



SIR C.R.REDDY COLLEGE OF PHARMACEUTICAL SCIENCES

(An ISO 9001 : 2015 Certified Institution)

(Affiliated to Andhra University, Visakhapatnam; Recognized by Dept. of Technical Education, Govt. of A.P)

(Approved by AICTE & PCI, New Delhi)

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PROGRAMME: PHARM D (COURSE OUTCOMES)

Course Name: Human Anatomy and Physiology (Theory) Course code: PD 1.1 T, I/VI PHARM.D

PD 1.1 T.1	To understand basic concepts of cell and its components and functions and know more about elementary tissues, skeletal system and their disorders.
PD 1.1 T.2	To gain more knowledge on blood and its components, Lymphatic system, heart and its methods of heart rate regulation.
PD 1.1 T.3	To comprehend more on physiology of respiration, respiratory volumes and transport of respiratory gasses and get knowledge on physiology of digestion, absorption and its disorders.
PD 1.1 T.4	To interpret the functions of sympathetic & parasympathetic N.S along with physiology of Brain stem and carefully understand the physiology of urinary system, formation of urine and Renin Angiotensin system
PD 1.1 T.5	To assess the release of various endocrine hormones from glands like Pituitary gland, Adrenal gland, Thyroid and Parathyroid glands, Pancreas, gonads and improve the understanding on male and female reproductive hormones
PD 1.1 T.6	To improve the knowledge on physiology of various sensory organs, skeletal muscle and interpret the physiology of muscle and respiration during exercise.

Course Name: Human Anatomy and Physiology (Practical) Course code: PD

1.1P, I/VI PHARM.D

PD 1.1 P.1	To study the tissues of Epithelial, Muscular, Connective, Nervous tissues.
PD 1.1 P.2	To Study of appliances used in haematological experiments.
PD 1.1 P.3	To determine the W.B.C, R.B.C, differential count of blood, ESR, HB, BT & CT
PD 1.1 P.4	To determine the Blood pressure and blood group and study of various systems like Skeletal, Cardiovascular, Respiratory, Digestive, Urinary, Nervous, Special senses and Reproductive systems with the help of charts, models & specimens
PD 1.1 P.5	To Study about the pregnancy diagnosis test, different family planning appliances and appliances used in experimental physiology
PD 1.1 P.6	To record simple effect of simple muscle curve, summation curve, effect of temperature, simple fatigue curve using gastronemius sciatic nerve preparation.

Course Name: Pharmaceutics (Theory) Course code: PD 1.2T, I/VI

Pharm D

PD 1.2 T.1	To define the profession of pharmacy and pharmacopoeias.
PD 1.2 T.2	To outline the classification of dosage forms, summarize importance of prescription and posology.
PD 1.2 T.3	To develop monophasic and biphasic liquid dosage forms.
PD 1.2 T.4	To simplify the preparation of suppositories and powders.
PD 1.2 T.5	To explain the concepts of surgical aids and galenicals.
PD 1.2 T.6	To elaborate the importance of pharmaceutical incompatibilities and solve calculations.

Course Name: Pharmaceutics (Practical) Course code: PD 1.2P, I/VI Pharm D

PD 1.2 P.1	To remember the principles used in the preparation of liquid, semisolid and solid dosage forms.
PD 1.2 P.2	To illustrate monophasic internal and external liquid dosage forms.
PD 1.2 P.3	To experiment with biphasic liquid dosage forms.
PD 1.2 P.4	To take part in formulation of powder dosage forms.
PD 1.2 P.5	To appraise the formulation of suppositories.
PD 1.2 P.6	To solve the prescriptions having the incompatibility problems.

