SIR C.R.REDDY COLLEGE OF PHARMACEUTICAL SCIENCES
(An ISO 9001 : 2015 Certified Instituiton)
(Affiliated to Andhra University, Visakhapatnam; Recognized by Dept.of Technical Education, Govt.of A.P)
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PROGRAMME: B.PHARMACY (COURSE OUTCOMES)

Course Name- Human Anatomy and Physiology-I (Theory)Course code: BP 101 T, I B Pharmacy, First Semester.

BP 101 T.1	To Understand the basic terminology, cell signaling pathways and types oftissues
BP 101 T.2	To gain Knowledge on structure & classifications of skeletal system, jointsand neuromuscular functions
BP 101 T.3	To interpret the types & functions of Blood and blood cells withmechanism of blood circulation & lymphatic circulation
BP 101 T.4	To describe the Peripheral nervous system and its functions and to knowabout the structure and functions of Organs of special senses.
BP 101 T.5	To improve knowledge on Cardiovascular organs, functions with special emphasis on circulatory mechanism, conducting systems and diseases ofcardio vascular system

Course Name: Pharmaceutical Analysis-I (Theory) Course code: BP102T, I B. Pharmacy, First Semester.

BP102T.1	To define and differentiate terminologies in pharmaceutical analysis &understand the importance of Good laboratory Practices (GLP),
BP102T.2	To classify different types of analytical techniques, errors and limit tests.
BP102T.3	To apply various theoretical concepts and principles involved in gasanalysis, moisture and alcohol content.

BP102T.4	To examine the importance of computation of analytical results, stoichiometric analytical problems and pH of buffers.
BP102T.5	To estimate various pharmaceutical compounds using acid -base, complexometric, non-aqueous, gravimetric techniques, redox, precipitation and diazotization titrations.

Course Name: Pharmaceutics (Theory) Course Code: BP 103 T, I B Pharmacy,

First Semester.

BP 103T.1	To know the historical background and profession of pharmacy andbasics of pharmaceutical dosage forms.
BP 103T.2	To understand the importance of prescription and posology.
BP 103T.3	To solve pharmaceutical calculations and understand the formulation of powders and liquid dosage forms.
BP 103T.4	To develop monophasic and biphasic liquid dosage forms.
BP 103T.5	To explain the concepts of suppositories and pharmaceutical incompatibilities.
BP 103T.6	To formulate and evaluate semi solid dosage forms.

Course Name: Pharmaceutical Inorganic Chemistry (Theory)Course Code: BP

104T, I B Pharmacy, First Semester.

BP 104T.1	To understand sources of impurities and methods to determine impurities.
BP 104T.2	To understand buffers, their stability, calculations, and methods of isotonicity.
BP 104T.3	To know the medicinal and pharmaceutical importance of Inorganic chemistry
BP 104T.4	To gain knowledge in inorganic pharmaceuticals and their applications

BP 104T.5	To know about radioactivity and its isotopes applications and storage conditions

Course Name: Remedial biology (Theory)

Course Code: BP 106 RBT, I B Pharmacy, First Semester.

BP 106 RBT.1	To understand living world and kingdoms of classification& Morphology of different parts of flowering plants
BP 106 RBT.2	To gain knowledge on human circulatory system, digestive system & respiratory system
BP 106 RBT.3	To understand basics of human excretory system, neural control, glands and hormones and human reproductive system.
BP 106 RBT.4	To gain knowledge on plants and mineral nutrition and photosynthesis
BP 106 RBT.5	To understand about plant cell, tissues, plant respiration and Phases of plant growth and development.

Course Name: Remedial Mathematics (Theory) Course Code: BP 106RMT, I B

Pharmacy, First Semester.

BP 106 RMT.1	To Know the concepts of mathematics and their application in pharmacy.
BP 106 RMT.2	To correlate the mathematical tools in wide professional views and solve problems of matrices.
BP 106 RMT.3	To apply both conventional and creative techniques to solve problems of calculus.
BP 106 RMT.4	To Know the Analytical geometry different types of problems byapplying mathematics.

BP 106 RMT.5	To Know the Differential equation, Laplace transform to solving Pharmacokinetic equations and their applications

Course Name- Human Anatomy and Physiology-I (Practical)Course code: BP 107-P, I. B.Pharm, First Semester.

BP 107 P.1	To understand the usage of compound microscope.
BP 107 P.2	To classify various tissues based on their characteristics by observing them under microscope.
BP 107 P.3	To Identify different types of bones in human skeletal system
BP 107 P.4	To estimate the physiological conditions of human body by recording heart rate, pulse rate, blood pressure, bleeding and clotting time.
BP 107 P.5	To determine the RBC and WBC in human blood.
BP 107 P.6	To estimate the DLC and ESR of human blood sample.

Course Name : Pharmaceutical Analysis–I(Practical);Course code: BP108P, I B Pharmacy, First Semester.

BP108P.1	To choose appropriate primary and secondary standardsin standardization and calibration methods.
BP108P.2	To determine the different limit tests and titrations.
BP108P.3	To experiment with acid-base, redox, complexometric and limit tests.
BP108P.4	To establish the importance of significant figures and computation of analytical data.
BP108P.5	To explain about GLP and estimate active pharmaceutical ingredient in pharmaceutical dosage forms.

Course Name: Pharmaceutics (Practical) Course Code: BP 109 P, II B

Pharmacy, First Semester.

BP 109P.1	To recall the principles used in the preparation of solid, liquid and semi solid dosage forms.
BP 109P.2	To experiment with monophasic liquid dosage forms for internal and external administration.
BP 109P.3	To prepare biphasic liquid dosage forms
BP 109P.4	To design powders and granules.
BP 109P.5	To develop semi solid dosage forms.
BP 109P.6	To formulate suppositories.

Course Name Pharmaceutical Inorganic chemistry (Practical)Course Code: BP

110P, I B Pharmacy, First Semester

BP 110P.1	To perform the limit test for a given sample.
BP110P.2	To carry out the identification tests with the given sample.
BP110P.3	To determine swelling power in bentonite.
BP110P.4	To analyze the acid neutralization capacity of aluminum hydroxide gel.
BP110P.5	To Perform a test for purity of potassium iodide by examining the presence of iodates in the sample
BP110P.6	To prepare and submit the given inorganic pharmaceuticals.

Course Name: Remedial biology (Practical)

Course Code: BP 112 RBP, I B Pharmacy, First Semester.

