PHARM D Course Outcomes

PD 1101T	Course Title: Human anatomy and Physiology (PD 1101T) Year: I
CO Code No.	**Course outcome**
CO1101T.1	Explain different terminology, anatomy and physiology, and pathology of each body system and how they interrelate to maintain homeostasis.
CO1101T.2	Classify and explain different types of tissue, skeletal system and joints, Haemopoetic and lymphatic system, homeostatic mechanism and its altered physiology
CO1101T.3	Explain the anatomy and Physiology of cardio vascular, respiratory, digestive, nervous, urinary and reproductive system and its disorders
CO1101T.4	Explain the Anatomy and Physiology of endocrine system and sense organs and its disorders
CO1101T.5	Describe the Physiology of muscle contraction and its disorders, sport physiology , drugs and athletics

PD 1103T	Course Title: Medicinal Biochemistry (PD 1103T) Year: I
CO Code No.	**Course outcome**
CO1103T.1	Understand the catalytic activity of enzymes and importance of isoenzymes in diagnosis of diseases
CO1103T.2	Know the metabolic process of biomolecules in health and illness (metabolic disorders)
CO1103T.3	Understand the genetic organization of mammalian genome; protein synthesis; replication; mutation and repair mechanism
CO1103T.4	Know the biochemical principles of organ function tests of kidney, liver and endocrine gland
CO1103T.5	Analyze qualitatively and quantitatively biomolecules in the body fluids.

PD 1104T	Course Title: PHARMACEUTICAL ORGANIC CHEMISTRY (PD 1104T) Year: I
CO Code No.	**Course outcome**
CO1104T.1	Understand the structure, IUPAC naming and the basic physicochemical properties of the organic compounds
CO1104T.2	Compare the relative reactivities and stability of organic compounds towards various types of reaction mechanisms.
CO1104T.3	Identify the suitable mechanism involved in the synthesis of organic compounds containing various functional groups
CO1104T.4	Apply different named reactions for the synthesis of useful organic compounds
CO1104T.5	Analyse the medicinally useful organic compounds using quantitative methods

PD 1105T	Course Title: PHARMACEUTICAL INORGANIC CHEMISTRY (PD 1105T) Year: I
CO Code No.	**Course outcome**
CO1105T.1	To develop the ideas with the fundamental of analytical chemistry among the pupil. . It facilitate the fellow pupil to predict the sources of mistakes and errors
CO1105T.2	To construct the fundamental methodology to prepare different strength of solutions. To develop the fundamentals of volumetric analytical skills. . Familiar with different classes of inorganic pharmaceuticals and their analysis
CO1105T.3	To acquaint with the principles of limit tests and the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals
CO1105T.4	Identification of different anions, cat ions and different inorganic pharmaceuticals, medicinal and pharmaceutical importance of inorganic compounds
CO1105T.5	To introduce a variety of inorganic drug classes

PD 1109P	Course Title: Medicinal Biochemistry (PD 1109P) Year: I
CO Code No.	**Course outcome**
CO1109P.1	To identify biomolecules qualitatively in the body fluids.
CO1109P.2	To know the biochemical principles of organ function tests of kidney, liver and endocrine gland.
CO1109P.3	To understand the catalytic activity of enzymes
CO1109P.4	To prepare standard Buffer solutions
CO1109P.5	To analyze biomolecules in the body fluids quantitatively

PD 1111P	Course Title: PHARMACEUTICAL INORGANIC CHEMISTRY (PD 1111P) Year: I
CO Code No.	**Course outcome**
CO1111P.1	To perform limit tests
CO1111P.2	To identify inorganic compound and their test for identification
CO1111P.3	To explain the concept of purity and various parameter for purity
CO1111P.4	To explain the preparation methods of inorganic pharmaceuticals and their application in in pharmacy
CO1111P.5	To perform Assays of different inorganic compounds

PD 2102T	Course Title: Pharmaceutical Microbiology (PD 2102T) Year: II
CO Code No.	**Course outcome**
CO2102T.1	develop methods for qualitative and quantitative analysis of microorganisms.
CO2102T.2	apply sterilization and disinfection methods in the pharmaceutical industry.
CO2102T.3	analyze antimicrobial agents and microbial contaminants of pharmaceutical products.
CO2102T.4	categorize immunological and therapeutic products.
CO2102T.5	distinguish communicable and non-communicable diseases and use immunization principles to prevent and control the diseases.
CO2102T.6	select appropriate methods for microbiological standardization of antibiotics and vitamins.