Course Name: Medicinal Biochemistry (Theory) Course Code: PD 1.3, I

Pharm D

PD 1.3.T.1	To attain the knowledge of the biomolecules and their mechanism of action in the living system.
PD 1.3.T.2	To understand the catalytic activity of the enzymes in biochemical pathways
PD 1.3.T.3	To correlate the biochemical reactions , their pathways and several metabolic
PD 1.3.T.4	To gain knowledge at the molecular and genomic level.
PD 1.3.T.5	To attain the knowledge of the various functional tests of the organs (Organ
PD 1.3.T.6	Gather the knowledge in the common clinical biochemistry laboratory and to know to utilize the laboratory equipment and to analysis the data of the

Course Name: Medicinal Biochemistry (Practical) Course Code: PD 1.3, I

PharmD

PD 1.3P.1	To identify the qualitative analysis of normal, abnormal constituents of a urine sample.
PD 1.3P.2	To quantitatively estimate the sugar, chloride, creatinine, and calcium in urine sample.
PD 1.3P.3	Estimation of serum cholesterol, blood creatinine, and blood glucose.
PD 1.3P.4	Estimate SGOP, SGPT, urea, proteins, and bilirubin.
PD 1.3P.5	Enzymatic determination of glucose and enzymatic hydrolysis of glycogen.
PD 1.3P.6	To analyze Lipid profile tests and to determine sodium, potassium, and calcium in serum.

Course Name: Pharmaceutical Organic Chemistry (Theory) Course Code: PD 1.4,

I Pharm. D

PD 1.4 T.1	To understand the structural properties, nomenclature, and isomerism of Organic compounds.
PD 1.4 T.2	To learn various reactions involving free radicals or electrophiles or nucleophiles
PD 1.4 T.3	To obtain information on substitution or elimination or addition reactions and their stabilities.
PD 1.4 T.4	To understand various named reactions with mechanisms
PD 1.4 T.5	To understand the oxidation-reduction reactions.
PD 1.4 T.6	To be able to write the preparation method, test for purity, the principle involved in the assay, and medicinal uses of organic compounds.

Course Name: Pharmaceutical Organic Chemistry (Practical) Course Code: PD

1.4, I Pharm.D

PD 1.4 P.1	To synthesize the specific organic compounds
PD 1.4 P.2	To calculate the percentage yield of synthesized organic compounds
PD 1.4 P.3	To identify unknown organic compounds using systematic qualitative analysis
PD 1.4 P.4	To get knowledge on stereo models of organic structures

Course Name: 1.5 Pharmaceutical Inorganic Chemistry (Theory) Course Code: 1.5,

Pharm D, First year.

PD 1.5 T.1	To gain knowledge on fundamentals of Analytical chemistry.
PD 1.5 T.2	To study the inorganic pharmaceuticals regarding their monographs
PD 1.5 T.3	To get knowledge on analysis of various pharmaceuticals
PD 1.5 T.4	To understand the principles and procedures of analysis of drugs.
PD 1.5 T.5	To learn about inorganic pharmaceuticals and their applications
PD 1.5 T.6	To appreciate the importance of inorganic pharmaceuticals in preventing and curing the disease.

Course Name: 1.5 Pharmaceutical Inorganic Chemistry (Practical) Course Code: 1.5,

Pharm D, First year.

PD 1.5 P.1	To perform the limit test for a given sample.
PD 1.5 P.2	To determine the test for purity for the given sample.
PD 1.5 P.3	To Estimate the mixtures in the given sample.
PD 1.5 P.4	To carry out the identification tests with the given sample.
PD 1.5 P.5	To prepare and submit given inorganic pharmaceuticals.

Course Name: Remedial biology (THEORY) Course Code: PD 1.6 I/VI

PharmD

PD 1.6 T.1	To understand Plant cell, tissues and inclusions
PD1.6 T.2	To study about plant kingdom classification and morphology of plant parts and its modifications.
PD 1.6 T.3	Understand the basic components of anatomy and physiology of plant, Taxonomy of plant families.
PD 1.6 T.4	To study about fungi, yeast, penicillin and bacteria
PD 1.6 T.5	To study about animal cell and its tissues
PD 1.6 T.6	To gain knowledge frog, pisces, reptiles, aves, mammals and poisonous animals.

