with respect to their application.	L1, L2
	BP601T_CO4	**Explain** the Structural Activity Relationship (SAR) of various classes of drugs.	L2, L5
	BP601T_CO5	**Describe** the importance of drug design and various techniques like CADD, QSAR, and Molecular modeling.	L2
	BP601T_CO6	**Outline** different strategies and applications of Combinatorial Chemistry.	L2
BP602T Pharmacology III - Theory	BP602T_CO1	**Study** the pharmacology and pharmacotherapy of various drugs acting on the respiratory system and gastrointestinal tract.	L3, L4
	BP602T_CO2	**Understand** the mechanism of drug action and its relevance in the treatment of different infectious diseases.	L2, L5
	BP602T_CO3	**Understand** the pharmacology of chemotherapy.	L2, L5
	BP602T_CO4	**Study** details of immunopharmacology, toxicology, and chrono pharmacology.	L3, L4
	BP602T_CO5	**Appreciate** the correlation of pharmacology with related medical sciences.	L3

BP603T Herbal Drug Technology - Theory	BP603T_CO1	**Understand** raw materials as a source of herbal drugs from cultivation to herbal drug product.	L2, L5
	BP603T_CO2	**Know** the WHO and ICH guidelines for the evaluation of herbal drugs.	L1, L3
	BP603T_CO3	**Understand** herbal cosmetics, natural sweeteners, and nutraceuticals.	L2, L5
	BP603T_CO4	**Appreciate** the patenting of herbal drugs and Good Manufacturing Practices (GMP).	L3
BP604T Biopharmaceutics and Pharmacokinetics - Theory	BP603T_CO1	**Understand** basic concepts in biopharmaceutics and pharmacokinetics and their significance.	L2, L5
	BP604T_CO2	**Use** plasma drug concentration-time data to calculate pharmacokinetic parameters describing the kinetics of drug absorption, distribution, metabolism, excretion, and elimination.	L3
	BP604T_CO3	**Understand** the concept of bioavailability and bioequivalence of drug products and their significance.	L2, L5
	BP604T_CO4	**Understand** various pharmacokinetic parameters, their significance, and applications.	L2, L5
	BP604T_CO5	**Impart** knowledge and skills of biopharmaceutics and pharmacokinetics and their applications in pharmaceutical development.	L3
BP605T Pharmaceutical Biotechnology - Theory	BP605T_CO1	**Understand** the importance of immobilized enzymes in pharmaceutical industries.	L2, L5
	BP605T_CO2	**Instructed** about genetic engineering applications in relation to the production of pharmaceuticals.	L2, L3
	BP605T_CO3	**Given** information about the importance of monoclonal antibodies in industries.	L1, L3
	BP605T_CO4	**Appreciate** the use of microorganisms in fermentation technology.	L3
	BP605T_CO5	**Describe** various blood products, plasma collection, and processing.	L2
	BP605T_CO6	**Discuss** the principles of fermentation, its design, and the production of pharmaceutical products.	L6
BP606T Quality Assurance - Theory	BP606T_CO1	**Understand** the responsibilities of QA and QC departments.	L2, L5
	BP606T_CO2	**Understand** the scope of quality certifications applicable to pharmaceutical industries.	L2, L5
	BP606T_CO3	**Understand** cGMP aspects in a pharmaceutical industry.	L2, L5
	BP606T_CO4	**Understand** the GLP aspect in the pharmaceutical industry.	L2, L5
	BP606T_CO5	**Appreciate** the importance of documentation.	L3
BP607P Medicinal Chemistry III - Practical	BP607P_CO1	**Prepare** medicinally important compounds/intermediates.	L3
	BP607P_CO2	**Explain** the physicochemical properties of drugs using drug design software.	L2, L5
	BP607P_CO3	**Draw** chemical structures and reactions using ChemDraw software.	L6
	BP607P_CO4	**Analyze** the purity of medicinal compounds.	L4
BP608P Pharmacology III	BP608P_CO1	**Understand** the basic principle of bioassay and types of bioassay.	L2, L5

- Practical	BP608P_CO2	**Demonstrate** the isolation of different organs/tissues from laboratory animals through simulated experiments.	L2
	BP608P_CO3	**Understand** the effect of different drugs on concentration-response curves.	L2, L5
	BP608P_CO4	**Demonstrate** various receptor actions using isolated tissue preparation.	L2
BP609P Herbal Drug Technology - Practical	BP609P_CO1	**Understand** raw materials as a source of herbal drugs from cultivation to herbal drug product.	L2, L5
	BP609P_CO2	**Know** the WHO and ICH guidelines for the evaluation of herbal drugs.	L1, L3
	BP609P_CO3	**Understand** herbal cosmetics, natural sweeteners, and nutraceuticals.	L2, L5
	BP609P_CO4	**Appreciate** patenting of herbal drugs and Good Manufacturing Practices (GMP).	L3
B. Pharm IV (Semester-VII)			
BP701T Instrumental Methods of Analysis - Theory	BP701T_CO1	**Gain** brief knowledge about the electromagnetic spectrum and its interaction with matter.	L1
	BP701T_CO2	**Explain** the principles, instrumentation, and applications of UV-Visible and IR spectroscopy.	L2, L5
	BP701T_CO3	**Recall** and explain the principles, instrumentation, and applications of Fluorimetry.	L1
	BP701T_CO4	**Describe** the principles, instrumentation, and applications of Flame Photometry, Atomic Absorption Spectroscopy, and Nepheloturbidometry Techniques.	L2
	BP701T_CO5	**Understand** the chromatographic separation and analysis of drugs.	L2, L5
BP702T Industrial Pharmacy II - Theory	BP702T_CO1	**Detail** the process of pilot plant scale-up of pharmaceutical dosage forms.	L4
	BP702T_CO2	**Demonstrate** the practice and process of technology transfer from lab scale to commercial.	L2
	BP702T_CO3	**Detail** different laws and acts that regulate the pharmaceutical industry.	L4
	BP702T_CO4	**Describe** the approval process and regulatory requirements of drug products.	L2
	BP702T_CO5	**Describe** the role and responsibility of regulatory agencies in the approval of drugs; understand the organization and responsibilities of national and state licensing authorities.	L2
BP703T Pharmacy Practice - Theory	BP703T_CO1	**Understand** various drug distribution methods in a hospital.	L2, L5
	BP703T_CO2	**Appreciate** pharmacy stores management and inventory control.	L3
	BP703T_CO3	**Monitor** drug therapy of patients through medication chart review and clinical review; obtain medication history, interview, and counsel patients.	L5
	BP703T_CO4	**Identify** drug-related problems and detect/assess adverse drug reactions.	L3
	BP703T_CO5	**Know** pharmaceutical care services and perform patient counseling in community pharmacy.	L1, L3

	BP703T_CO6	**Appreciate** the concept of rational drug therapy.	L3
BP704T Novel Drug Delivery System - Theory	BP704T_CO1	**Understand** various approaches for the development of novel drug delivery systems.	L2, L5
	BP704T_CO2	**Understand** the criteria for the selection of drugs and polymers for the development of novel drug delivery systems.	L2, L5
	BP704T_CO3	**Formulate** and evaluate various novel drug delivery systems.	L6
	BP704T_CO4	**Know** about current developments in drug delivery technologies.	L1, L3
BP705P Instrumental Methods of Analysis - Practical	BP705P_CO1	**Understand** appropriate safety measures while handling instruments, chemicals, and apparatus.	L2, L5
	BP705P_CO2	**Apply** the basic principles of various spectroscopic techniques in the analysis of drugs using various instruments.	L3
	BP705P_CO3	**Acquire** knowledge for processing and interpreting data obtained through experimentation and report the results as per regulatory requirements.	L1, L3
	BP705P_CO4	**Perform** quantitative and qualitative analysis of drugs using various analytical instruments.	L3
BP706PS Practice School - Theory	BP706P_CO1	**Know** various drug distribution methods in a hospital.	L1, L3
	BP706P_CO2	**Appreciate** pharmacy stores management and inventory control.	L3
	BP706P_CO3	**Monitor** drug therapy of patients through medication chart review and clinical review; obtain medication history, interview, and counsel patients.	L5
	BP706P_CO4	**Identify** drug-related problems and detect/assess adverse drug reactions.	L3
	BP706P_CO5	**Know** pharmaceutical care services and perform patient counseling in community pharmacy.	L1, L3
	BP706P_CO6	**Appreciate** the concept of rational drug therapy.	L3
B. Pharm IV (Semester-VIII)			
BP801T Biostatistics and Research Methodology - Theory	BP801T_CO1	**Understand** the fundamental concepts of biostatistics and research methodology.	L2, L5
	BP801T_CO2	**Apply** statistical methods to analyze and interpret research data.	L3
	BP801T_CO3	**Design** and conduct research studies, incorporating appropriate statistical tools.	L6
	BP801T_CO4	**Develop** skills in critically evaluating research literature.	L3, L6
BP802T Social and Preventive Pharmacy - Theory	BP802T_CO1	**Recognize** the concepts and principles of public health.	L1
	BP802T_CO2	**Relate** food to nutritional health, balanced diet, deficiencies, and their prevention.	L1, L2
	BP802T_CO3	**Illustrate** sociocultural factors and their relation to health.	L2
	BP802T_CO4	**Identify** avoidable habits for personal hygiene and health.	L3
	BP802T_CO5	**Explain** the principles of the prevention and control of communicable and non-communicable diseases.	L2, L5