BP 112 RBP.1	To gain Knowledge on Microscope and its types, section cutting andpreparation of permanent slide.
BP 112 RBP.2	To understand the parts and structure of the cell and its inclusions
BP 112 RBP.3	Microscopic study of tissues& different parts of the plant along with their modifications.
BP 112 RBP.4	Detailed study of frog using computer models
BP 112 RBP.5	To gain knowledge on bones and to understand principle and procedures involved in determination of blood groups, blood pressure and tidal volume.

Course Name- Human Anatomy and Physiology-II (Theory)Course code: BP 201

T, I. B. Pharmacy, Second Semester.

BP 201 T.1	To explain the Classification, types, functions of nerves, action potential, nerve impulses, reflex action.
BP 201 T.2	To describe various functions of digestive organs and its diseases, treatments
BP 201 T.3	To describe about the mechanism of respiration, organs involved and the Urinary organs functions and diseases
BP 201 T.4	To classify hormones and its functions with special emphasis on hyper and hypo secretory conditions
BP 201 T.5	To improve knowledge on male and female reproductive system & its disorders. To understand genetic factors & its inheritance.

Course Name: Pharmaceutical Organic chemistry-I (Theory)Course Code:

BP202T, I B Pharmacy, Second Semester.

BP202T.1	To be able to understand the structure, nomenclature, and isomerism oforganic compounds.
BP202T.2	To learn about elimination reactions of alkanes, alkenes, and conjugateddienes and their stabilities.
BP202T.3	To understand the nucleophilic substitution reactions of alkyl halides and alcohols
BP202T.4	To learn about nucleophilic addition reactions of carbonyl compounds with mechanisms
BP202T.5	To understand the acidity of carboxylic acids, the basicity of aliphatic amines, and their identification tests.

Course Name: BIOCHEMISTRY (Theory)

Course Code: BP203 T, I B Pharmacy, Second Semester.

BP203T.1	To understand the biological role of major biomolecules, concept of bio energetics
BP203T.2	To attain the knowledge of Carbohydrates their metabolic pathways, metabolic disorders, hormonal regulation and also to understand the mechanism involved in the ETC.
BP203T.3	To gain the knowledge of the metabolic pathways and the disorders of the lipids and amino acid metabolism, also the synthesis of biological substances.

BP203T.4	To attain the knowledge of molecular biology and the models of DNA & RNA, metabolism and synthesis of proteins.
BP203T.5	To understand the catalytic activity of the enzymes in biochemical pathways and their importance in the diagnosis of diseases and in its treatment.

Course Name: Computer Applications (Theory) Course Code: BP 205 T, I B

Pharmacy, Second Semester.

BP 205T.1	To understand the fundamentals of computers and Apply the knowle**d**ge of mathematics
BP 205T.2	To understand the Programming languages and computing fundamentalsto pharmaceutical appl**i**cations for any given requirement.
BP 205T.3	To know the various types of applicatio**n** of computers in ph**a**rmacy
BP 205T.4	To **k**now the various types of databases
BP 205T.5	To know the various applic**a**tions Preclinical development of databases in pha**r**macy

Course Name: Environmental Sciences (Theory) Course Code: BP 206 T, I B

Pharmacy, Second Semester.

BP 206 T.1	They able to impart knowledge about the environment and its alliedproblems
BP 206 T.2	They came to know the various ecosystems and its functions

BP 206 T.3	They able to understand the concept of environmental pollution

Course Name- Human Anatomy and Physiology-II (Practical)Course code: BP

207 P, I. B.Pharmacy, Second Semester.

BP 207 P.1	To understand the physiological role of special senses & reflex activity of nervous system.
BP 207 P.2	To regulate the neurological activity & hormonal secretion by endocrinesystem
BP 207 P.3	To estimate the physiological capacity of eye & involuntary reflex activity
BP 207 P.4	To understand the Tidal capacity & Vital capacity of Lungs
BP 207 P.5	To determine the RBC and WBC in human blood.
BP 207 P.6	To estimate the DLC and ESR of human blood sample.

Course Name: Pharmaceutical Organic chemistry-I (Practical)Course Code:

BP208P, I B Pharmacy, Second Semester.

BP208P.1	To gain knowledge on general procedure of systematic qualitative analysis of unknown organic compounds
BP208P.2	To determine the melting point and boiling point of organic compounds
BP208P.3	To identify the unknown organic compounds using systematic qualitative analysis
BP208P.4	To prepare and calculate the percentage yields of some organic compounds
BP208P.5	To have knowledge on molecular models

Course Name: Biochemistry (Practical)

Course Code: BP 209P, I B Pharmacy, Second Semester.

BP209P.1	To analyze the carbohydrates, and observing their structures also toidentify proteins and abnormal constituents in urine.
BP209P.2	To estimate the creatinine, sugar, total cholesterol in blood.
BP209P.3	To gain practical knowledge to prepare buffers and how to measure theirpH.
BP209P.4	To know the hydrolysis of starch through enzymes.
BP209P.5	To determine the activity of salivary amylase.
BP209P.6	To study the effect of temperature and substrate concentration of salivary amylase.

Course Name: Computer Applications (Practical) Course Code: BP 210 P, I B

Pharmacy, Second Semester.

BP 210 P.1	Introduction to MS word, MS excel, MS power point, etc
BP 210 P.2	Describe how to design a HTML web page
BP 210 P.3	Retrieve the information of a drug and its adverse effects using onlinetools

BP 210 P.4	Work with MS access
BP 210 P.5	Exporting Tables, Queries, Forms and Reports to web pages and HTML
BP 210 P.6	Creating tables, databases regarding patient information

Course Name: Pharmaceutical Organic chemistry-II (Theory)Course Code:

BP301T , II B Pharmacy, Third Semester.

BP301T.1	To understand the structural evidence for benzene, its preparation and reactions
BP301T.2	To gain knowledge on preparations and reactions of phenols, aromaticamines, and aromatic acids.
BP301T.3	To learn about the properties and analytical constants of fats and oils
BP301T.4	To obtain information on the synthesis and reactions of polynuclear hydrocarbons
BP301T.5	To be able to understand the stability of cycloalkanes and proposed theories about the stabilities.

Course Name: Physical Pharmaceutics I (Theory) Course Code: BP 302 T, II

B Pharmacy, Third Semester.