Course Name: Remedial biology (PRACTICAL) Course Code: PD 1.6 I/VI

PharmD

PD 1.6 P.1	To gain knowledge on plant cell, cell wall constituents and cell inclusions
PD 1.6 P.2	To study plant parts like stem, root etc. with their modifications
PD 1.6 P.3	To gain knowledge on preparation of permanent slides
PD 1.6 P.4	To understand the procedures involved in transverse sections of crude drugs
PD 1.6 P.5	To identify plant parts, animals and detailed study of frog systems

Course Name: REMEDIAL MATHEMATICS (THEORY)

Course Code: PD 106T, I/VI Pharm D

PD 1.6T.1	To Know Trigonometry, Analytical geometry, Trigonometry , Matrices, Determinant, integration, Differential equation, Laplace transform and their applications
PD 1.6T.2	To Solve the problems of different types by applying theory.
PD 1.6T.3	To Appreciate the important applications of mathematics in pharmacy
PD 1.6T.4	Communicate mathematical knowledge and understanding to help in the field of Clinical Pharmacy
PD 1.6T.5	To solve and convert elementary functions using Laplace transform

Course Name: PATHOPHYSIOLOGY (THEORY)

Course Code: PD 2.1T, II/VI Pharm D

PD 2.1T.1	Students should be able to describe the etiology and pathogenesis of the selected disease states.
PD 2.1T.2	Students should be able to name the signs and symptoms of the diseases.
PD 2.1T.3	Students should be able to explain the concept of cell injury, inflammation, immunity and cancers.
PD 2.1T.4	Students should be able to explain the concept of biological effects of radiation, environmental and nutritional diseases.

Course Name: Pharmaceutical Microbiology (Theory) Course code: PD 2.2T,

II/VI Pharm D

2.2 T.1	Evolution of microbial world and its relationship with among them. Study of different types of microbes
2.2 T.2	Understanding requirements of microbial world. Methods of identification, counting of bacteria
2.2 T.3	Controlling microbes in pharmaceutical formulations. Understanding Disinfectants and its evaluation
2.2 T.4	Role immunity in disease development. Methods of diagnosis of various diseases
2.2 T.5	Estimation of chemicals by using microbes. Study of infectious diseases

Course Name: Pharmaceutical Microbiology (Practical) Course code: PD 2.2 P,

II/VI Pharm D

2.2 P.1	Determine and report the Sterilization of glassware, preparation and sterilization of media, Sub culturing of bacteria and fungus. Nutrient stabs and slants preparations
2.2 P.2	Determine the methods of Simple, Grams staining and acid fast staining.
2.2 P.3	Isolate pure culture of micro-organisms by multiple streak plate technique.
2.2 P.4	Determine the Microbiological assay of antibiotics by cup plate method, Motility determination by Hanging drop method.
2.2 P.5	Understand enumeration of micro-organisms (Total and Viable) & Determination of minimum inhibitory concentration.

Course Name: PHARMACOGNOSY & PHYTOPHARMACEUTICALS (THEORY)

Course Code: PD 2.3 T, II/VI Pharm D

PD 2.3T.1	To obtain knowledge about the introduction, history of pharmacognosy and classification of drugs
PD 2.3T.2	To know the cultivation, collection, storage and method of cultivation for crude drugs.
PD 2.3T.3	To understand the cell wall constituents, present during microscopical study of various crude drugs.
PD 2.3T.4	Students gain knowledge on usage of natural pesticides and detail information on various carbohydrates related products and drugs
PD 2.3T.5	To understand the concepts of sources, method extraction and method analysis of lipids with detailed study of oils.
PD 2.3T.6	To gain knowledge on adulteration of drugs, various plant fibers used in surgical dressings and brief information on proteins.