	BP802T_CO6	**Provide** a brief overview of national health programs, their objectives, functioning, and outcomes.	L3
	BP802T_CO7	**Recognize** community services in rural, urban, and school health.	L1
	BP802T_CO8	**Explain** general measures and strategies to be followed in social and preventive pharmacy.	L2, L5
BP804ET Pharmaceutical Regulatory Science - Theory	BP804ET_CO1	**Understand** the process of drug discovery, development, and generic product development.	L2, L5
	BP804ET_CO2	**Describe** the regulatory approval process and registration procedures for APIs and drug products in various countries.	L2
	BP804ET_CO3	**Understand** the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals.	L2, L5
	BP804ET_CO4	**Understand** the development of clinical trial protocols.	L2, L5
	BP804ET_CO5	**Learn** the basic importance of the Orange Book, Federal Register, Code of Federal Regulations, and Purple Book.	L3
	BP804ET_CO6	**Detail** the registration process of Indian drug products in overseas markets.	L4
BP809ET Cosmetic Science - Theory	BP809ET_CO1	**Understand** the principles of formulation and the building blocks of various skin and hair care products.	L2, L5
	BP809ET_CO2	**Explore** the factors influencing cosmetic product development and formulation.	L2, L5
	BP809ET_CO3	**Analyze** the safety and regulatory aspects associated with cosmetic products.	L4
	BP809ET_CO4	**Understand** the basic principles and techniques of cosmetic product testing.	L2, L5
	BP809ET_CO5	**Appreciate** the significance of quality control and assurance in cosmetic	L3

Channabasweshwar Pharmacy College (Degree) LATUR

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Course Outcomes

PROGRAMME: Pharm D

Name of Subject with Code	CO Code	Course Outcomes	Bloom's Level
Pharm D I			
1.1 Human Anatomy and Physiology - Theory	**PD1.1T_CO1**	**Describe** the structure (gross and histology) and functions of various organs of the human body	L2
	PD1.1T_CO2	**Describe** the various homeostatic mechanisms and their imbalances of various systems	L2
	PD1.1T_CO3	**Identify** the various tissues, bones, and organs of the different systems of the human body	L3
	PD1.1T_CO4	**Perform** hematological tests and record blood pressure, heart rate, pulse, and respiratory volumes	L3
	PD1.1T_CO5	**Recognize** the coordinated working pattern of different organs of each system	L1
	PD1.1T_CO6	**Appreciate** the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of the human body	L3
1.2 Pharmaceutics - Theory	**PD1.2T_CO1**	**Impart** fundamental knowledge on the science of formulating different dosage forms	L3
	PD1.2T_CO2	**Study** different pharmaceutical calculations involved in formulation	L3, L4
	PD1.2T_CO3	**Study** the basic formulation preparations of dosage forms	L3, L4
	PD1.2T_CO4	**Study** classifications, evaluations, applications of various dosage forms	L3, L4
	PD1.2T_CO5	**Know** about historical developments, pharmacopoeia developments, and drug-related incompatibilities	L1, L3
1.3 Medicinal Biochemistry - Theory	**PD1.3T_CO1**	**Demonstrate** the biological role of Biomolecule, enzymes, concept of Bioenergetics, and Genetic Code	L2
	PD1.3T_CO2	**Demonstrate** the normal Carbohydrate, Amino acid, Protein, Lipid, and Nucleic acid Metabolism	L2
	PD1.3T_CO3	**Identify** the effect of abnormal metabolism of Carbohydrate, Amino acid, Protein, Lipid, and Nucleic acid	L3
	PD1.3T_CO4	**Describe** the role enzymes, electrolytes, biomolecules used in the diagnosis of various disorders	L2
	PD1.3T_CO5	**Choose** different types of tests used to assess the normal and abnormal physiology of various organs	L1, L3, L5, L6

	PD1.3T_CO6	**Interpret** the results of tests used to assess the normal and abnormal physiology of various organs	L2, L5
1.4 Pharmaceutical Organic Chemistry - Theory	**PD1.4T_CO1**	**Acquire** the knowledge of different reactions, mechanisms, orientation, and stereochemistry of different organic compounds	L1, L3
	PD1.4T_CO2	**Understand** concepts of different rearrangement reactions and mechanisms in organic chemistry	L2, L5
	PD1.4T_CO3	**Understand** the basic concepts in chemistry, including different types of orientation rules, resonance theory, nomenclature, acid-base theories, isomerism, etc	L2, L5
	PD1.4T_CO4	**Gain** knowledge of different methods of preparation of organic compounds, test for purity, assay, and medicinal uses	L1
1.5 Pharmaceutical Inorganic Chemistry - Theory	**PD1.5T_CO1**	**Understand** the principles of volumetric analysis	L2, L5
	PD1.5T_CO2	**Instruct** the fundamental methodology to prepare different strengths of solutions	L3
	PD1.5T_CO3	**Predict** the sources of mistakes and errors in Pharmaceutical inorganics	L6
	PD1.5T_CO4	**Understand** the principles of limit tests, know the sources of impurities, and methods to determine the impurities in inorganic drugs and pharmaceuticals	L2, L5
	PD1.5T_CO5	**Understand** the medicinal and pharmaceutical importance of inorganic compounds, be introduced to a variety of inorganic drug classes	L2, L5
1.6 Remedial Biology - Theory	**PD1.6T_CO1**	**Study** the classification and salient features of the five kingdoms of life.	L3, L4
	PD1.6T_CO2	**Understand** the basic components of anatomy & physiology of plants with a special reference to humans.	L2, L5
	PD1.6T_CO3	**Understand** the basic components of anatomy & physiology of animals, with a special reference to humans.	L2, L5
	PD1.6T_CO4	**Apply** knowledge to learn and understand the components of the living world, structure, and functional systems of the plant and animal kingdom.	L3
1.6 Remedial Mathematics – Theory	**PD1.6T_CO1**	**Recall** and demonstrate fundamental mathematical concepts and operations.	L1
	PD1.6T_CO2	**Understand** the principles and applications of basic mathematical operations, including arithmetic, algebra, and geometry.	L2, L5
	PD1.6T_CO3	**Apply** mathematical concepts to solve real-world problems and scenarios.	L3
	PD1.6T_CO4	**Analyze** and interpret mathematical data, recognizing patterns and relationships.	L4
	PD1.6T_CO5	**Evaluate** mathematical solutions for accuracy and relevance in specific contexts.	L5
	PD1.6T_CO6	**Develop** problem-solving strategies and methods for approaching mathematical challenges.	L3, L6