BP 302T.1	Describe the properties of solutions with different solubility expressionsand determine the solubility of drugs
BP 302T.2	State the physic chemical properties of drug molecules and understand the types of states of matter relevant to pharmaceutical dosage forms
BP 302T.3	Understand the role of surface active agents, interfacial phenomena of solid-gas, solid-liquid, and liquid-liquid interface, and understand the idea of adsorption isotherm
BP 302T.4	To determine the properties of powders and apply them in formulation development.
BP 302T.5	Describe detailed ideas of complexation of drug action and drug protein binding
BP 302T.6	Understand the methods of tonicity adjustment of biological fluids and pH determinations

Course Name: Pharmaceutical Microbiology (Theory)Course Code: BP 303T, II

B Pharmacy, Third Semester.

BP 303T.1	To introduce biological evaluation and role of bacteria, classification, cultivation methods and identification of Bacteria. Quantification of bacteria
BP 303T.2	Identification of Bacteria by physical staining and biochemical properties. Sterilization methods to control microbes.
BP 303T.3	To develop disinfectant agents and its mechanism of action on bacteria and fungi
BP 303T.4	To control microbial contamination in pharmaceutical industry. To use bacteria to assess the concentration of unknown chemicals.
BP 303T.5	To evaluate microbial spoilage and methods to control spoilage and use of preservatives. To study bacteriostatic and bactericidal effects of new compounds. Use of Cell lines culture in Pharmacy

Course Name: Pharmaceutical Engineering (Theory) Course Code: BP 304 T, II

B Pharmacy, Third Semester.

BP 304T.1	Know the principle, construction, working, uses, advantages and disadvantages of pharmaceutical equipment's used for various types of unit operations.
BP 304T.2	Understand the concepts of heat transfer by conduction, convection & radiation.
BP 304T.3	Know the principle, construction, working, uses, advantages and disadvantages of drying and mixing.
BP 304T.4	Know the principle, construction, working, uses, advantages and disadvantages of filtration and centrifugation.
BP 304T.5	Know the various preventive methods used for corrosion control in pharmaceutical industries.

Course Name: Pharmaceutical Organic chemistry-II (Practical)Course Code: BP305P , II B Pharmacy, Third Semester.

BP305P.1	To gain knowledge on laboratory purification techniques.
BP305P.2	To determine the various analytical constants of oils
BP305P.3	To prepare the various organic compounds.
BP305P.4	To calculate the percentage yield of synthesized organic compounds

Course Name: Physical Pharmaceutics I (Practical) Course Code: BP 306 T, II B Pharmacy, Third Semester.

BP 306P.1	To understand the concept of surface tension
BP 306P.2	To understand the solubility of drugs at different temperatures
BP 306P.3	To access the HLB value and critical micellar concentration
BP 306P.4	Explain the complexation phenomena
BP 306P.5	To study the adsorption of oxalic acid on charcoal

Course Name: Pharmaceutical Microbiology (Practical)Course Code: BP 307T,

II B Pharmacy, Third Semester.

BP 307P.1	Understand the different equipments and processing used in experimental microbiology.
BP 307P.2	Determine the sterilization of glassware, preparation, sterilization of media, sub culturing of bacteria and fungus. Nutrient stabs and slants preparations
BP 307P.3	Perform the methods of Simple, Gram's staining and acid fast staining.
BP 307P.4	Isolate the pure culture of micro-organisms by multiple streak plate technique.
BP 307P.5	Determine the Microbiological assay of antibiotics by cup plate method, Motility determination by Hanging drop method

Course Name: Pharmaceutical Engineering (Practical)Course Code: BP 308 P,

II B Pharmacy, Third Semester.

BP 308P.1	To know various unit operations used in pharmaceutical industries.
BP 308P.2	To Understand the material handling techniques.
BP 308P.3	To perform various processes involved in pharmaceutical manufacturing process.
BP 308P.4	To carry out various tests to prevent environmental pollution.

BP 308P.5	To appreciate the various preventive methods used for corrosion controlin pharmaceutical industries.

PROGRAMME: B.PHARMACY (COURSE OUTCOMES)

Course Name: Pharmaceutical Organic chemistry-III (Theory)Course Code:

BP401T, II B Pharmacy, Fourth Semester.

BP401T.1	To get knowledge on stereoisomerism and asymmetric synthesis
BP401T.2	To be able to understand geometrical isomerism and its types
BP401T.3	To attain knowledge on the classification of heterocyclic compounds
BP401T.4	To obtain information on nomenclature, synthesis reactions, and medicinal uses of specific heterocyclic compounds
BP401T.5	To learn the various named reactions.

Course Name: Medicinal Chemistry-I (Theory) Course Code: BP402T, II B

Pharmacy, Fourth Semester.

BP402T.1	To understand the basics of medicinal chemistry and physicochemical properties of drugs and their metabolism
BP402T.2	To get the knowledge on classification, mechanisms, uses, and SAR of drugs acting on the autonomic nervous system

BP402T.3	To be able to classify cholinergic neurotransmitters and theirmechanism and uses
BP402T.4	To obtain information on various drugs like sedatives, hypnotics, antipsychotics, and anticonvulsants belonging to the central nervous system
BP402T.5	To learn about the other drugs acting on the central nervous system like general anaesthetics, narcotic and non-narcotic analgesics, anti-inflammatory agents.

Course Name: Physical Pharmaceutics II (Theory) Course Code: BP 403 T, II B Pharmacy, Fourth Semester.

BP 403T.1	Define the concepts of colloids and its phases and types with the application of its properties like optical, kinetic and electrical
BP 403T.2	Demonstrate the concepts and factors influencing the viscosity of liquid and explain the Rheology of fluids
BP 403T.3	Describe the settling and sedimentation theory and calculate sedimentation rates, define emulsions and its theories with formulation and stability
BP 403T.4	To determine the properties of powders and apply them in formulation development.
BP 403T.5	Calculate the expiration date of different dosage forms and describe the accelerated stability studies
BP 403T.6	To make the use of principles of kinetics in the stabilization of dosage forms.

Course Name- Pharmacology-I (Theory) Course code: BP 404-T, II.B.Pharm, Fourth Semester.

BP 404 T-1	To understand the basic terminology of Pharmacology, Drug receptor interaction & Pharmacokinetics
BP 404 T-2	To describe the pharmacodynamics, receptor families and drug interactions
BP 404 T-3	To gain knowledge on peripheral nervous system and its functions, Mechanism of local anesthetics
BP 404 T-4	To classify types of general anesthetics & centrally acting drugs

BP 404 T-5	To improve knowledge on treatment for antipsychotics and neuronal diseases.

Course Name: Pharmacognosy and Phytochemistry I (Theory)Course Code: BP 405 T, II B Pharmacy, Fourth Semester.