**Course Name: PHARMACOGNOSY & PHYTOPHARMACEUTICALS
(PRACTICAL)**

Course Code: PD 2.3 P, II/VI Pharm D

PD 2.3 P.1	To gain knowledge on plant cell, cell wall constituents and cell inclusions
PD 2.3 P.2	To identify crude drugs based on macro, powder and microscopical characters
PD 2.3 P.3	Students will gain knowledge on principles and procedures involved in determination of analytical constants
PD 2.3 P.4	To identify the crude drugs by chemical test
PD 2.3 P.5	To identify the lipid containing drugs by chemical test

Course Name: PHARMACOLOGY – I (Theory) Course code: PD 2.4 T, II/VI

PHARM.D

PD 2.4 T.1	To understand basics of pharmacology and more on pharmacodynamics and pharmacokinetics toxicity studies.
PD 2.4 T.2	To gain more knowledge on drugs acting on ANS, Cardiovascular disorders, Mydriactics, miotics, myasthenia gravis and Parkinsonism.
PD 2.4 T.3	To improve the comprehension on local general anaesthetic agents and drugs acting on psychological disorders and cognition enhancement.
PD 2.4 T.4	To carefully understand the physiology of respiration and drugs targeting respiratory disorders like asthma and COPD
PD 2.4 T.5	To assess the release of Thyroid, pancreas, sexual hormones and drugs targeting on their disorders.
PD 2.4 T.6	To gain more understanding on kinetics and dynamics of autacoids and their antagonists.

Course Name: COMMUNITY PHARMACY (THEORY)

Course Code: PD 2.5T, II/VI Pharm D

PD 2.5T.1	Students should know about various pharmaceutical care services.
PD 2.5T.2	Students should know about the business and professional practice management skills in community pharmacies.
PD 2.5T.3	Students should able to do patient counseling & provide health screening services to public in community pharmacy.
PD 2.5T.4	Students should able to respond to minor ailments and provide appropriate medication.

PD 2.5T.5

Students should clearly learn about the concept of rational drug therapy.

Course Name: PHARMACOTHERAPEUTICS-I (THEORY)

Course Code: PD 2.6T, II/VI Pharm D

PD 2.6T.1	Students should understand the etiopathogenesis of selected disease states.
PD 2.6T.2	Students should know about the various methods involved in the diagnosis of selected disease states.
PD 2.6T.3	Students should be able to interpret and analyse the selected laboratory results of specific disease states.
PD 2.6T.4	Students should be able to describe the therapeutic approach to manage the selected diseases.
PD 2.6T.5	Students should be able to discuss the rationale for drug therapy.
PD 2.6T.6	Students should be able to understand the individualized therapeutic plans based on diagnosis.

Course Name: PHARMACOTHERAPEUTICS-I (PRACTICAL)

Course Code: PD 2.6 P, II/VI Pharm D

PD 2.6P.1	Student should be able to describe the pathophysiology and management of cardiovascular, respiratory and endocrine diseases.
PD 2.6P.2	Student should be able to develop the patient case-based assessment skills.
PD 2.6P.3	Student should be able to describe the quality use of medicines issues surrounding the therapeutic agents in the treatment of diseases.
PD 2.6P.4	Student should be able to develop clinical skills in the therapeutic management of disease conditions.
PD 2.6P.5	Student should be able to develop communication skills.
PD 2.6P.6	Student should be able to provide patient-centered care to diverse patients using the evidence-based medicine.

Course Name: PHARMACOLOGY – II (Theory) Course code: PD 3.1 T,

III/VI PHARM .D

PD 3.1 T.1	To gain more understanding on drugs targeting on coagulation, thrombolysis and improve knowledge on haemopoietics, plasma expanders.
PD 3.1 T.2	To interpret the physiology of renal system and give elaborate explanation on drugs which causes diuresis and anti-diuresis.
PD 3.1 T.3	To comprehend the importance of different types of antibiotics, know more about chemotherapy for cancer, fungal, viral, bacterial and protozoal infections
PD 3.1 T.4	To elaborate the role of immune system in organ transplantation and antibody production in human body.
PD 3.1 T.5	To improve updated knowledge on different types of animal toxicity studies.
PD 3.1 T.6	To review knowledge on basic structure of cell and its components, functions, stressing on points related to gene expression, protein synthesis, DNA technology and gene therapy.