PD 2103T	Course Title: PHARMACOGNOSY & PHYTOPHARMACEUTICALS (PD 2103T) Year: II
CO Code No.	**Course outcome**
CO2103T.1	Describe the history and scope of Pharmacognosy
CO2103T.2	Describe the Cultivation, Collection, Processing, Storage and Conservation of Medicinal Plants&morphology and microscopy of different plant parts
CO2103T.3	Discuss regarding natural pesticides and their sources; describe the various plant fibers used in surgical dressings and related products
CO2103T.4	Describe the pharmacognosy and chemistry of carbohydrates, lipids, proteins and elaborate on their sources
CO2103T.5	Discuss the various therapeutic applications of herbs, poisonous plants; describe Herb-drug interaction, Edible Vaccines and Marine Pharmacognosy
CO2103T.6	Describe different types of secondary metabolites (Alkaloids, Glycosides, Essential oils, Flavonoids, Resins and Tannins), their general properties, classification, test for identification and isolation technique

PD 2104T	Course Title: PHARMACOLOGY-I (PD 2104T) Year: II
CO Code No.	**Course outcome**
CO2104T.1	Remember fundamental concepts of pharmacology and Understand basics of pharmacokinetics and pharmacodynamics.
CO2104T.2	Recall neurohumoral transmission, neurotransmitters and peripheral nervous system.
CO2104T.3	Relate the relative pros and cons in the use of drugs for various cardiac complications.

CO2104T.4	Identify the role of autocoids and related drugs.
CO2104T.5	Analyze and summarize the drugs acting on endocrine system.
CO2104T.6	Students will be able to identify the drugs for treating various respiratory and gastrointestinal complications

PD 2106T	**Course Title: Pharmacotherapeutics I (PD 2106T)** **Year: II**
CO Code No.	**Course outcome**
CO2106T.1	Students will be able to describe the pathophysiology and management of cardio vascular diseases, respiratory diseases, endocrine diseases, ophthalmology and general prescribing guidelines.
CO2106T.2	Students will be developing Patient case-based Assessment Skills.
CO2106T.3	Students will be able to describe the quality use of medicines, issues, controversies surrounding the therapeutic agents in the treatment of diseases.
CO2106T.4	Students will have developed clinical skills in the therapeutic management based on diagnosis.
CO2106T.5	Continue to develop communication skill to interact with other health care professionals
CO2106T.6	Capable to utilize information from guidelines, literature and with the approach of all relevant evidence base, the student should be able to devise, formulate and plan medication management in a clinical situation.

PD 2109PT	**Course Title: Pharmacotherapeutics I (PD 2109P)** **Year: II**
CO Code No.	**Course outcome**
CO2109P.1	Students will be able to describe the pathophysiology and management of cardio vascular diseases, respiratory diseases, endocrine diseases, ophthalmology and general prescribing guidelines.
CO2109P.2	Students will be developing Patient case-based Assessment Skills.
CO2109P.3	Students will be able to describe the quality use of medicines, issues, controversies surrounding the therapeutic agents in the treatment of diseases.
CO2109P.4	Students will have developed clinical skills in the therapeutic management based on diagnosis.
CO2109P.5	Continue to develop communication skill to interact with other health care professionals
CO2109P.6	Capable to utilize information from guidelines, literature and with the approach of all relevant evidence base, the student should be able to devise, formulate and plan medication management in a clinical situation.

PD 3102T	Course Title: Pharmaceutical Analysis (PD 3102T) Year: III
CO Code No.	**Course outcome**
CO3102T.1	Recall the separation and identification of compounds by Chromatographic techniques.
CO3102T.2	Explain the qualitative and quantitative analysis of drugs by spectroscopic techniques.
CO3102T.3	Experiment with instrumental analysis of selected drugs as pharmacopeia.
CO3102T.4	Compare and characterize compounds by using analytical techniques
CO3102T.5	Determine concentration of ions by electrometric analysis.
CO3102T.6	Discuss the instrumentation, applications of advanced analytical techniques and to interpret spectral data.