BP 405T.1	Study of pharmacognosy, Scope, Source of drugs, Classification andquality control of drugs of natural origin
BP 405T.2	To Know different methods of cultivation, collection, processing & Storage of crude drugs. Knowledge on conservation of medicinal plants.
BP 405T.3	To understand the techniques involved in plant tissue culture,applications of plant tissue culture and edible vaccines.
BP 405T.4	Knowledge on Various systems of medicine, Ayurveda, Unani, siddha, Homeopathy. Secondary metabolite's, introduction and identification
BP 405T.5	To understand pharmacognosy of fibers, hallucinogens, carbohydrates, proteins, enzymes, lipids and marine drugs.

Course Name: Medicinal Chemistry-I (Practical) Course Code: BP406P, II B Pharmacy, Fourth Semester.

BP406P.1	To prepare various drugs and intermediates
BP406P.2	To calculate the percentage yield of synthesized organic compounds
BP406P.3	To be able to do the assay of various drugs and to calculate their percentage purity
BP406P.4	To determine the partition coefficient of drugs

Course Name: Physical Pharmaceutics II (Practical) Course Code: BP 407 P, II B Pharmacy, Fourth Semester.

BP 407P.1	Determine the Particle size and its distribution by using Optical microscopy and sieving methods
BP 407P.2	To make use of derived and flow properties of powders to ensure a stable solid formulation.
BP 407P.3	Explain and determine the Methods of sedimentation volume by using the different suspending agents and concentration of same suspendingagents.
BP 407P.4	To determine the viscosity using Ostwald's and Brookfield's viscometer.
BP 407P.5	Determine the reaction rate constants by first and second order reactions by using graphical and substitution methods
BP 407P.6	Calculate the expiration date of different dosage forms and describe the accelerated stability studies.

Course Name- Pharmacology-I (Practical) Course code: BP 408-P, II B.Pharm, Fourth Semester.

BP 408 P-1	To understand the instruments & animals used in experimental pharmacology as per CPCSEA Guidelines
BP 408 P-2	To gain knowledge on laboratory blood withdrawal techniques while using anesthetics
BP 408 P-3	To improve knowledge on routes of administration by observing the drug effect on animals
BP 408 P-4	To understand the stereotype & anti catatonic activity on mice
BP 408 P-5	To determine the local anesthetic activity by different methods

BP 408 P-6	To estimate the effect microsomal enzyme inducers

Course Name: Pharmacognosy and Phytochemistry I (Practical)Course Code: BP 409 P, II B Pharmacy, Fourth Semester.

BP 409 P.1	To understand the techniques involved in analysis of crude drugs by chemical test
BP 409 P.2	To understand principle and procedure involved in stomatal index andvein termination number
BP 409 P.3	To gain Knowledge on determination of size of starch grains, Calcium oxalates by eyepiece micrometer. Lycopodium spore method
BP 409 P.4	To understand about Determination of fiber length & Width
BP 409 P.5	To gain Knowledge on principle and procedure involved in determination of ash value and extractive value
BP 409 P.6	To gain Knowledge on principle and procedure involved in determination of moisture content, swelling index and foaming index

Course Name: Pharmacognosy and Phytochemistry II (Theory)Course Code: BP 504 T, III B Pharmacy, Fifth Semester.

BP 504T.1	To gain knowledge on metabolic pathways in higher plants and their determination, utilization of radioactive isotopes in investigation of biogenetic studies.
BP 504T.2	To understand about composition, chemistry, chemical classes, bio sources, therapeutic uses and commercial applications of secondary metabolites.
BP 504T.3	To know isolation, identification and analysis of phytoconstituents
BP 504T.4	To understand the techniques in Industrial production, estimation and utilization of Phytoconstituents
BP 504T.5	To gain knowledge on basics of phytochemistry like extraction methods, spectroscopy and chromatography.

Course Name: Pharmacognosy and Phytochemistry II (Practical)Course Code: BP 508 P, II B Pharmacy, Fifth Semester.

BP 508P.1	To identify crude drugs by morphology, histology and powder characteristics of crude drugs
BP 508P.2	To isolate and detect active principles from crude drugs
BP 508P.3	To perform paper and thin layer chromatography
BP 508P.4	To Know the distillation procedures of volatile oils and their detection by TLC
BP 508P.5	To analyze crude drugs by chemical tests.

Course Name: Herbal Drug Technology (Theory) Course Code: BP 603 T, III B Pharmacy, Sixth Semester.

BP 603T.1	To understand about herbs as raw materials their selection, identification and authentication, biodynamic agriculture & Indiansystems of medicine.
BP 603T.2	To describe benefits of various neutraceuticals in ailments, study of herb-drug and herb-food interactions
BP 603T.3	To Know about preparation of herbal cosmetics, herbal excipients and herbal formulations
BP 603T.4	To describe the rules and regulations in evaluation of drugs, patentingand regulatory requirements and regulatory issues of natural origin

BP 603T.5	To explain present status and future prospects of herbal industry and components for good manufacturing practice of Indian system of medicine

Course Name: Herbal Drug Technology (Practical) Course Code: BP 609 P, III B Pharmacy, Sixth Semester.

BP 609P.1	To gain knowledge on preliminary phytochemical screening of crude drugs.
BP 609P.2	To know the principle and procedure involved in determination of alcohol content of asva and arista
BP 609P.3	To evaluate excipients of natural origin
BP 609P.4	To gain knowledge on Procedures involved in incorporation of herbal extract.
BP 609P.5	To describe the monograph analysis of herbal drugs from recent pharmacopoeias
BP 609P.6	To know the principle and procedure involved determination of aldehyde content, phenol and total alkaloid content.

Course Name: Medicinal Chemistry-II (Theory) Course Code: BP501T, III B Pharmacy, Fifth Semester.

BP501T.1	To understand the anti-histaminic agents and their classification, mechanism of action, and uses.
BP501T.2	To get the knowledge on classification, mechanisms, uses, and SAR of Antineoplastic agents
BP501T.3	To attain knowledge on anti-anginal drugs, diuretics, and anti-hypertensive agents
BP501T.4	To obtain information on various drugs like anti-arrhythmic agents, antihyperlipidemic agents, coagulants, and also drugs used in congestive heart failure
BP501T.5	To learn about the drugs acting on endocrine system
BP501T.6	To understand the antidiabetic agents, local anesthetics their classification, mechanisms, and uses

Course Name: Industrial Pharmacy I (Theory) Course Code: BP 502 T, III B Pharmacy, Fifth Semester.