Course Name: PHARMACOLOGY – II (Practical) Course code: PD 3.1 P,

III/VI PHARM .D

PD 3.1 P.1	To Study the laboratory animals and their handling, physiological salt solutions, laboratory appliances and anaesthetics used in experimental pharmacology
PD 3.1 P.2	To record the dose response curve of Ach, bioassay of Ach using isolated ileum muscle preparation by interpolation and three point method.
PD 3.1 P.3	To record the dose response curve of Histamine, study the agonistic and antagonistic effects of drugs using isolated guinea-pig ileum preparation
PD 3.1 P.4	To carry out bioassay of Histamine using isolated guinea-pig ileum preparation by interpolation and three point method.
PD 3.1 P.5	To Study the routes of administration of drugs in animals (Rats, Mice, Rabbits).
PD 3.1 P.6	To study theory principal involved in Analgesic, Anti-inflammatory, Anticonvulsant, Antidepressant, Locomotor and Cardiotonic activities

Course Name: Pharmaceutical Analysis (Theory) Course Code: PD 3.2T, III

Pharm.D

PD 3.2 T.1	To understand the importance of Quality in Pharmaceuticals.
PD 3.2 T.2	The students will gain appropriate knowledge about appropriate analytical skills required for the analysis of API and formulations.
PD 3.2 T.3	To understand the basic knowledge on assay of single and multiple component pharmaceuticals by using various analytical techniques.
PD 3.2 T.4	The students are explored on good practices such as GLP and ICH Guidelines.
PD 3.2 T.5	To know the importance of documentation and validation in the quality enhancement.
PD 3.2 T.6	Have understood ISO management systems and statistical tools for quality improvement.

Course Name: Pharmaceutical Analysis (Practical) Course Code: PD 3.2P, III

Pharm.D

PD 3.2 P.1	To perform quantitative estimation of pharmaceutical substances in API and finished dosage forms by UV-Visible spectrophotometer.
PD 3.2 P.2	To perform calibration for the UV Visible spectrophotometer, Analytical balance and pH meter.
PD 3.2 P.3	To perform qualitative estimation of amino acids by different paper chromatographic techniques.
PD 3.2 P.4	To possess basic idea on development of method by using UV-Visible spectroscopy and HPLC.
PD 3.2 P.5	To develop various methodologies for assay of drugs and pharmaceuticals with the skills and knowledge gained
PD 3.2 P.6	To understand and gain knowledge on trouble shooting in adopting various methodologies using instrumental techniques

Course Name: PHARMACOTHERAPEUTICS-II (THEORY)

Course Code: PD 3.3T, III/VI Pharm.D

PD 3.3T.1	Students should able to describe the pathophysiology and management of infectious, rheumatological, dermatological and oncological diseases.
PD 3.3T.2	Students should develop the patient case-based assessment skills.
PD 3.3T.3	Students should able to describe the quality use of medicine issues surrounding the therapeutic agents in the treatment of diseases.
PD 3.3T.4	Students should develop clinical skills in the therapeutic management of these conditions.

Course Name: PHARMACOTHERAPEUTICS-II (PRACTICAL)

Course Code: PD 3.3P, III/VI Pharm. D

PD 3.3P.1	Student should able to write the SOAP notes for the given case.
PD 3.3P.2	Student should able to perform treatment chart review to ensure the appropriateness of medication use.
PD 3.3P.3	Applying the pharmacotherapeutic treatment guideline and its related knowledge to evaluate the health outcomes of treatment plan and services.
PD 3.3P.4	Critically evaluating and identifying the drug related problems, adverse drug reactions and making appropriate therapeutic interventions.
PD 3.3P.5	Providing systematic patient education to the patient/caregivers on drug, disease and lifestyle related information.

Course Name: PHARMACEUTICAL JURISPRUDENCE (Theory) Course Code: PD

3.4T, III/VI PHARM. D

PD 3.4T.1	They attain knowledge on pharmaceutical legislations and pharmaceutical ethics
PD 3.4T.2	They understand the concepts of drugs and cosmetics act including pharmacy act.
PD 3.4T.3	They obtain the knowledge on various parameters of medicinal and toilet preparations and narcotic drugs and psychotropic substances act.
PD 3.4T.4	They came to know the salient features of drugs and magic remedies act including essential commodities act
PD 3.4T.5	They understand the concepts of drug price control order and prevention of cruelty to animals act
PD 3.4T.6	They obtain the knowledge on patents and design act with brief aspects of utilization about prescription and non-prescription products

