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

Channabasweshwar Pharmacy College (Degree) LATUR

Principal
Channabasweshwar Pharmacy
College (Degree), Latur