PD 3103T	Course Title: Pharmacotherapeutics II (PD 3103T) Year: III
CO Code No.	**Course outcome**
CO3103T.1	Students will be able to describe the pathophysiology and management of infectious disease,oncology,musculoskeleton disorders,dermatological disease.
CO3103T.2	Students will be developing Patient case based Assessment Skillls.
CO3103T.3	Students will be able to describe the quality use of medicines, issues,controversies surrounding the therapeutic agents in the treatment of diseases.
CO3103T.4	Students will have developed clinical skills in the therapeutic management based on diagnosis.
CO3103T.5	Continue to develop communication skill to interact with other health care professionals
CO3103T.6	Capable to utilize information from guidelines, literature and with the approach of all relevant evidence base, the student should be able to devise, formulate and plan medication management in a clinical situation.
PD 3104T	**Course Title: Pharmaceutical Jurisprudence (PD 3104T) Year: III**
CO Code No.	**Course outcome**
CO3104T.1	To know and practice the professional Ethics and to Understand the various concepts of the pharmaceutical legislation in India
CO3104T.2	To know the various parameters in the Drug and Cosmetic Act and rules
CO3104T.3	To Know the drug policy ,DPCO, Patent and design act and to understand the labelling requirements and packaging guidelines for drugs and cosmetics
CO3104T.4	To understand the concepts of Dangerous Drugs Act, Pharmacy Act and Excise duties Act
CO3104T.5	To know the laws as prescribed by the Pharmacy Council of India from time to time including International Laws
CO3104T.6	To know and practice the professional Ethics and to Understand the various concepts of the pharmaceutical legislation in India

PD 3105T	Course Title: Medicinal Chemistry (PD 3105T) Year: III
CO Code No.	**Course outcome**
CO3105T.1	Apply the various modern concepts used in CADD, QSAR, and drug design studies (Applying)
CO3105T.2	Discuss the detailed Prodrug concept and combinatorial chemistry aspects. (Understanding)
CO3105T.3	Explain and deal with the IUPAC, MOA,Classification, adverse effects, anti-infective, cardiovascular, and other various categories of agents. (Understanding)
CO3105T.4	Distinguish various categories of agents with structures with respect to their chemical nature. (Analyzing)
CO3105T.5	Sketch the chemical synthesis and SAR of selected category classes of drugs. (Applying)
CO3105T.6	Describe various drugs belonging to the Class of steroids and steroidal hormones. (Understanding)

PD 3106T	Course Title: Pharmaceutical formulations (PD 3106T) Year: III
CO Code No.	**Course outcome**
CO3106T.1	Explain the significance of various pharmaceutical dosage forms and excipients
CO3106T.2	Understand the formulation, production and quality control testing of tablets, capsules and liquid orals
CO106T.3	Understand the formulation, production and quality control testing of sterile products and semi solid dosage forms
CO3106T.4	Describe the concepts of controlled drug delivery systems
CO3106T.5	Describe the concepts of novel drug delivery systems

PD 3109P	Course Title: Pharmacotherapeutics II (PD 3109P) Year: III
CO Code No.	**Course outcome**
CO3109P.1	Students will be able to describe the pathophysiology and management of infectious disease, oncology ,Musculo skeleton disorders ,dermatological diseases.
CO3109P.2	Students will be developing Patient case based Assessment Skills.
CO3109P.3	Students will be able to describe the quality use of medicines, issues, controversies surrounding the therapeutic agents in the treatment of diseases.
CO3109P.4	Students will have developed clinical skills in the therapeutic management based on diagnosis.
CO3109P.5	Continue to develop communication skill to interact with other health care professionals
CO33109P.6	Capable to utilize information from guidelines, literature and with the approach of all relevant evidence base, the student should be able to devise, formulate and plan medication management in a clinical situation.

PD 3110P	Course Title: Medicinal Chemistry (PD 3110P) Year: III
CO Code No.	**Course outcome**
CO3110P.1	Synthesize important medicinal compounds and intermediate compounds in the laboratory. (Applying)
CO3110P.2	Explain the principle, scheme, and mechanism involved in drug synthesis and develop practical skills. (Understanding)
CO3110P.3	Judge the label claim of selected drugs after performing the assay. (evaluating)
CO3110P.4	Select the basic requirements for the synthesis of important medicinal compounds. (Understanding)
CO3110P.5	Analyze the important group of medicinal compounds and study their pharmacopeial monographs. (Analyzing)
CO3110P.6	Determine the partition coefficients and dissociation constants of important drug substances. (Applying)

PD 4101T	Course Title: PHARMACOTHERAPEUTICS III (PD 4101T) Year: IV
CO Code No.	**Course outcome**
CO4101T.1	Students will be able to describe the pathophysiology and management of gastrointestinal disease ,hematological disease, nervous disorders, psychiatric disorders, pain management.
CO4101T.2	Students will be developing Patient case based Assessment Skills.
CO4101T.3	Students will be able to describe the quality use of medicines, issues, controversies surrounding the therapeutic agents in the treatment of diseases.
CO4101T.4	Students will have developed clinical skills in the therapeutic management based on diagnosis.
CO4101T.5	Continue to develop communication skill to interact with other health care professionals
CO4101T.6	Capable to utilize information from guidelines, literature and with the approach of all relevant evidence base, the student should be able to devise, formulate and plan medication management in a clinical situation.