Course Name: Medicinal Chemistry (Theory) Course Code: PD 3.5, III/VI

Pharm.D

PD 3.5 T.1	To understand the modern concept of rational drug design
PD 3.5 T.2	To learn about combinatorial chemistry, computer-aided drug design
PD 3.5 T.3	To learn classifications, mechanisms, and uses of anti-infectives, antimalarials and antibiotics
PD 3.5 T.4	To get knowledge on anti-neoplastic agents, cardiovascular drugs hypoglycemic agents and their drug profile
PD 3.5 T.5	To obtain information on Diuretics and agents acting as diagnosing agents.
PD 3.5 T.6	To know about the structural activity relationship of drugs along with their biological activity changes

Course Name: Medicinal Chemistry (Practical) Course Code: PD 3.5, III/VI

Pharm.D

PD 3.5 P.1	To assay the important drugs and also to calculate their percentage purity
PD 3.5 P.2	To prepare medicinally important compounds and calculating their percentage yield
PD 3.5 P.3	To analyze monographs for important drugs
PD 3.5 P.4	To determine the physical constants of compounds using QSAR analysis

Course Name: Pharmaceutical Formulations (Theory) Course code: PD 3.6T,

III/VI Pharm D

PD 3.6 T.1	To recall the basic concepts of pharmaceutical dosage forms.
PD 3.6 T.2	To explain formulation, coating and evaluation of tablets.
PD 3.6 T.3	To develop and examine capsule dosage forms.
PD 3.6 T.4	To simplify the formulation, evaluation and stability considerations of liquid orals. The preparation and quality control of parenteral preparations.
PD 3.6 T.5	To appraise parenteral, ophthalmic, semisolids products and packaging material.
PD 3.6 T.6	To design various sustained and controlled drug delivery systems.

Course Name: Pharmaceutical Formulations (Practical) Course code: PD 3.6P,

III/VI Pharm D

PD 3.6 P.1	To recall the preparation and evaluation of compressed tablets.
PD 3.6 P.2	To illustrate the basic requirements for formulation and evaluation of capsules.
PD 3.6 P.3	To develop parenteral formulations.
PD 3.6 P.4	To take part in formulation of liquid orals.
PD 3.6 P.5	To justify the use of excipients and formulate of semisolid dosage forms.
PD 3.6 P.6	To develop various cosmetic preparations.

Course Name: PHARMACOTHERAPEUTICS-III (THEORY)

Course Code: PD 4.1T, IV/VI Pharm D

PD 4.1T.1	Student should able to describe the pathophysiology of selected disease states and explain the rationale for drug therapy.
PD 4.1T.2	Able to summarize the therapeutic approach in the management of various diseases.
PD 4.1T.3	To identify the importance of preparation of individualized therapeutic plans based on diagnosis.
PD 4.1T.4	To identify the patient-specific parameters relevant in initiating drug therapy and monitoring various parameters (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).

Course Name: PHARMACOTHERAPEUTICS-III (PRACTICAL)

Course Code: PD 4.1P, IV/VI Pharm D

PD 4.1P.1	Student should able to write the SOAP note for the given case.
PD 4.1P.2	Student should able to perform treatment chart review to ensure the appropriateness of medication use.
PD 4.1P.3	Applying the pharmacotherapeutic treatment guideline and its related knowledge to evaluate the health outcomes of treatment plan and services.
PD 4.1P.4	Critically evaluating and identifying the drug related problems, adverse drug reactions and making appropriate therapeutic interventions.
PD 4.1P.5	Providing systematic patient education to the patient/caregivers on drug, disease and lifestyle related information.

Course Name: HOSPITAL PHARMACY (THEORY)

Course Code: PD 4.2T, IV/VI Pharm D

PD 4.2T.1	Students should know about various drug distribution methods.
PD 4.2T.2	Students should know the professional practice management skills in hospital pharmacies.
PD 4.2T.3	Students should able to provide unbiased drug information to the doctors.
PD 4.2T.4	Students should know the manufacturing practices of various formulations in hospital set up.
PD 4.2T.5	Students should know the practice based research methods.
PD 4.2T.6	Students should know the concept of the store management and inventory control.