	PD1.6T_CO7	**Applying** Mathematical Skills: Apply mathematical skills to other academic disciplines and practical situations.	L3
Human Anatomy and Physiology [Practical]	**PD1.1P_CO1**	**Describe** the anatomy of important physiological systems including the cardiorespiratory, renal, reproductive, and metabolic systems	L2
	PD1.1P_CO2	**Understand** the functions of important physiological systems including the cardiorespiratory, renal, reproductive, and metabolic systems	L2, L5
	PD1.1P_CO3	**Recognize** and identify principal tissue structures of the human body	L1
	PD1.1P_CO4	**Identify** the different types of bones in the human body	L3
	PD1.1P_CO5	**Describe** the various homeostatic mechanisms and their imbalances	L2
	PD1.1P_CO6	**Perform** the sciatic nerve isolation and evaluate various factors effect on sciatic nerve preparation	L3
Pharmaceutics [Practical]	**PD1.2P_CO1**	**Formulate** various solid and liquid dosage forms	L6
	PD1.2P_CO2	**Demonstrate** different techniques involved in formulation	L2
	PD1.2P_CO3	**Identify** and apply suitable remedial measures to solve instabilities observed in formulations	L3
	PD1.2P_CO4	**Prepare** appropriate labels for dosage forms	L3
	PD1.2P_CO5	**Conduct** planned experiments and prepare a laboratory report in a standard format	L3
Medicinal Biochemistry [Practical]	**PD1.3P_CO1**	**Acquire** knowledge in qualitative and quantitative estimation of biological macromolecules	L1, L3
	PD1.3P_CO2	**Develop** practical and transferable skills necessary for careers in research, teaching, Medicine, and professions allied to Medicine and industry	L3, L6
	PD1.3P_CO3	**Study** techniques and instrumentation used to investigate/assess health and disease	L3, L4
	PD1.3P_CO4	**Critically** evaluate the concepts, techniques, and applications of Physiology	L5
	PD1.3P_CO5	**Perform** pertinent laboratory experiments, record observations, analyze data, and present the results in written form	L3
Pharmaceutical Organic Chemistry [Practical]	**PD1.4P_CO1**	**Practice** the synthesis of various organic compounds by different chemical reactions	L3
	PD1.4P_CO2	**Practice** purifying organic compounds using various procedures like recrystallization and steam distillation	L3
	PD1.4P_CO3	**Practice** calculating the percentage yields of the products obtained by synthesis	L3
	PD1.4P_CO4	**Perform** recrystallization and steam distillation methods for the purification of synthesized organic compounds	L3
	PD1.4P_CO5	**Practice** detecting the extra elements present in compounds	L3

	PD1.4P_CO6	**Train** to identify organic compounds by systematic qualitative analysis	#N/A
	PD1.4P_CO7	**Practice** the determination of the boiling point/melting point of organic compounds	L3
	PD1.4P_CO8	**Practice** constructing molecular models of compounds using atomic models sets	L3
Pharmaceutical Inorganic Chemistry [Practical]	**PD1.5P_CO1**	**Adjudge** the level of specific impurities in given inorganic compounds by performing different limit tests	L5
	PD1.5P_CO2	**Prepare** primary and secondary standard solutions, determine the percentage purity of given pharmaceutical drugs by titrimetric analysis	L3
	PD1.5P_CO3	**Identify** a mixture of inorganic compounds by systematic qualitative analysis	L3
	PD1.5P_CO4	**Perform** identification tests as per the Indian Pharmacopoeia	L3
	PD1.5P_CO5	**Determine** impurities qualitatively by performing tests for purity	L5
	PD1.5P_CO6	**Use** different chemical methods to prepare inorganic pharmaceuticals	L3
Remedial Biology [Practical]	**PD1.6P_CO1**	**Identify** and classify organisms based on their characteristics and salient features within the five kingdoms of life.	L3
	PD1.6P_CO2	**Observe** and analyze the basic components of plant anatomy and physiology.	L2, L3, L5
	PD1.6P_CO3	**Understand** the fundamental components of animal anatomy and physiology, with a special focus on human biology.	L2, L5
	PD1.6P_CO4	**Apply** knowledge of the components of the living world to comprehend the structure and functional systems of plant and animal kingdoms.	L3
	PD1.6P_CO5	**Analyze** and interpret experimental data related to biological concepts.	L4
	PD1.6P_CO6	**Perform** experiments related to classification, anatomy, and physiology to reinforce theoretical knowledge.	L3
	PD1.6P_CO7	**Apply** biological concepts learned in theory to practical situations and scenarios.	L3
	PD1.6P_CO8	**Engage** in problem-solving exercises that require the application of biological principles.	L3
Pharm D II			
2.1 Pathophysiology - Theory	**PD2.1T_CO1**	**Explain** the pathogenesis and morphology of reversible and irreversible cell injury; enumerate various lipoproteins and describe lipoprotein disorders	L2, L5
	PD2.1T_CO2	**Illustrate** the events involved in acute and chronic inflammation	L2
	PD2.1T_CO3	**Recognize** the biological significance of various hypersensitivity disorders	L1

	PD2.1T_CO4	**Discuss** the mechanisms involved in autoimmune diseases and allograft rejection	L6
	PD2.1T_CO5	**Discuss** the etiopathogenesis of selected diseases	L6
	PD2.1T_CO6	**Describe** the general biology of cancer, mechanisms of shock, and effects of radiation exposure	L2
2.2 Pharmaceutical Microbiology - Theory	**PD2.2T_CO1**	**Understand** the basic concept of microbiology, scope of microbiology, and classification of microorganisms	L2, L5
	PD2.2T_CO2	**Acquire** knowledge about nutritional requirements for microorganisms and cultural media for bacteria	L1, L3
	PD2.2T_CO3	**Demonstrate** isolation and identification of microbes	L2
	PD2.2T_CO4	**Study** microbial movement, sterilization methods	L3, L4
	PD2.2T_CO5	**Perform** sterility testing of different components and diagnostic tests for diseases	L3
	PD2.2T_CO6	**Know** and remember different disinfectant agents, study immunology and infectious diseases	L1, L3
2.3 Pharmacognosy and Phytopharmaceuticals - Theory	**PD2.3T_CO1**	**Understand** the basics of Pharmacognosy, including the cell	L2, L5
	PD2.3T_CO2	**Understand** the basic principles of cultivation, collection, and storage of crude drugs	L2, L5
	PD2.3T_CO3	**Know** the source, active constituents, uses, and evaluation of crude drugs	L1, L3
	PD2.3T_CO4	**Appreciate** the applications of primary and secondary metabolites of the plant	L3
2.4 Pharmacology-I - Theory	**PD2.4T_CO1**	**Learn** about different drugs used with an emphasis on their classification, pharmacodynamic and pharmacokinetic aspects, adverse effects, and therapeutic uses	L3
	PD2.4T_CO2	**Study** dose, route of administration, precautions, and contraindications	L3, L4
	PD2.4T_CO3	**Appreciate** the importance of drug discovery by preclinical and clinical trials & the importance of pharmacology subject as a basis for therapeutics	L3
	PD2.4T_CO4	**Apply** the knowledge of drugs and their detailed description therapeutically in clinical case scenarios	L3
2.5 Community Pharmacy - Theory	**PD2.5T_CO1**	**Describe** business and professional practice management skills in community pharmacies	L2
	PD2.5T_CO2	**Provide** patient counseling & health screening services to the public in community pharmacy	L3
	PD2.5T_CO3	**Understand** minor ailments and provide appropriate medication with pharmaceutical care services	L2, L5
	PD2.5T_CO4	**Appreciate** the concept of rational drug therapy	L3
2.6 Pharmacotherapeutics I - Regular - Theory	**PD2.6T_CO1**	**Understand** the pathophysiology of selected disease states and the rationale for drug therapy	L2, L5
	PD2.6T_CO2	**Understand** the therapeutic approach to the management of these diseases	L2, L5
	PD2.6T_CO3	**Understand** the controversies in drug therapy	L2, L5
	PD2.6T_CO4	**Understand** the importance of preparation of individualized therapeutic plans based on diagnosis	L2, L5

	PD2.6T_CO5	**Identify** patient-specific parameters relevant to initiating drug therapy	L3
	PD2.6T_CO6	**Monitor** therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects)	L5
	PD2.6T_CO7	**Monitor** therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects)	L5
Pharmaceutical Microbiology - Practical	**PD2.2P_CO1**	**Acquire** and demonstrate competency in laboratory safety and routine and specialized microbiological laboratory skills applicable to microbiological research or clinical methods, including accurately reporting observations and analysis	L1, L3
	PD2.2P_CO2	**Study** microbial experimental apparatus, different staining techniques	L3, L4
	PD2.2P_CO3	**Demonstrate** isolation and identification of microbes	L2
	PD2.2P_CO4	**Understand** different biochemical testing and diagnostic testing	L2, L5
Pharmacognosy and Phytopharmaceuticals - Practical	**PD2.3P_CO1**	**Understand** the basics of the Pharmacognosy Laboratory and cell	L2, L5
	PD2.3P_CO2	**Identify** crude drugs through their morphological, histological characteristics	L3
	PD2.3P_CO3	**Evaluate** crude drugs by determining various values and physical and chemical tests	L5
Pharmacology-I - Practical	**PD2.4P_CO1**	**Describe** the basic instruments used in experimental pharmacology	L2
	PD2.4P_CO2	**Prepare** various physiological salt solutions and different drug solutions for screening of drug activity	L3
	PD2.4P_CO3	**Describe** the use of experimental animals and models in the new drug development system	L2
	PD2.4P_CO4	**Describe** the application of different types of bioassays in the determination of the effective concentration of drugs	L2
	PD2.4P_CO5	**Describe** various anesthetics and routes of drug administration in laboratory animals	L2
Pharmacotherapeutics I - Regular - Practical	**PD2.6P_CO1**	**Practice** to understand the pathophysiology of selected disease states and the rationale for drug therapy	L3
	PD2.6P_CO2	**Practice** to understand the therapeutic approach to the management of these diseases	L3
	PD2.6P_CO3	**Practice** to understand the controversies in drug therapy	L3
	PD2.6P_CO4	**understand** the importance of preparation of individualized therapeutic plans based on diagnosis	L2, L5
	PD2.6P_CO5	**Practice** to identify patient-specific parameters relevant to initiating drug therapy	L3
	PD2.6P_CO6	**Assess** therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects)	L5