BP 502T.1	To outline the objectives and applications of preformulation studies in the development and stability of dosage forms
BP 502T.2	Describe tablets dosage form, physic-chemical principles, different additives used for formulation, manufacturing, evaluation and defect in tableting and tablet coating with remedies.
BP 502T.3	To review the formulation and manufacturing considerations of liquid orals.
BP 502T.4	Describe capsule dosage form. Explain the different types, additives, size selection, manufacturing, evaluation, equipment and defect of capsules.
BP 502T.5	To describe the preparation and quality control of parenterals and ophthalmic preparations.
BP 502T.6	To summarize formulation, manufacturing and evaluation of cosmetic preparations, pharmaceutical aerosols and appraise the science of packaging materials.

Course Name- Pharmacology-II (Theory) Course code: BP 503-T, III.B.Pharm, Fifth Semester

BP 503 T.1	To Understand the mechanism of drug action and its relevance in the treatment ofdifferent cardio vascular diseases
BP 503 T.2	To gain knowledge on Pharmacotherapy of shock, coagulants and anticoagulants, Plasma Volume expanders
BP 503 T.3	To describe about different autocoids & to understand the use of NSAIDSin Gout & Rheumatoid arthritis.
BP 503 T.4	To improve knowledge on different hormones, Anti- diabetic drugs & Adreno corticosteroids
BP 503 T.5	To understand the basic principle, types & applications of differentbioassay procedures.

Course Name: Pharmacognosy and Phytochemistry II (Theory)Course Code: BP 504 T III B

Pharmacy Fifth Semester

BP 504T.1	To gain knowledge on metabolic pathways in higher plants and their determination, utilization of radioactive isotopes in investigation of biogenetic studies.
BP 504T.2	To understand about composition, chemistry, chemical classes, bio sources, therapeutic uses and commercial applications of secondary metabolites.
BP 504T.3	To know isolation, identification and analysis of phytoconstituents
BP 504T.4	To understand the techniques in Industrial production, estimation and utilization of Phytoconstituents
BP 504T.5	To gain knowledge on basics of phytochemistry like extractionmethods, spectroscopy and chromatography.

Course Name: PHARMACEUTICAL JURISPRUDENCE(Theory)

Course Code: BP 505 T, III B Pharmacy, Fifth Semester.

BP 505 T.1	They understand the concepts of drugs and cosmetics act which includes the schedules of the act, importing and manufacturing of drugs with specific licenses and various test for drugs.
BP 505 T.2	They understand the concepts of drugs and cosmetics act which includes the study of various schedules along with sales of drugs, labelling and packing of drugs and administration of the act
BP 505 T.3	They obtain the knowledge on pharmacy act; medicinal and toilet preparations act along with narcotic and psychotropic substances act

BP 505 T.4	They came to know the salient features of drugs and magic remedies act including drug price control order and prevention of cruelty to animals' act.
BP 505 T.5	They attain knowledge on pharmaceutical legislations, pharmaceutical ethics, medical termination of pregnancy act, right to information act and Intellectual property rights.

Course Name: Industrial Pharmacy I (Practical) Course Code: BP 506 P, III B Pharmacy, Fifth Semester.

BP 506 P.1	To interpret the preformulation studies on drugs.
BP 506 P.2	To explain the preparation, evaluation and coating of tablets.
BP 506 P.3	To illustrate the formulation and evaluation of capsules.
BP 506 P.4	To design parenteral and ophthalmic products.
BP 506 P.5	To describe the preparation of creams.
BP 506 P.6	To evaluate glass containers as per pharmacopeial specifications.

Course Name- Pharmacology-II (Practical) Course code: BP 507-P, III.B.Pharmacy, Fifth Semester.

BP 507 P.1	To understand the techniques involved in In-Vitro pharmacology & different types physiological salt solutions
BP 507 P.2	To study & regulate the effect of drug on heart rate of different animals
BP 507 P.3	To determine the effect of PA2 & PD2 value of drugs using isolate tissue of animal by different methods
BP 507 P.4	To study the effect of drugs on different analgesic and anti-inflammatory methods
	To gain knowledge on Different types of Multiple point bioassay techniques using tissue preparations

BP 507 P.5	
BP 507 P.6	To study the effect of spasmogens and spasmolytics on rabbit jejunum preparation

Course Name: Pharmacognosy and Phytochemistry II (Practical)

Course Code: BP 508 P III B Pharmacy Fifth Semester

BP 508P.1	To identify crude drugs by morphology, histology and powder characteristics of crude drugs
BP 508P.2	To isolate and detect active principles from crude drugs
BP 508P.3	To perform paper and thin layer chromatography
BP 508P.4	To Know the distillation procedures of volatile oils and their detection by TLC
BP 508P.5	To analyze crude drugs by chemical tests.

Course Name: Medicinal Chemistry-III (Theory) Course Code: BP601T, III B Pharmacy, Sixth Semester.

BP601T.1	To understand the antibiotics classification, mechanisms, and SARs.
BP601T.2	To get knowledge on the chemistry of drugs with respect to their biological activity
BP601T.3	To learn about antitubercular and antiviral agents and their classifications
BP601T.4	To obtain information on various drugs including antifungal agents, anthelmintics
BP601T.5	To understand the importance of drug design and different techniques of drug design.

BP601T.6	To Know the metabolism, adverse effects, and therapeutic value of drugs.

Course Name- Pharmacology-III (Theory) Course code: BP 602-T, III.B.Pharm, Sixth Semester.

BP 602 T-1	To Understand the mechanism of drug action for different dyugs acting on respiratory disorders
BP 602 T-2	To improve knowledge on principles of drugs acting on treatment of Ulcer and other GIT disorders
BP 602 T-3	To describe about different general principles of Chemotherapy and treatment for different anti-infective agents.
BP 602 T-4	To improve knowledge on Anticancer treatments, Immunosuppressants, and modulators, Monoclonal antibodies
BP 602 T-5	To understand the basic principles involved in toxicological and chronopharmacological study of different drugs

Course Name: Herbal drug technology (Theory) Course Code: BP 603 T III B Pharmacy Sixth Semester

BP 603T.1	To understand about herbs as raw materials their selection, identification and authentication, biodynamic agriculture & Indian systems of medicine.
BP 603T.2	To describe benefits of various neutraceuticals in ailments, study of herb-drug and herb-food interactions
BP 603T.3	To Know about preparation of herbal cosmetics, herbal excipients and herbal formulations
BP 603T.4	To describe the rules and regulations in evaluation of drugs, patenting and regulatory requirements and regulatory issues of natural origin
BP 603T.5	To explain present status and future prospects of herbal industry and components for good manufacturing practice of Indian system of medicine

Course Name: Biopharmaceutics and pharmacokinetics (Theory)Course code: BP 604 T, B Pharmacy, Sixth semester

BP 604T.1	Understand the concept of ADME of drug in human body.
BP 604T.2	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 (IVIVC).
BP 604T.3	To apply the pharmacokinetic models for determination of various pharmacokinetic parameters.
BP 604T.4	Ability to calculate the various pharmacokinetic parameters by usingvarious mathematical models.
BP 604T.5	To analyze the pharmacokinetic parameters of drugs that follows linear and nonlinear pharmacokinetics.