Course Name: HOSPITAL PHARMACY (PRACTICAL)

Course Code: PD 4.2P, IV/VI Pharm D

PD 4.2P.1	Students should able to assess the drug interactions in the given prescriptions.
PD 4.2P.2	Students should able to manufacture the parenteral formulations and powders.
PD 4.2P.3	Students should able to answer the drug information queries.
PD 4.2P.4	Students should understand the concept of Inventory control.

Course Name: CLINICAL PHARMACY (THEORY)

Course Code: PD 4.3T, IV/VI Pharm D

PD 4.3T.1	Students should able to perform the daily activities of a clinical pharmacist and should monitor the drug therapy of patient through medication chart review & clinical review.
PD 4.3T.2	Students should obtain medication history interview and can do the patient counseling by implementing various patient counseling techniques.
PD 4.3T.3	Students should identify and resolve drug related problems along with the management.
PD 4.3T.4	Students should able to detect, assess and monitor the adverse drug reactions.
PD 4.3T.5	Students should able to interpret the laboratory results of specific disease states.
PD 4.3T.6	Students should able to retrieve, analyze, interpret and formulate drug or medicine information.

Course Name: CLINICAL PHARMACY (PRACTICAL)

Course Code: PD 4.3P, IV/VI Pharm D

PD 4.3P.1	Students should able to answer the drug information questions.
PD 4.3P.2	Students should able to perform the patient medication counseling.
PD 4.3P.3	Students should able to interpret the case studies related to laboratory investigations.
PD 4.3P.4	Students should able to perform the patient medication history interview.

Course Name: Biopharmaceutics and pharmacokinetics (Theory) Course code: PD

4.5T, IV/VI Pharm D

PD 4.5 T.1	Understand the concept of ADME of drug in human body. Ability to calculate the various pharmacokinetic parameters by using various mathematical models and compartment models and describe the different pharmacokinetic models
PD 4.5 T.2	To apply the pharmacokinetic models for determination of various pharmacokinetic parameters by one compartment open model (IV Bolus and IV Infusion).
PD 4.5 T.3	To apply the pharmacokinetic models for determination of various pharmacokinetic parameters by multi compartment open model (IV Bolus and IV Infusion)
PD 4.5 T.4	Design and evaluate dosage regimens of the drugs using pharmacokinetic and biopharmaceutical factors
PD 4.5 T.5	To analyze the pharmacokinetic parameters of drugs that follows linear and nonlinear pharmacokinetics
PD 4.5 T.6	Apply the various regulations related to developing BA-BE study protocol for the new drug molecule and understanding about the concepts of in-vitro-in-vivo correlations.

Course Name: Biopharmaceutics and pharmacokinetics (Practical) Course code: PD 4.5T,

IV/VI Pharm D

PD 4.5 P.1	Understand the concept dissolution studies of two different marketed products of same drug and
PD 4.5 P.2	Understand the concept of protein drug binding studies
PD 4.5 P.3	Understand the concept of elimination Half-life for different drugs by using urinary elimination data and blood level data
PD 4.5 P.4	Ability to calculate the various pharmacokinetic parameters like K_a , K_e , Half-life, C_{max} , AUC, AUMC, MRT etc. from blood profile data..
PD 4.5 P.5	Apply the various regulations related to developing Bioequivalence studies on the different drugs on animals and human volunteers and understand the concept of bioavailability from urinary excretion data for two drugs.
PD 4.5 P.6	Understand the concept of In vitro absorption studies.