Pharm D III			
3.1 Pharmacology II - Regular - Theory	**PD3.1T_CO1**	**Apply** the knowledge of the pharmacology of drugs acting on the Hemopoietic system and Renal System	L3
	PD3.1T_CO2	**Find** the new updates and problems associated with the drugs acting as chemotherapeutic agents	L1
	PD3.1T_CO3	**Explain** the importance of animal toxicology and Immunopharmacology	L2, L5
	PD3.1T_CO4	**Develop** knowledge on cells, macromolecules, Chromosomes, DNA Replication & cell cycle, and cell signaling in the future field of personalized medicine	L3, L6
	PD3.1T_CO5	**Analyze** the gene structure, gene expression, transcription factors, and recombinant DNA technology	L4
3.2 Pharmaceutical Analysis - Theory	**PD3.2T_CO1**	**Understand** the basic knowledge and fundamentals of analytical chemistry and principles of Electrochemical analysis of drugs	L2, L5
	PD3.2T_CO2	**Understand** the principles of volumetric and electrochemical analysis	L2, L5
	PD3.2T_CO3	**Understand** the basic principles of Chromatography, Spectroscopy, and Electrometric Methods	L2, L5
	PD3.2T_CO4	**Understand** Conductometry, Potentiometry, and Amperometric Titrations	L2, L5
	PD3.2T_CO5	**Develop** analytical skills	L3, L6
3.3 Pharmacotherapeutics II - Regular - Theory	**PD3.3T_CO1**	**Understand** the pathophysiology of selected disease states and the rationale for drug therapy	L2, L5
	PD3.3T_CO2	**Understand** the therapeutic approach to the management of diseases	L2, L5
	PD3.3T_CO3	**Understand** controversies in drug therapy	L2, L5
	PD3.3T_CO4	**Understand** the importance of preparing individualized therapeutic plans based on diagnosis	L2, L5
	PD3.3T_CO5	**Appreciate** the need to identify patient-specific parameters relevant to initiating drug therapy and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects)	L3
3.4 Pharmaceutical Jurisprudence - Theory	**PD3.4T_CO1**	**Understand** and practice Professional ethics; comprehend various concepts of pharmaceutical legislation in India	L2, L5
	PD3.4T_CO2	**Know** the various parameters in the Drug and Cosmetic Act and rules; understand Drug policy, DPCO, Patent and design act	L1, L3
	PD3.4T_CO3	**Understand** labeling requirements and packaging guidelines for drugs and cosmetics	L2, L5
	PD3.4T_CO4	**Understand** the concepts of Dangerous Drugs Act, Pharmacy Act, and Excise duties Act	L2, L5
	PD3.4T_CO5	**Understand** other laws as prescribed by the Pharmacy Council of India from time to time, including International Laws	L2, L5

3.5 Medicinal Chemistry - Theory	**PD3.5T_CO1**	**Understand** the chemistry of drugs with respect to their pharmacological activity	L2, L5
	PD3.5T_CO2	**Write** classifications, metabolic pathways, adverse effects, and therapeutic uses of different classes of drugs	L6
	PD3.5T_CO3	**Explain** the structure-activity relationship of a selective class of drugs	L2, L5
	PD3.5T_CO4	**Acquire** knowledge about the mechanism of action of different classes of medicinal compounds	L1, L3
	PD3.5T_CO5	**Outline** the synthesis of a selective class of medicinal drugs	L2
3.6 Pharmaceutical Formulation - Theory	**PD3.6T_CO1**	**Define** various types of pharmaceutical dosage forms and Novel drug delivery systems	L1
	PD3.6T_CO2	**Explain** principles involved in the formulation and evaluation of various pharmaceutical dosage forms with its packaging	L2, L5
	PD3.6T_CO3	**Apply** principles for the preparation of dosage forms with the highest standards	L3
Pharmacology II - Practical	**PD3.1T_CO1**	**Develop** knowledge related to handling laboratory animals, use of anesthetics and routes of administration in animals, physiological salt solution & appliances used in experimental pharmacology	L3, L6
	PD3.1T_CO2	**Evaluate** dose-response curve of drugs using isolated tissue preparation	L5
	PD3.1T_CO3	**Compare** the agonist and antagonistic action of drugs on isolated tissue preparation	L2, L4, L5
	PD3.1T_CO4	**Estimate** the concentration of an unknown sample of drugs using bioassay method on isolated tissue preparation	L5, L6
	PD3.1T_CO5	**Evaluate** in-vivo pharmacological activity & cardiotonic activity using models/isolated preparations	L5
Pharmaceutical Analysis - Practical	**PD3.2T_CO1**	**Understand** appropriate safety measures while handling analytical instruments, equipment, chemicals, and apparatus	L2, L5
	PD3.2T_CO2	**Apply** the basic principle of various spectroscopic techniques in the analysis of drugs by using various instruments	L3
	PD3.2T_CO3	**Acquire** knowledge for processing and interpretation of data obtained through experimentation and report the results as per standards	L1, L3
	PD3.2T_CO4	**Perform** quantitative & qualitative analysis of drugs using various analytical techniques	L3
Pharmacotherapeutics II - Practical	**PD3.3T_CO1**	**Demonstrate** the application of therapeutic concepts in managing various disease states	L2
	PD3.3T_CO2	**Evaluate** the appropriateness of drug therapy based on patient-specific parameters	L5
	PD3.3T_CO3	**Develop** individualized therapeutic plans based on diagnosis and patient characteristics	L3, L6
	PD3.3T_CO4	**Identify** and manage adverse effects promptly	L3

	PD3.3T_CO5	**Apply** evidence-based information to support therapeutic decisions	L3
	PD3.3T_CO6	**Demonstrate** effective communication skills in counseling patients about their drug therapy	L2
	PD3.3T_CO7	**Communicate** effectively with physicians, nurses, and other members of the healthcare team	L1
	PD3.3T_CO8	**Demonstrate** professionalism in interactions with patients and healthcare colleagues	L2
Medicinal Chemistry - Practical	**PD3.5T_CO1**	**Understand** the reactions of important compounds or intermediates required for the synthesis of drugs	L2, L5
	PD3.5T_CO2	**Understand** Monographical analysis of important drugs	L2, L5
	PD3.5T_CO3	**Study** the assays of important drugs from the course content	L3, L4
	PD3.5T_CO4	**Understand** the partition coefficients, dissociation constants, and molar refractivity of compounds for QSAR analysis	L2, L5
	PD3.5T_CO5	**Understand** the basic concept of medicinal chemistry (structure, MOA, uses, principles of synthesis)	L2, L5
Pharmaceutical Formulation - Practical	**PD3.6T_CO1**	**Understand** and apply principles involved in the formulation and evaluation of cosmetic products	L2, L5
	PD3.6T_CO2	**Apply** principles and techniques involved in the formulation of dosage forms	L3
	PD3.6T_CO3	**Assess** the physical and chemical properties of the formulated products	L5
	PD3.6T_CO4	**Interpret** and analyze experimental data obtained during formulation processes	L2, L5
	PD3.6T_CO5	**Apply** principles for the preparation of dosage forms in adherence to quality standards	L3