PD 4102T	Course Title: Hospital pharmacy (PD 4102T) Year: IV
CO Code No.	**Course outcome**
CO4102T.1	Describe the organizational structure of hospital & hospital pharmacy
CO4102T.2	Explain different drug policies & committees in the hospital
CO4102T.3	Operate various drug distribution methods in the hospital
CO4102T.4	Describe the management of inventory control in the hospital pharmacy
CO4102T.5	Explain the continuing professional development programs in hospitals
CO4102T.6	Understand the manufacturing practices of various formulations in hospital set up

PD 4103T	Course Title: CLINICAL PHARMACY (PD 4103T) Year: IV
CO Code No.	**Course outcome**
CO4103T.1	To monitor drug therapy of patient through medication chart review and clinical review
CO4103T.2	Obtain medication history interview and counsel the patients
CO4103T.3	To Identify and resolve drug related problems; and detect, assess and monitor adverse drug reaction
CO4103T.4	Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease
CO4103T.5	Retrieve, analyses, interpret and formulate drug or medicine information

PD 4104T	Course Title: Biostatistics and research methodology (PD 4104T) Year: IV
CO Code No.	**Course outcome**
CO4104T.1	Describe the fundamentals in research methodology, clinical study designs Sample size determination and report writing
CO4104T.2	know the role of statistical software's
CO4104T.3	Apply the statistical measures, data graphics and testing of hypothesis
CO4104T.4	Illustrate the concepts of statistical methods in the field of epidemiology
CO4104T.5	Analyse the computer usage in hospital and clinical pharmacy managements as well as drug information retrieval and storage

PD 4105T	Course Title: Biopharmaceutics and Pharmacokinetics (PD 4105T) Year: IV
CO Code No.	**Course outcome**
CO4105T.1	Discuss biopharmaceutics, pharmacokinetics, and pharmacodynamics with their applications
CO4105T.2	Explain the mechanisms and factors affecting ADME processes
CO4105T.3	Discuss the significance of pharmacokinetics in the design and evaluation of dosage forms
CO4105T.4	Differentiate between bioavailability and bioequivalence along with their measurement
CO4105T.5	Identify and select the right pharmacokinetic model for drugs administered by different routes

PD 4106T	Course Title: CLINICAL TOXICOLOGY (PD 4106T) Year: IV
CO Code No.	**Course outcome**
CO4106T.1	Describe general principles involved in the management of poisoning.
CO4106T.2	Differentiate the clinical symptoms of various acute poisonings
CO4106T.3	Analyse and manage the clinical symptoms of different acute poisonings.
CO4106T.4	Distinguish the clinical symptoms of chronic poisoning by heavy metals and manage the various clinical symptoms of different chronic poisoning by heavy metals. .
CO4106T.5	Recognize the clinical symptoms and management of envenomation, food poisoning and poisoning by various plants.
CO4106T.6	Assessment and management of signs and symptoms and treatment approaches for substance abuse

PD 4107P	Course Title PHARMACOTHERAPEUTICS III (PD 4107P) Year: IV
CO Code No.	**Course outcome**
CO4107P.1	Students will be able to describe the pathophysiology and management Of gastrointestinal disease, hematological disease, nervous disorders ,psychiatric disorders, pain management.
CO4107P.2	Students will be developing Patient case based Assessment Skills.
CO4107P.3	Students will be able to describe the quality use of medicines, issues, controversies surrounding the therapeutic agents in the treatment of diseases.
CO4107P.4	Continue to develop communication skill to interact with other health care professionals
CO4107P.5	Continue to develop communication skill to interact with other health care professionals
CO4107P.6	: Capable to utilize information from guidelines, literature and with the approach of all relevant evidence base, the student should be able to devise, formulate and plan medication management in a clinical situation.

PD 4108P	Course Title: Hospital Pharmacy (PD 4108P) Year: IV
CO Code No.	**Course outcome**
CO4108P.1	Describe the organizational structure of hospital & hospital pharmacy
CO4108P.2	Explain different drug policies & committees in the hospital
CO4108P.3	Operate various drug distribution methods in the hospital
CO4108P.4	Describe the management of inventory control in the hospital pharmacy
CO4108P.5	Explain the continuing professional development programs in hospitals
CO4108P.6	Understand the manufacturing practices of various formulations in hospital set up