Course Name: Pharmaceutical Biotechnology (Theory)Course code: BP 605 T, B Pharmacy, Sixth semester

BP 605T.1	Role of enzymes in protein engineering and genetic engineering
BP 605T.2	Cloning and rDNA technology procedures
BP 605T.3	Role of Immunity in disease progression
BP 605T.4	Diagnostic procedure in different diseases
BP 605T.5	Industrial production of pharmaceutical products by using fermentation

Course Name: Pharmaceutical Quality Assurance (Theory)Course Code: BP 606T, III B Pharmacy, Sixth Semester.

BP 606T.1	Understand the cGMP protocol in pharmaceutical industry set up.
BP 606T.2	Have knowledge on the importance of documentation, Stability testing of drug and drug substances, Statistical approaches for quality control.
BP 606T.3	Has the knowledge of quality certifications applicable to pharmaceutical industries
BP 606T.4	Have Understood the responsibilities of QA & QC departments in Pharmaceutical Industry.
BP 606T.5	Have knowledge on ISO management systems and Tools for quality improvement
BP 606T.6	Have Understood the types of validation and importance of validation in ensuring the quality attributes.

Course Name: Medicinal Chemistry-III (Practical) Course Code: BP607P, III B Pharmacy, Sixth Semester.

BP607P.1	To prepare various drugs and intermediates
BP607P.2	To assay various drugs and to calculate their percentage purity
BP607P 3	To synthesize the drugs by microwave irradiation techniques

BP607P.4	To be able to draw the structures by chem draw software
BP607P.5	To determine the Physicochemical properties of drugs

Course Name- Pharmacology-III (Practical) Course code: BP 608-P, III.B.Pharm, Sixth Semester.

BP 608 P-1	To identify the dose calculation range in pharmacological experiments
BP 608 P-2	To study & regulate the effect of anti ulcer activity & anti allergic activity
BP 608 P-3	To determine the effect of drug by acute oral toxicity, skin irritation
BP 608 P-4	To estimate the effect of serum bio-chemical parameters by semi-auto analyzer
BP 608 P-5	To gain knowledge on biostatistics methods used in experimental pharmacology
BP 608 P-6	To study the effect of Agonist & Antagonistic drugs on different isolated tissue preparations

Course Name: Herbal drug technology (Practical) Course Code: BP 609 P III B Pharmacy Sixth Semester

BP 609P.1	To gain knowledge on preliminary phytochemical screening of crude drugs.
BP 609P.2	To know the principle and procedure involved in determination of alcohol content of asva and arista
BP 609P.3	To evaluate excipients of natural origin
BP 609P.4	To gain knowledge on Procedures involved in incorporation of herbal extract.
BP 609P.5	To describe the monograph analysis of herbal drugs from recent pharmacopoeias

BP 609P.6	To know the principle and procedure involved determination of aldehyde content, phenol and total alkaloid content.

Course Name: Industrial Pharmacy II (Theory) Course code: BP 702T, B Pharmacy, Seventh semester

BP 702T.1	To acquire the knowledge on process of pilot plant scale up techniques usedin pharmaceutical dosage forms
BP 702T.2	To understand technology transfer protocol and licensing and relatedissues
BP 702T.3	To have deep knowledge on regulatory aspects of drug approval, clinical research and management of clinical studies
BP 702T.4	To learn the quality management system and standards, NABL,GLP
BP 702T.5	To acquire knowledge on Indian regulatory requirements, CDSCO, COPP
BP 702T.6	To know the acts and laws that regulates pharma industry

Course Name: Pharmacy Practice (Theory) Course Code: BP 703T, IV B Pharmacy, Seventh Semester.

BP 703T.1	Students should know about various drug distribution methods in a hospital and should have the knowledge regarding stores managementand inventory control.
BP 703T.2	Students should able to monitor drug therapy of patient through medication chart review and clinical review.
BP 703T.3	Students should able to obtain the medication history interview and counsel the patients.
BP 703T.4	Students should able to identify the drug related problems and must ableto assess the adverse drug reactions.
BP 703T.5	Students should able to interpret the selected laboratory results (as monitoring parameters in therapeutics) of specific disease states.
BP 703T.6	Students should able to understand the pharmaceutical care services.

Course Name: Novel Drug Delivery Systems (Theory)Course code: BP 704T, B Pharmacy, Seventh semester

BP 704 T.1	Explain the principles and technology used in the design of controlled release drug delivery system and learns the criteria for selection of polymers for the development of Novel drug delivery system.
BP 704 T.2	Explain the principles and technology used in the design of Mucosal drug delivery system and Implantable drug delivery system.
BP 704 T.3	Explain the formulation and characterization of transdermal drug delivery systems. And learn the formulation and evaluation of Gastro retentive & Nano pulmonary drug delivery systems
BP 704 T.4	Discuss various approaches for the development of targeted drug delivery system.
BP 704 T.5	Explain development of ocular formulations and intra uterine devices (IUDs) and its applications.

Course Name: Instrumental methods of Analysis (Practical) Course code: BP705P, IV. B .Pharmacy, Seventh Semester.

BP705P.1	To learn the concepts of quantitative estimation techniques.
BP705P.2	To gain knowledge of handling of the instruments like HPLC, GC.
BP705P.3	To apply the concepts of separation methods for sugars, amino acids, pigments etc.,

BP705P.4	To have a knowledge on qualitative determination of organic compounds
BP705P.5	To be able to perform assay of dosage forms by the application of UV/Vis spectrophotometry

Course Name: Pharmacovigilance (Theory) Course Code: BP 805ET, IV B Pharmacy, Eight Semester.

BP 805ET.1	Student should able to relate the role of pharmacovigilance and its prevalence in different setups.
BP 805ET.2	Student should able to discuss the different facets of ADRs in normal as well as special populations with their relation to pharmacovigilance methods.
BP 805ET.3	Student should able to integrate the knowledge of resources of drug information, safety data and drug utilization.
BP 805ET.4	Student should able to outline the regulatory processes in pharmacovigilance.
BP 805T.5	Student should be able to know the ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning and CIOMS forms.