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Course Outcomes

PROGRAMME: M. Pharm

Name of Subject with Code	CO Code	Course Outcomes	Bloom's Level
M. Pharm I (Semester-I) in Pharmaceutics			
MPH101T Modern Pharmaceutical Analytical Technique - Theory	**MPH101T_CO1**	**Acquire** basic knowledge of the assay of single and multiple component analysis.	**L1, L3**
	MPH101T_CO2	**Develop** fundamental practical skills using instrumentation techniques.	**L3, L6**
	MPH101T_CO3	**Gain** skills in selecting suitable techniques for the analysis of drugs and pharmaceuticals.	**L1**
	MPH101T_CO4	**Apply** theoretical knowledge to various instrumental techniques effectively.	**L3**
	MPH101T_CO5	**Apply** learned knowledge to develop new procedures of their own design.	**L3**
	MPH101T_CO6	**Demonstrate** the ability to compare various methods of analysis and their outcomes for specific applications.	**L2**
MPH102T Drug Delivery System - Theory	**MPH102T_CO1**	**Understand** concepts of dosages like Sustained Release (SR), Controlled Release (CR) Formulations, bioelectric, personalized medicine, 3D printing, and their factors.	**L2, L5**
	MPH102T_CO2	**Acquire** knowledge on principles and fundamentals of Rate Controlled Drug Delivery Systems.	**L1, L3**
	MPH102T_CO3	**Understand** concepts of Gastro-Retentive and Ocular Drug Delivery Systems.	**L2, L5**
	MPH102T_CO4	**Acquire** knowledge on Transdermal Drug Delivery Systems and its barriers.	**L1, L3**
	MPH102T_CO5	**Understand** fundamentals of Protein and Peptide & Vaccine delivery systems.	**L2, L5**
MPH103T Modern Pharmaceutics - Theory	**MPH103T_CO1**	**Understand** the basic concepts of Pre-formulation.	**L2, L5**
	MPH103T_CO2	**Acquire** knowledge on Optimization techniques in Pharmaceutical Formulation.	**L1, L3**
	MPH103T_CO3	**Understand** Validation, cGMP, and Industrial Management.	**L2, L5**
	MPH103T_CO4	**Acquire** knowledge on Compression and compaction.	**L1, L3**
	MPH103T_CO5	**Study** consolidation parameters.	**L3, L4**
MPH104T Regulatory Affairs - Theory	**MPH104T_CO1**	**Understand** the concepts of innovator and generic drugs, drug development process.	**L2, L5**
	MPH104T_CO2	**Study** regulatory guidance and guidelines for filing and approval processes.	**L3, L4**
	MPH104T_CO3	**Prepare** Dossiers and submit them to regulatory	**L3**

		agencies in different countries.	
	MPH104T_CO4	**Study** documentation of post-approval regulatory requirements for drug substance and drug products.	**L3, L4**
	MPH104T_CO5	**Learn** the submission of global documents in CTD/e CTD formats.	**L3**
	MPH104T_CO6	**Study** different clinical trials requirements for approvals and for conducting clinical trials.	**L3, L4**
	MPH104T_CO7	**Gain** brief knowledge about pharmacovigilance and the process of monitoring in clinical trials.	**L1**
	MPH104T_CO8	**Study** various documentation in the pharmaceutical industry.	**L3, L4**
MPH105P Pharmaceutics Practical I - Practical	**MPH105P_CO1**	**Analyze** drugs and their formulations by UV Vis spectrophotometer, HPLC, Gas Chromatography, fluorimetry, and photometry.	**L4**
	MPH105P_CO2	**Formulate** and evaluate sustained-release matrix tablets and study the in-vitro dissolution profile of CR/SR marketed formulations.	**L6**
	MPH105P_CO3	**Formulate** and evaluate novel Drug Delivery Systems (DDS) such as Transdermal DDS, Mucoadhesive DDS, osmotically controlled DDS, Floating DDS, etc.	**L6**
	MPH105P_CO4	**Conduct** Pre-formulation studies of tablets, assess the effect of compressional force, and plot Heckle plot, Higuchi, and Peppa's factors.	**L3**
M. Pharm I (Semester-II) in Pharmaceutics			
MPH201T Molecular Pharmaceutics (Nano Tech and Targeted DDS) - Theory	**MPH201T_CO1**	**Understand** the basic concepts of Targeted Drug Delivery Systems.	**L2, L5**
	MPH201T_CO2	**Study** various Targeting Methods.	**L3, L4**
	MPH201T_CO3	**Learn** about Micro Capsules/Micro Spheres.	**L3**
	MPH201T_CO4	**Discuss** Pulmonary Drug Delivery Systems.	**L6**
	MPH201T_CO5	**Gain** knowledge of Nucleic acid-based therapeutic delivery systems.	**L1**
MPH202T Advanced Biopharmaceutics & Pharmacokinetics - Theory	**MPH202T_CO1**	**Understand** advanced concepts in biopharmaceutics and pharmacokinetics.	**L2, L5**
	MPH202T_CO2	**Analyze** and interpret various drug absorption, distribution, metabolism, and excretion processes.	**L4**
	MPH202T_CO3	**Apply** mathematical models to describe drug concentration-time profiles and pharmacokinetic parameters.	**L3**
	MPH202T_CO4	**Evaluate** factors influencing drug bioavailability and bioequivalence.	**L5**
	MPH202T_CO5	**Demonstrate** knowledge of advanced drug delivery systems and their impact on biopharmaceutical aspects.	**L2**
	MPH202T_CO6	**Critically** assess and predict drug-drug interactions and their consequences on pharmacokinetics.	**L5**
	MPH202T_CO7	**Understand** the principles of population pharmacokinetics and their application in dosage individualization.	**L2, L5**
	MPH202T_CO8	**Analyze** and interpret clinical data related to drug efficacy and safety.	**L4**
MPH203T	**MPH203T_CO1**	**Understand** computer applications in drug	**L2, L5**

Computer Aided Drug Delivery System - Theory		discovery and development, in pharmaceutical research and development.	
	MPH203T_CO2	**Study** computational modeling of drug dispositions, including modeling techniques of drug absorption, distribution, excretion, and permeation.	**L3, L4**
	MPH203T_CO3	**Study** optimization techniques in pharmaceutical formulations.	**L3, L4**
	MPH203T_CO4	**Understand** the use of computers in pre-clinical and clinical development.	**L2, L5**
	MPH203T_CO5	**Study** Artificial Intelligence (AI), Robotics, and Computational fluid dynamics.	**L3, L4**
MPH204T Cosmetic and Cosmeceuticals - Theory	**MPH204T_CO1**	**Understand** basic concepts of Cosmetics - Regulatory.	**L2, L5**
	MPH204T_CO2	**Understand** the concepts of Cosmetics - Biological aspects.	**L2, L5**
	MPH204T_CO3	**Learn** Formulation Building blocks and Perfumes.	**L3**
	MPH204T_CO4	**Study** the Design of cosmeceutical products.	**L3, L4**
	MPH204T_CO5	**Acquire** knowledge of Herbal Cosmetics.	**L1, L3**
MPH205P Pharmaceutics Practical II - Practical	**MPH205P_CO1**	**Formulate** and evaluate novel drug delivery systems such as Alginate beads, liposomes, and nanosomes.	**L6**
	MPH205P_CO2	**Conduct** solubility studies and bioavailability studies of drugs.	**L3**
	MPH205P_CO3	**Perform** formulation data analysis using Design Expert.	**L3**
	MPH205P_CO4	**Develop** and evaluate cosmetic formulations such as creams, shampoo, and toothpaste, etc.	**L3, L6**
M. Pharm II (Semester-III) in Pharmaceutics			
MRM301T Research Methodology and Biostatistics - Theory	**MRM301T_CO1**	**Develop** the ability to apply appropriate research methods, choose a suitable research design, and establish a framework for conducting research projects.	**L3, L6**
	MRM301T_CO2	**Describe** the relevant statistical methods necessary for a specific research design and formulate appropriate research hypotheses for a research project.	**L2**
	MRM301T_CO3	**Develop** the ability to articulate and implement medical ethics, control regulations, cultural considerations, confidentiality, and conflict of interest in research studies.	**L3, L6**
	MRM301T_CO4	**Explain** CPCSEA guidelines, SOPs for laboratory animal facilities, environmental protection, and personnel training in compliance with ethical standards.	**L2, L5**
	_CO5	**Implement** basic principles of medical research while ensuring medical care in accordance with the Declaration of Helsinki.	**L3**
MPH Journal Club [Theory | Regular]	**MPH Journal Club_CO1**	**Develop** the ability to formulate research questions in an answerable form.	**L3, L6**
	MPH Journal Club_CO2	**Discuss** critical appraisal methods for evaluating the validity, significance of results, and clinical applicability of research articles.	**L6**