PD 4109P	Course Title: : Clinical Pharmacy (PD 4108P) Year: IV
CO Code No.	**Course outcome**
CO4109P.1	Students will be able to identify ADRS and resolve drug related problems
CO4109P.2	Students will be able to interpret laboratory data of specific disease states
CO4109P.3	Students will be able to analyze drug therapy
CO4109P.4	Students will be able to summarize drug and poison information and able to describe the organizational structure of drug and poison information centers
CO4109P.5	Students will be able to adapt communication skills to conduct medication history interview and patient counselling
CO4109P.6	Continue to develop communication skills to interact with other health care professionals

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PD 4110P	Course Title: **Biopharmaceutics and Pharmacokinetics (PD 4110P)** Year: IV
CO Code No.	**Course outcome**
CO4110P.1	Compare the in-vitro drug release profile of different marketed products
CO4110P.2	Perform the solubility enhancement techniques for improvement of drug release of poorly water-soluble drugs
CO4110P.3	Estimate the bioavailability (absolute and relative) and bioequivalence from the given clinical data
CO4110P.4	Calculate the drug content in a blood sample using Area Under Curve approach
CO4110P.5	Calculate and interpret various pharmacokinetic parameters from the given clinical data

PD 5101T	Course Title: Clinical Research (PD 5101T) Year: V
CO Code No.	**Course outcome**
CO5101T.1	Discuss the Pharmacological and Toxicological considerations in process of development of new drugs.
CO5101T.2	Describe the regulatory and ethical requirements
CO5101T.3	Know safety monitoring and reporting in clinical trials
CO5101T.4	Familiarize with the roles and responsibilities of the personnel involved in conduct of clinical research to ensure the quality research is undertaken
CO5101T.5	Skills to examine information, for critical analyses and carry out research, and to communicate effectively
CO5101T.6	Understand the concepts of ICH E6, ICH E3, CDSCO guidelines and Schedule Y requirements for clinical trials

PD 5102T	Course Title: PHARMACOEPIDEMIOLOGY AND PHARMACOECONOMICS (PD 5102T) Year: V
CO Code No.	**Course outcome**
CO5102T.1	To obtain awareness on various Pharmacoepidemiological methods and its applications in public health
CO5102T.2	To gain the knowledge on Measurement of risk in clinical studies
CO5102T.3	To understand various pharmacoeconomic evaluation models
CO5102T.4	To Apply the economic principles in to clinical practice
CO5102T.5	To gain the knowledge on various software's used in both pharmacoeconomic and epidemiological studies.

PD 5103T	Course Title: :Clinical Pharmacokinetics and Therapeutic Drug Monitoring (PD 5103T) Year: V
CO Code No.	**Course outcome**
CO5103T.1	Discuss the pharmacokinetic principles to individualize drug therapy in patient care situations.
CO5103T.2	Apply the principles of pharmacokinetics to analyse and predict drug interactions
CO5103T.3	Prepare protocol for TDM of drugs for selected diseases.
CO5103T.4	Ability to design a dosage regimen of a drug based on its route of administration
CO5103T.5	Interpret and correlate the plasma drug concentration with patient's therapeutic outcomes
CO5103T.6	Interpret the impact of genetic polymorphisms of individuals on pharmacokinetics and pharmacodynamics of drugs.

PD 5104T	Course Title: : Clerkship (PD 5104T) Year: V
CO Code No.	**Course outcome**
CO5104T.1	Gain knowledge regarding the collection of patient medication history, interview, provisional diagnosis critical analysis of prescriptions, assessment of drug-drug interactions, adverse drug interactions and bed side patient counselling.
CO5104T.2	Discuss the role of Pharmacist in clinical pharmacy services.
CO5104T.3	Demonstrate the skills of a clinical Pharmacist.
CO5104T.4	Discuss the available therapeutic options in the management of diseases.
CO5104T.5	Prepare a pharmaceutical care plan for a given case.
CO5104T.6	Detect ,Interpret and report medication errors and drug interactions

PD 5105T	Course Title: : Project work (PD 5105T) Year: V
CO Code No.	**Course outcome**
CO5105T.1	Address a problem related to Pharmacy practice in hospital, community service or clinical set up with a wider perspective and generality
CO5105T.2	Define the problem to be addressed and translate it into a statement of aim, objectives, scope and plan for the project
CO5105T.3	Carry out and report an information survey and take account of findings in executing project
CO5105T.4	Evaluate, select and apply relevant theories and techniques from the full range of courses studied using conceptual models and frameworks to enhance depth of understanding
CO5105T.5	Select appropriate methodology for investigative work, taking into account the pros and cons of the alternatives available and develop solution proposals based on reasoned judgement
CO5105T.6	Present a coherent, logically argued, fully referenced report and engage in a professional manner in a viva-voce discussion about the project