Course Name: CLINICAL TOXICOLOGY (Theory) Course code: PD 4.6 T,

IV/VI PHARM.D

PD 4.6 T.1	To understand basic concepts of Airway breathing circulation during management of poisoning, know on poison and its antidotes and the importance of basic supportive care in different types of poisonings.
PD 4.6 T.2	To comprehend processes and techniques involved in Gut decontamination and various dialysis and know more on ADME of different poisoning substances.
PD 4.6 T.3	To perceive the information on symptoms, management, diagnosis of paracetamol, opioids, barbiturates NSAIDS, radiation and metal poisonings
PD 4.6 T.4	To carefully understand the different kinds of snake bites and Plants poisoning and their respective complications and strategies involved in management.
PD 4.6 T.5	To gain updated knowledge on precautions to avoid food poisoning and basic treatment in different food poisonings.
PD 4.6 T.6	To elaborate the understanding on substance abuse and dependence of CNS stimulants, Opioids, CNS depressants, Hallucinogens, LSD, Cannabis and Tobacco.

Course Name: PHARMACOTHERAPEUTICS-I&II (THEORY)

Course Code: PD 4.7T, IV/VI Pharm D

PD 4.7 T.1	Student should able to describe the pathophysiology of selected disease states and explain the rationale for drug therapy.
PD 4.7 T.2	Able to summarize the therapeutic approach in the management of various diseases.
PD 4.7 T.3	To identify the importance of preparation of individualized therapeutic plans based on diagnosis.
PD 4.7 T.4	To identify the patient-specific parameters relevant in initiating drug therapy and monitoring various parameters (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).

Course Name: PHARMACOTHERAPEUTICS-I&II (PRACTICAL)

Course Code: PD 4.7P, IV/VI Pharm D

PD 4.7P.1	Student should able to write the SOAP notes for the given case.
PD 4.7P.2	Student should able to perform treatment chart review to ensure the appropriateness of medication errors.
PD 4.7P.3	Applying the pharmacotherapeutic treatment guidelines and its related knowledge to evaluate the health outcomes of treatment plan and services.
PD 4.7P.4	Critically evaluating and identifying the drug related problems, adverse drug reactions and making appropriate therapeutic interventions.
PD 4.7P.5	Providing systematic patient education to the patient/caregivers on drug, disease and lifestyle related information.

Course Name: CLINICAL RESEARCH (THEORY)

Course Code: PD 5.1T, V/VI Pharm D

PD 5.1 T.1	Students should know about the new drug development process.
PD 5.1 T.2	Students should understand the regulatory and ethical requirements.
PD 5.1 T.3	Students should understand the role and responsibilities of clinical trial personnel as per ICH-GCP.
PD 5.1 T.4	Students should able to design the clinical study documents.
PD 5.1 T.5	Students should know the concept of safety monitoring and reporting in clinical trials.

Course Name: PHARMACOEPIDEMIOLOGY & PHARMACOECONOMICS(THEORY)

Course Code: PD 5.2T, V/VI Pharm D

PD 5.2 T.1	Students should identify the applications of pharmacoepidemiology and pharmacoeconomics in clinical settings.
PD 5.2 T.2	Students should able to discuss the various pharmacoepidemiological outcome measures.
PD 5.2 T.3	Students should able to describe the concept of risk in pharmacoepidemiology and different methods of measuring risk.
PD 5.2 T.4	Students should able to explain the sources of data for pharmacoepidemiological studies.
PD 5.2 T.5	Students should understand the current pharmacoeconomic evaluation methods.
PD 5.2T.6	Students should able to use the softwares in pharmacoepidemiology and pharmacoeconomics analysis.

**Course Name: CLINICAL PHARMACOKINETICS &
PHARMACOTHERAPEUTIC DRUG MONITORING (THEORY)**

Course Code: PD 5.3T, V/VI Pharm D

PD 5.3 T.1	Ability to apply the concepts of pharmacokinetics to individualize the drug dosage regimen in clinical settings.
PD 5.3 T.2	Ability to design dosage regimen of a drug based on its route of administration.
PD 5.3 T.3	Ability to design and implement pharmacokinetic services such as intravenous to oral conversion of dosage regimens and therapeutic drug monitoring services.
PD 5.3 T.4	Broader understanding about the significance of altered pharmacokinetics, pharmacogenetics and pharmacogenomics.
PD 5.3 T.5	Ability to adjust the dosage regimen for patients with renal/hepatic impairments.
PD 5.3 T.6	Ability to assess the drug interaction issues in the clinical settings.