	MPH Journal Club_CO3	**Conduct** a systematic search in pharmaceutical bibliographic databases to identify relevant articles and compile scientific data using computer software.	**L3**
M. Pharm I (Semester-I) in Pharmaceutical Quality Assurance			
MQA101T Modern Pharmaceutical Analytical Techniques - Theory	**MQA101T_CO1**	**Acquire** foundational knowledge in the assay of single and multiple components in pharmaceutical analysis.	**L1, L3**
	MQA101T_CO2	**Develop** basic practical skills using instrumentation techniques for pharmaceutical analysis.	**L3, L6**
	MQA101T_CO3	**Gain** skills in selecting suitable techniques for the analysis of drugs and pharmaceuticals.	**L1**
	MQA101T_CO4	**Apply** theoretical knowledge on various instrumental techniques effectively.	**L3**
	MQA101T_CO5	**Apply** learned knowledge in developing new procedures of their own design in pharmaceutical analysis.	**L3**
	MQA101T_CO6	**Compare** various methods of analysis and evaluate their outcomes for specific applications.	**L2, L4, L5**
MQA102T Quality Management System - Theory	**MQA102T_CO1**	**Understand** quality parameters and attributes in the pharmaceutical industry.	**L2, L5**
	MQA102T_CO2	**Gain** knowledge of ISO, NABL, and other regulatory agencies, along with their industrial requirements.	**L1**
	MQA102T_CO3	**Understand** customer expectations for quality pharmaceutical products.	**L2, L5**
	MQA102T_CO4	**Acquire** knowledge of quality evaluation of pharmaceuticals.	**L1, L3**
	MQA102T_CO5	**Understand** stability testing of drugs and drug substances.	**L2, L5**
	MQA102T_CO6	**Comprehend** statistical approaches for quality in the pharmaceutical industry.	**L2, L5**
MQA103T Quality Control and Quality Assurance - Theory	**MQA103T_CO1**	**Understand** cGMP aspects in the pharmaceutical industry.	**L2, L5**
	MQA103T_CO2	**Recognize** the importance of documentation in quality control and assurance.	**L1**
	MQA103T_CO3	**Evaluate** the scope of quality certifications applicable to pharmaceutical industries, demonstrating a comprehensive understanding and critical assessment of quality management principles	**L5**
	MQA103T_CO4	**Understand** the responsibilities of QA & QC departments in maintaining quality standards.	**L2, L5**
	MQA103T_CO5	**Learn** about Good Laboratory Practices (GLP) and regulatory affairs.	**L3**
MQA104T Product Development and Technology Transfer - Theory	**MQA104T_CO1**	**Apply** knowledge to develop new procedures in pilot layouts.	**L3**
	MQA104T_CO2	**Understand** concepts and procedures in preformulation studies.	**L2, L5**
	MQA104T_CO3	**Understand** practices and standards in packaging technology.	**L2, L5**
	MQA104T_CO4	**Understand** regulatory requirements in drug	**L2, L5**

		development stages.	
	MQA104T_CO5	**Gain** knowledge about the phases and regulations in technology transfer.	**L1**
MQA105P Pharmaceutical Quality Assurance Practical I - Practical	**MQA105P_CO1**	**Understand** the analysis of various drugs in single and combination dosage forms.	**L2, L5**
	MQA105P_CO2	**Learn** stability testing of drugs and drug substances.	**L3**
	MQA105P_CO3	**Understand** quality control tests for various drugs, dosage forms, and packaging materials.	**L2, L5**
	MQA105P_CO4	**Analyze** and interpret various instruments and case studies in the quality control area, demonstrating comprehension and application of quality control principles	**L4**
M. Pharm I (Semester-II) in Pharmaceutical Quality Assurance			
MQA201T Hazards and Safety Management - Theory	**MQA201T_CO1**	**Understand** the utilization of energy resources to create an eco-friendly industry environment.	**L2, L5**
	MQA201T_CO2	**Develop** the ability to determine, understand, and implement control measures to eliminate or minimize risks.	**L3, L6**
	MQA201T_CO3	**Acquire** knowledge to identify hazards in the work atmosphere.	**L1, L3**
	MQA201T_CO4	**Recognize** and apply control measures to eliminate or minimize risks.	**L1**
	MQA201T_CO5	**Gain** proficiency in the formal process of hazard identification, risk assessment, and control for effective workplace and safety hazard management.	**L1**
	MQA201T_CO6	**Develop** a thorough understanding of the stages of risk assessment.	**L3, L6**
MQA202T Pharmaceutical Validation - Theory	**MQA202T_CO1**	**Study** the scope and government regulations related to validation.	**L3, L4**
	MQA202T_CO2	**Understand** the importance of validation in pharmaceutical processes.	**L2, L5**
	MQA202T_CO3	**Gain** knowledge about the importance of patent and intellectual property rights.	**L1**
	MQA202T_CO4	**Acquire** training in the qualification aspects of analytical instruments	**L1, L3**
	MQA202T_CO5	**Understand** the importance of calibration for various instruments.	**L2, L5**
	MQA202T_CO6	**Comprehend** various validation aspects in the pharmaceutical industry.	**L2, L5**
	MQA202T_CO7	**Gain** knowledge on how validation is conducted for various components, including instrument validation, cleaning validation, and process validation.	**L1**
MQA203T Audits and Regulatory Compliance - Theory	**MQA203T_CO1**	**Describe** the importance of auditing in ensuring regulatory compliance.	**L2**
	MQA203T_CO2	**Understand** the methodology of auditing in the pharmaceutical industry.	**L2, L5**
	MQA203T_CO3	**Prepare** various audit checklists for conducting audits.	**L3**
	MQA203T_CO4	**Explore** various forms of auditing and understand the audit process.	**L2, L5**

	MQA203T_CO5	**Practice** the auditing process and reporting procedures.	**L3**
MQA204T Pharmaceutical Manufacturing Technology - Theory	**MQA204T_CO1**	**Understand** common practices in pharmaceutical industry development.	**L2, L5**
	MQA204T_CO2	**Comprehend** the practices of aseptic process technology.	**L2, L5**
	MQA204T_CO3	**Understand** the practices of non-sterile manufacturing technology.	**L2, L5**
	MQA204T_CO4	**Understand** the principles and practices of packaging technology, demonstrating comprehension and application in various contexts	**L2, L5**
	MQA204T_CO5	**Understand** principles and implementation of Quality by Design (QbD) in pharmaceutical manufacturing.	**L2, L5**
	MQA204T_CO6	**Understand** principles and implementation of Process Analytical Technology (PAT) in pharmaceutical manufacturing.	**L2, L5**
MQA205P Pharmaceutical Quality Assurance Practical II - Practical	**MQA205P_CO1**	**Understand** the analysis of various drugs in single and combination dosage forms.	**L2, L5**
	MQA205P_CO2	**Understand** equipment qualification in the pharmaceutical industry.	**L2, L5**
	MQA205P_CO3	**Understand** various validation activities in pharmaceuticals.	**L2, L5**
	MQA205P_CO4	**Understand** applications of QbD and PAT in pharmaceutical manufacturing.	**L2, L5**
	MQA205P_CO5	**Understand** checklists for various departments of the pharmaceutical industry.	**L2, L5**
M. Pharm I (Semester-III) in Pharmaceutical Quality Assurance			
MRM301T Research Methodology & Biostatistics - Theory	**MRM301T_CO1**	**Develop** a clear understanding of research concepts.	**L3, L6**
	MRM301T_CO2	**Study** research methodologies in-depth to enhance research skills.	**L3, L4**
	MRM301T_CO3	**Acquire** a comprehensive understanding of biostatistics.	**L1, L3**
	MRM301T_CO4	**Understand** and apply CPCSEA guidelines in the context of research.	**L2, L5**
MQA Journal Club - Theory	**MQA Journal Club_CO1**	**Develop** the ability to formulate research questions in a clear and answerable form.	**L3, L6**
	MQA Journal Club_CO2	**Conduct** critical appraisal of articles, evaluating their validity, significance of results, and clinical applicability.	**L3**
	MQA Journal Club_CO3	**Perform** a systematic search in pharmaceutical bibliographic databases to identify relevant articles and compile scientific data using computer software.	**L3**
M. Pharm I (Semester-I) in Pharmaceutical Chemistry			
MPC101T Modern Pharmaceutical Analytical Techniques - Theory	**MPC101T_CO1**	**Apply** knowledge of chemicals and excipients to make informed decisions in pharmaceutical analysis	**L3**
	MPC101T_CO2	**Evaluate** the accuracy and reliability of analytical results obtained from the analysis of various drugs in single and combination dosage forms	**L5**
	MPC101T_CO3	**Develop** Theoretical and Practical Skills with Analytical Instruments	**L3, L6**