Course Name: Advanced Instrumentation Techniques (Theory) Course Code: BP 811ET, IV B Pharmacy, Eighth Semester.

BP 811ET.1	Have good understanding of the basic concept and instrumentation of NMR, MS, X-ray crystallography, Thermal methods, Radio immunoassays and extraction technique for identification, and characterization of compounds.

BP 811ET.2	Possess in-depth knowledge on principles and instrumentation of hyphenated techniques like LCMS/MS, GC-MS/MS, HPTLC-MS.
BP 811ET.3	Able to perform quantitative & qualitative analysis of drugs using theabove-mentioned instruments.
BP 811ET.4	Able to perform the calibration and validation of UV, IR, HPLC as per ICH guidelines
BP 811ET.5	Understand the principle and able to perform the solid phase and liquidphase extractions.
BP 811ET.6	Able to perform basic interpretation of NMR Results.

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(Approved by AICTE & PCI, New Delhi)
Old G.N.T. Road, Santhi Nagar, ELURU-534 007, ELURU DIST., ANDHRA PRADESH
☎ : 08812-231492
Mob : 73821 64545
College Code : CRRP
Website : www.sircrrcops.edu.in
E-mail : sircrreddypharmacy@gmail.com

B PHARM PROGRAM OUTCOMES

PO 1: Exhibit and understand the fundamental concepts and knowledge pertaining to the field of pharmacy

PO 2: Learn the synthesis, formulation, analysis and pharmacological aspects of natural and synthetic drugs

PO 3: To inculcate the development of research activities for new drug discovery on natural and synthetic molecules

PO 4: Highlight the concepts for the benefit of academicians and to emphasize the concepts of community pharmacy and related areas of pharmacy with a focus on modern medications

PO 5: Apply necessary methods and protocols related to modern pharmacy computing

tools.PO 6: Exhibit personal values & professional roles in social context of the

society.

PO 7: Create qualified pharmacist with strong technical and scientific skills for competing in pharmaceutical and health care industry.

PO 8: Apply moral principles that commit to professional ethics and abide by pharmacy standards.

PO 9: Employ pharmaceutical techniques and procedures that have an impact on the social environment to support sustainable development with knowledge and responsibility.

PO 10: Develop entrepreneurial abilities that will enable the expansion of the pharmaceuticalindustry and related services which will promote economic growth.

PO 11: Recognize the need for training and aptitude as self sufficient and lifelong learning alongwith the ability to foster a talent for perpetual professional development.

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College Code : CRRP
Website : www.sircrrcops.edu.in
E-mail : sircrreddypharmacy@gmail.com

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 steam 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 ofl iquid, 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 andtheir 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 thefield 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 able to describe the etiology and pathogenesis of the selecteddisease states.
PD 2.1T.2	Students should able to name the signs and symptoms of the diseases.
PD 2.1T.3	Students should able to explain the concept of cell injury, inflammation, immunity and cancers.
PD 2.1T.4	Students should 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 drugsby 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 able to interpret and analyse the selected laboratory results of specific disease states.
PD 2.6T.4	Students should able to describe the therapeutic approach to manage the selected diseases.
PD 2.6T.5	Students should able to discuss the rationale for drug therapy.
PD 2.6T.6	Students should 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 able to describe the pathophysiology and management of cardiovascular, respiratory and endocrine diseases.
PD 2.6P.2	Student should able to develop the patient case-based assessment skills.
PD 2.6P.3	Student should able to describe the quality use of medicines issues surrounding the therapeutic agents in the treatment of diseases.
PD 2.6P.4	Student should able to develop clinical skills in the therapeutic management of disease conditions.
PD 2.6P.5	Student should able to develop communication skills.
PD 2.6P.6	Student should 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 thedifferent 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 Ka, Ke, Half-life, Cmax, 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 & PHARMACOTHERAPEUTICDRUG 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.

SIR C.R.REDDY COLLEGE OF PHARMACEUTICAL SCIENCES
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PROGRAM OUTCOMES - PHARM D

PO 1: Demonstrate knowledge of pharmacy practice and the ability to acquire, manage and use current information for problem solving, patient-specific, population-specific, evidence-based care to promote safe and optimal pharmacotherapy outcomes.

PO 2: Identify the rules and regulations involved in the drug discovery and development, distribution, sale and safe use of medicines and participate in the development of drug use policy.

PO 3: Apply critical thinking skills, including investigation, application, analysis, creativity, synthesis and evaluation of information, data and documents related to drug, poison, clinical investigations, pharmaceutical care and practices.

PO 4: Develop problem-based learning approach and analytical thinking in his/her academic and professional life.

PO 5: Demonstrate the ability to plan and implement professional activities.
PO 6: Act efficiently as a leader in the diverse areas of the profession.
PO 7: Write, interpret and communicate effectively and scientifically.
PO 8: Apply the knowledge and skills gained through education to gain recognition in professional circle and society.

PO 9: Partnering with other health care communities to provide innovative solutions.
PO 10: Create awareness in society about the effective and safe use of medicines.
PO 11: Demonstrate eco-friendly products and processes to maintain public health.
PO 12: Imbibe ethical practices and moral values in personal and professional endeavors.
PO 13: Identify and implement cost-effective patient care and resource management practices that do not compromise quality of care.

PO 14: Tackle future challenges through lifelong learning.

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M PHARM COURSE OUTCOMES

PROGRAMME: M.PHARMACY-PHARMACOLOGY (COURSE OUTCOMES)

Course Name: Modern Pharmaceutical Analytical Techniques (Theory)Course Code: MPL 101 T, I M Pharmacy, First Semester.

MPL 101 T.1	Understand the UV-Visible spectroscopy, IR, flame and atomic absorption spectroscopy.
MPL 101 T.2	Know principles of NMR spectroscopy, instrumentation and applications.
MPL 101 T.3	Understand the principles of mass spectroscopy, different ionization techniques and applications of mass spectroscopy.
MPL 101 T.4	Know the principles and procedures of paper and capillary electrophoresis; XRD and its applications.
MPL 101 T.5	Understand the principles and procedures of immunoassays like radioimmunoassay, ELISA and bioluminescent assays.

Course Name- Advanced Pharmacology-I (Theory) Course code: MPL 102-T, I.M.Pharm, First Semester.