MPC102T Advanced Organic Chemistry - I - Theory	**MPC102T_CO1**	**Understand** and explain the different reactive organic intermediates involved in determining reaction mechanisms.	**L2, L5**
	MPC102T_CO2	**Analyze** and explain nucleophilic uni- and bimolecular (SN1 and SN2) reactions, as well as E1, E2 reactions and their mechanisms.	**L4**
	MPC102T_CO3	**Discuss** the mechanism and applications of various named reactions in organic chemistry.	**L6**
	MPC102T_CO4	**Explain** the applications of various synthetic reagents involved in organic reactions.	**L2, L5**
	MPC102T_CO5	**Understand** various protecting and de-protecting groups used in organic synthesis.	**L2, L5**
	MPC102T_CO6	**Explain** the chemistry, synthesis, and mechanisms of reactions in heterocyclic nuclei.	**L2, L5**
	MPC102T_CO7	**Discuss** the principle and applications of retrosynthesis in organic chemistry.	**L6**
	MPC102T_CO8	**Discuss** the disconnection approach to develop synthetic strategies for small target molecules.	**L6**
MPC103T Advanced Medicinal Chemistry - I - Theory	**MPC103T_CO1**	**Understand** the different stages of drug discovery and the role of medicinal chemistry in drug research.	**L2, L5**
	MPC103T_CO2	**Apply** various strategies to design and develop new drug-like molecules for biological targets and drug receptor concepts.	**L3**
	MPC103T_CO3	**Elaborate** on prodrug development and its applications in medicinal chemistry.	**L6**
	MPC103T_CO4	**Learn** the structural activity relationship (SAR) of important classes of drugs.	**L3**
	MPC103T_CO5	**Explain** types of enzyme inhibition and their applications in medicine.	**L2, L5**
	MPC103T_CO6	**Discuss** peptidomimetics approaches and their applications in drug design.	**L6**
MPC104T Chemistry of Natural Products - Theory	**MPC104T_CO1**	**Explain** the importance of natural compounds as lead molecules for new drug discovery.	**L2, L5**
	MPC104T_CO2	**Learn** the different types, isolation, purification, and characterization of alkaloids, flavonoids, steroids, and terpenoids, and their chemistry and medicinal importance.	**L3**
	MPC104T_CO3	**Understand** molecular modification, biological activity, and general methods of structural determinations of alkaloids.	**L2, L5**
	MPC104T_CO4	**Elaborate** on general methods of structural elucidation and stereochemistry of compounds of natural origin.	**L6**
	MPC104T_CO5	**Explain** the chemistry and physiological significance of vitamins.	**L2, L5**
	MPC104T_CO6	**Discuss** recombinant DNA technology as a tool for new drug discovery.	**L6**
	MPC104T_CO7	**Learn** about constituents present in crude drugs responsible for anti-diabetic activity, liver dysfunction, and antitumor properties.	**L3**
	MPC104T_CO8	**Understand** advanced methods of structural elucidation of compounds of natural origin.	**L2, L5**

MPC105P Pharmaceutical Chemistry Practice - I - Practical	**MPC105P_CO1**	**Analyze** Pharmacopoeia compounds and their formulations using instrumental techniques.	**L4**
	MPC105P_CO2	**Perform** simultaneous analysis of multi-component formulations by UV spectroscopy.	**L3**
	MPC105P_CO3	**Conduct** experiments and estimations based on chromatography, fluorimetry, and flame photometry.	**L3**
	MPC105P_CO4	**Implement** purification techniques on organic solvents, conduct reactions of strategic importance, and demonstrate proficient application of synthetic methods and analytical skills in organic chemistry	**L3**
	MPC105P_CO5	**Apply** advanced synthetic techniques to proficiently carry out the multistep synthesis of pharmaceutically relevant compounds, demonstrating a high level of synthesis and problem-solving skills in organic chemistry	**L3**
	MPC105P_CO6	**Estimate** elements, functional groups of organic natural compounds, and carry out degradation reactions on selected plant constituents.	**L5, L6**
	MPC105P_CO7	**Analyze** the data obtained from isolation and characterization, identifying key parameters and interpreting spectroscopic information	**L4**
M. Pharm I (Semester-II) in Pharmaceutical Chemistry			
MPC201T Advanced Spectral Analysis - Theory	**MPC201T_CO1**	**Interpret** the UV and IR spectra of various organic compounds.	**L2, L5**
	MPC201T_CO2	**Interpret** the NMR spectra of various organic compounds using different techniques.	**L2, L5**
	MPC201T_CO3	**Interpret** the Mass spectra of various organic compounds using different techniques.	**L2, L5**
	MPC201T_CO4	**Understand** the principles, instrumentation, and application of various chromatographic techniques employed for the analysis of organic compounds.	**L2, L5**
	MPC201T_CO5	**Understand** the principles, instrumentation, and application of Thermal methods of analysis, Raman Spectroscopy, and Radioimmune assay.	**L2, L5**
MPC202T Advanced Organic Chemistry-II - Theory	**MPC202T_CO1**	**Understand** the principles of Green chemistry.	**L2, L5**
	MPC202T_CO2	**Explore** the applications of Green chemistry.	**L2, L5**
	MPC202T_CO3	**Apply** knowledge of peptide chemistry to analyze and predict the behavior of peptides in various contexts	**L3**
	MPC202T_CO4	**Study** various catalysts used in organic reactions.	**L3, L4**
	MPC202T_CO5	**Acquire** knowledge of the concept of stereochemistry.	**L1, L3**
	MPC202T_CO6	**Understand** the concept of asymmetric synthesis.	**L2, L5**
MPC203T - Computer Aided Drug Design - Theory	**MPC203T_CO1**	**Demonstrate** a thorough understanding of the historical evolution of Computer-Aided Drug Design, including its basic concepts, and critically assess its contemporary applications.	**L2**
	MPC203T_CO2	**Analyze** and differentiate between the physicochemical properties of compounds, employing both experimental and theoretical methodologies, and interpret the outcomes using QSAR principles.	**L4**

	MPC203T_CO3	**Apply** various methods, including 3D QSAR approaches and statistical techniques, to assess and predict the bioactivity of molecules, emphasizing the importance of statistical parameters in the drug design process.	**L3**
MPC204T - Pharmaceutical Process Chemistry - Theory	**MPC204T_CO1**	**Impart** knowledge on the development and optimization of synthetic routes that are safe, cost-effective, environmentally friendly, and efficient.	**L3**
	MPC204T_CO2	**Describe** the pilot plant procedures for manufacturing Active Pharmaceutical Ingredients (APIs) and new chemical entities, focusing on the scale-up process in drug development.	**L2**
	MPC204T_CO3	**Demonstrate** the ability to perform work-up and separation procedures effectively in pharmaceutical process chemistry.	**L2**
	MPC204T_CO4	**Predict** the outcomes of organic reactions by applying a fundamental understanding of the general reactivity of functional groups and their mechanisms.	**L6**
	MPC204T_CO5	**Understand** industrial safety protocols in pharmaceutical process chemistry.	**L2, L5**
MPC205P - Pharmaceutical Chemistry Practice - II - Practical	**MPC205P_CO1**	**Analyze** pharmacopoeia compounds and their formulations using instrumental techniques and interpret spectroscopic data effectively.	**L4**
	MPC205P_CO2	**Perform** experiments on synthesis, adapting various approaches to gain hands-on experience in medicinal chemistry.	**L3**
	MPC205P_CO3	**Conduct** multistep synthesis of medicinally important compounds, demonstrating proficiency in complex synthetic processes.	**L3**
	MPC205P_CO4	**Understand** the importance of drug design and apply different techniques in the practical setting.	**L2, L5**
M. Pharm II (Semester-III) in Pharmaceutical Chemistry			
MRM301T Research Methodology and Biostatistics - Theory	**MRM301T_CO1**	**Develop** the ability to apply appropriate research methods, choose a suitable research design, and establish a framework for conducting research projects.	**L3, L6**
	MRM301T_CO2	**Describe** the relevant statistical methods necessary for a specific research design and formulate appropriate research hypotheses for a research project.	**L2**
	MRM301T_CO3	**Develop** the ability to articulate and implement medical ethics, control regulations, cultural considerations, confidentiality, and conflict of interest in research studies.	**L3, L6**
	MRM301T_CO4	**Explain** CPCSEA guidelines, SOPs for laboratory animal facilities, environmental protection, and personnel training in compliance with ethical standards.	**L2, L5**
	_CO5	**Implement** basic principles of medical research while ensuring medical care in accordance with the Declaration of Helsinki.	**L3**
MPH Journal Club	**MPH Journal**	**Develop** the ability to formulate research questions	**L3, L6**

[Theory | Regular]	**Club_CO1**	in an answerable form.	
	MPH Journal Club_CO2	**Discuss** critical appraisal methods for evaluating the validity, significance of results, and clinical applicability of research articles.	**L6**
	MPH Journal Club_CO3	**Conduct** a systematic search in pharmaceutical bibliographic databases to identify relevant articles and compile scientific data using computer software.	**L3**
M. Pharm I (Semester-I) in Pharmacology			
MPL101T Modern Pharmaceutical Analytical Techniques - Theory	**MPL101T_CO1**	**Apply** knowledge of chemicals and excipients to make informed decisions in pharmaceutical analysis	**L3**
	MPL101T_CO2	**Evaluate** the accuracy and reliability of analytical results obtained from the analysis of various drugs in single and combination dosage forms	**L5**
	MPL101T_CO3	**Develop** Theoretical and Practical Skills with Analytical Instruments	**L3, L6**
MPL102T Advanced Pharmacology - I - Theory	**MPL102T_CO1**	**Discuss** the pathophysiology of certain diseases.	**L6**
	MPL102T_CO2	**Educate** students about the pharmacotherapy of certain diseases.	**L3**
	MPL102T_CO3	**Explain** the mechanism of drug actions at the cellular and molecular levels.	**L2, L5**
	MPL102T_CO4	**Understand** the adverse effects, contraindications, and clinical uses of drugs used in the treatment of diseases.	**L2, L5**
	MPL102T_CO5	**Impart** recent advances in the drugs used for the treatment of various diseases.	**L3**
MPL103T Pharmacological and Toxicological Screening Methods-I - Theory	**MPL103T_CO1**	**Appraise** regulations and ethical requirements for the usage of experimental animals.	**L5**
	MPL103T_CO2	**Describe** various animals used in the drug discovery process and good laboratory practices in the maintenance and handling of experimental animals.	**L2**
	MPL103T_CO3	**Describe** various newer screening methods involved in the drug discovery process.	**L2**
	MPL103T_CO4	**Appreciate** and correlate preclinical data to humans.	**L3**
	MPL103T_CO5	**Describe** general principles and methods of evaluation of immunoassay.	**L2**
MPL104T Cellular and Molecular Pharmacology - Theory	**MPL104T_CO1**	**Explain** information on the pharmacological modulation of cellular response and receptor signal transduction processes.	**L2, L5**
	MPL104T_CO2	**Educate** students to analyze the molecular and cellular pathways affected by drugs.	**L3**
	MPL104T_CO3	**Recall** the applicability of molecular pharmacology, biomarkers, pharmacogenetics, and pharmacogenomics in the drug discovery process.	**L1**
	MPL104T_CO4	**Demonstrate** genetic elements of DNA, fingerprint analysis, cell culture techniques, and various molecular techniques applicable in drug discovery.	**L2**
MPL105P Pharmacology Practical - I - Practical	**MPL105P_CO1**	**Understand the various routes of drug administration, techniques of blood sampling, anesthesia and euthanasia of experimental animals**	**L2, L5**

	MPL105P_CO2	**Evaluate the effectiveness and efficiency of various screening methods in the context of drug discovery projects**	**L5**
	MPL105P_CO3	**Apply knowledge to execute isolation, identification, and estimation procedures for proteins and DNA/RNA from diverse sources**	**L3**
M. Pharm I (Semester-II) in Pharmacology			
MPL201T Advanced Pharmacology-II Theory	**MPL201T_CO1**	**Assess** the relevance and significance of various pharmacological theories and concepts in the broader context of healthcare and medicine	**L5**
	MPL201T_CO2	**Explore** and comprehend recent advances in drugs used for the treatment of various diseases.	**L2, L5**
	MPL201T_CO3	**Gain** an in-depth understanding of the concepts of drug action and the mechanisms involved.	**L1**
	MPL201T_CO4	**Discuss** the pathophysiology and pharmacotherapy of specific diseases, emphasizing the integration of theoretical and practical knowledge.	**L6**
	MPL201T_CO5	**Analyze** and comprehend the adverse effects, contraindications, and clinical uses of drugs employed in the treatment of diseases.	**L4**
MPL202T Pharmacological & Toxicological Screening Methods-II - Theory	**MPL202T_CO1**	**Explain** the various types of toxicity studies	**L2, L5**
	MPL202T_CO2	**Appreciate** the importance of ethical and regulatory requirements for toxicity studies	**L3**
	MPL202T_CO3	**Understand** reproductive toxicology studies and genotoxicity studies	**L2, L5**
	MPL202T_CO4	**Discuss** IND enabling studies and Safety pharmacology studies	**L6**
	MPL202T_CO5	**Explain** importance and applications of toxicokinetic studies	**L2, L5**
MPL203T Principles of Drug Discovery-Theory	**MPL203T_CO1**	**Describe** in detail about various stages involved in modern drug discovery process	**L2**
	MPL203T_CO2	**Explain** the role of genomics, proteomics, and bioinformatics in drug discovery	**L2, L5**
	MPL203T_CO3	**Explain** various targets for drug discovery	**L2, L5**
	MPL203T_CO4	**Explain** various lead seeking method and lead optimization	**L2, L5**
	MPL203T_CO5	**Describe** in detail about the concept of Rational Drug Design	**L2**
	MPL203T_CO6	**Explain** the concept of molecular docking and its applications	**L2, L5**
	MPL203T_CO7	**Explain** the concept of QSAR and QSAR statistical methods	**L2, L5**
	MPL203T_CO8	**Explain** Rationale of prodrug design and practical consideration of prodrug design	**L2, L5**
MPL 204T Clinical Research and Pharmacovigilance-Theory	**MPL 204T_CO1**	**Provide** students with a value addition and address current requirements in the dynamic fields of clinical research and pharmacovigilance.	**L3**
	MPL 204T_CO2	**Create** knowledge and skills to develop comprehensive plans for conceptualizing, designing, conducting, managing, and reporting on clinical trials	**L6**
	MPL 204T_CO3	**Explore** the global scenario of pharmacovigilance,	**L2, L5**

		covering various methods used to generate safety data and their applications in different regions.	
	MPL 204T_CO4	**Instruct** students in the development of drug safety data, spanning pre-clinical and clinical phases of drug development, as well as post-market surveillance practices.	**L3**
	MPL 204T_CO5	**Evaluate** the effectiveness of different methods for assessing and reporting adverse drug reactions, considering their reliability and relevance	**L5**
MPL205P Pharmacology Practical - II- Practical	**MPL205P_CO1**	**Apply** knowledge to design in-vitro experiments that incorporate different isolated tissue models	**L3**
	MPL205P_CO2	**Demonstrate** Proficiency in Applying OECD Guidelines to Conduct Acute Toxicity Studies for Safety Evaluations	**L2**
	MPL205P_CO3	**Formulate** strategies for effective monitoring and management of Adverse Drug Reactions (ADR) in cardiovascular research	**L6**
M. Pharm II (Semester-III) in Pharmacology			
MRM301T Research Methodology and Biostatistics - Theory	**MRM301T_CO1**	**Develop** the ability to apply appropriate research methods, choose a suitable research design, and establish a framework for conducting research projects.	**L3, L6**
	MRM301T_CO2	**Describe** the relevant statistical methods necessary for a specific research design and formulate appropriate research hypotheses for a research project.	**L2**
	MRM301T_CO3	**Develop** the ability to articulate and implement medical ethics, control regulations, cultural considerations, confidentiality, and conflict of interest in research studies.	**L3, L6**
	MRM301T_CO4	**Explain** CPCSEA guidelines, SOPs for laboratory animal facilities, environmental protection, and personnel training in compliance with ethical standards.	**L2, L5**
	_CO5	**Implement** basic principles of medical research while ensuring medical care in accordance with the Declaration of Helsinki.	**L3**
MPH Journal Club [Theory | Regular]	**MPH Journal Club_CO1**	**Develop** the ability to formulate research questions in an answerable form.	**L3, L6**
	MPH Journal Club_CO2	**Discuss** critical appraisal methods for evaluating the validity, significance of results, and clinical applicability of research articles.	**L6**
	MPH Journal Club_CO3	**Conduct** a systematic search in pharmaceutical bibliographic databases to identify relevant articles and compile scientific data using computer software.	**L3**

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