MPL 102 T-1	To Understand the basic concepts of pharmacokinetics, structural &functional quantification of drug receptors
MPL 102 T-2	To gain knowledge on drugs acting on peripheral nervous system based on its mechanism of action & pharmacology of local anesthetics
MPL 102 T-3	To describe about concept of drugs acting on central nervous system with receptor pathways & pharmacological study of general anesthetics, opioids & non-opioids
MPL 102 T-4	To improve knowledge on cardiovascular system and drugs which are used in the treatment of its disorders as Angina, arrhythmia, hyperlipidemics
MPL 102 T-5	To study the concept of neurodegenerative disorders & free radical induced disorders

Course Name- Pharmacology-I (Practical) Course code: MPL 105-P,
I.M.Pharm, First Semester.

MPL 105 P-1	To study the enzyme based In-Vitro assays pharmacological experiments
MPL 105 P-2	To understand the techniques involved in animal handling & various routes of drug administration
MPL 105 P-3	To study & observe the theory involved in enzyme induction & inhibition activity.
MPL 105 P-4	To study the effect of pharmacokinetics & data analysis of drug by different routes of drug administration in software method
MPL 105 P-5	To gain knowledge on predictions involved of drug-drug interactions by pharmacological software
MPL 105 P-6	To estimate the effect of drug extraction from various biological samples by using different analytical techniques

Course Name- Pharmacology-II (Practical) Course code: MPL 106-P,
I.M.Pharm, First Semester.

MPL 106 P-1	To Understand physiological observation effects of battery tests
MPL 106 P-2	To evaluate the effects of drugs which are used as CNS Stimulants, anti-convulsant activity
MPL 106 P-3	To study & evaluate the effects of pharmacological drugs like analgesics & anti inflammatory
MPL 106 P-4	To improve knowledge on estimation of the strength of lipid parameter in blood sampling _& tissues.
MPL 106 P-5	To study the evaluation of anti-diuretic activity & anti- ulcer activity

Course Name- Pharmacological & Toxicological Screening Methods (Theory)Course code: MPL 202-T, I.M.Pharm Second Semester.

MPL 202 T-1	To justify the rules and regulations pertaining to animal studies like CPCSEA, OECD, ICH, EPA guidelines, Good laboratory practice
MPL 202 T-2	To understand various screening techniques involved in CNS drugs
MPL 202 T-3	To justify the Pharmacological screening procedures of drugs acting on Respiratory and gastrointestinal systems.
MPL 202 T-4	To know about Preclinical screening of new substances for the pharmacological activity related to cardio vascular drugs
MPL 202 T-5	To gain knowledge on Teratogenicity, genotoxicity (Ames test, in vitro, in vivo micronucleus, chromosomal aberrations) carcinogenicity

Course Name- CLINICAL RESEARCH AND PHARMACOVIGILANCE (Theory)
Course code: MPL 204-T, I.M.Pharm Second Semester.

MPL 202 T-1	To justify Clinical trials Regulatory perspectives like Good Clinical Practice (ICH-GCP) guidelines, - Schedule Y. ICMR
MPL 202 T-2	To understand Cohort, case control, cross sectional clinical trial study - Team roles andresponsibilities of clinical trial personnel
MPL 202 T-3	To understand Clinical trial documentation like preparation of documents protocol, Investigator Brochure, Case Report Forms, Clinical Study Report etc. To study Clinical trial monitoring Safety, adverse drug reactions, Severity and seriousness assessment.
MPL 202 T-4	To know about Basic terminologies of pharmacovigilance, WHO international drug monitoring programme, WHO and Regulatory terminologies of ADR, Statistical methods for evaluating medication safety data
MPL 202 T-5	To gain knowledge on Pharmacoepidimology and pharmacoeconomic Definition and scope, outcomes, evaluation and applications methods

Course Name: Pharmacokinetics and Drug Metabolism (Theory);Course code: MPL 103T, I M.PHARM, First Semester

MPL 103T.1	To understand more about biological membranes, role of P-glycoprotein, factors affecting drug absorption and distribution kinetics.
MPL 103T.2	To gain more knowledge on Microsomal, non-microsomal biotransformation of drugs, cytochrome P450 enzymes substrates, inducers and inhibitors. Stressing on Physiological, pathological and genetic factors affecting drug metabolism
MPL 103T.3	To elaborate the concept of excretion, its factors and information related to enterohepatic recirculation, significance of elimination rate constant, elimination half-life
MPL 103T.4	To clear the concepts related to pharmacokinetics, population pharmacokinetic, PK-PD modeling and therapeutic drug monitoring.
MPL 103T.5	To understand the concept of drug-drug interactions and factors which causes drug food interactions
MPL 103T.6	To update knowledge on alternative methods to animal toxicity studies and know more on evaluation in pre-clinical studies and its importance.

Course Name: CELLULAR AND MOLECULAR PHARMACOLOGY (Theory)
Course Code: MPL 104T, I M.PHARM, First Semester.

MPL 104T.1	To emphasize the concept on genome organization, regulation mapping and more on Cell cycles regulation, apoptosis program, Necrosis andautophagy
MPL 104T.2	To explain the various receptors and their secondary messengers and focusing on various signaling pathways.
MPL 104T.3	To update the knowledge on recombinant DNA technology, techniques involved in gene therapy, applications and advances in it.
MPL 104T.4	To elaborate Genetic variation and its effects in drug metabolism, Gene mapping and cloning of disease gene.
MPL 104T.5	To comprehends the concept of cell cultures, basic equipment used in cell culture and their applications.
MPL 104T.6	To gain the knowledge on different assays like cell viability, glucose uptake, calcium influx and know more on Biosimilars and applications of flow cytometry.

Course Name: ADVANCED PHARMACOLOGY II (Theory)Course Code:

MPL 201T, I M.PHARM, Second Semester.

MPL 201T.1	To give more explanation for antibacterial resistance and different antibiotics β – lactams, aminoglycosides, tetracyclins, chloramphenicol, macrolide, antibacterial and anthelmintics.
MPL 201T.2	To elaborate more on Drugs acting on cancer, viral and fungal diseases. Imparting knowledge on immunosupressants, and disorders related to Immune system.
MPL 201T.3	To provide updated concepts on Endocrine hormones, drugs acting on hormonal abnormalities. Stressing role of corticosteroids and calcium regulation.
MPL 201T.4	To gain knowledge on drugs acting on intestinal disorders, points related to Respiratory disorders namely asthma and COPD
MPL 201T.5	To know more on Physiological and pathological role of Autacoids namely histamines, serotonin, prostaglandins, kinins, interleukins, substance P, neuropeptides and NFkβ.
MPL 201T.6	To interpret the concepts of chronopharmacology, histamines, 5 HT antagonists circadian rhythm and its applications.

Course Name: PRINCIPLES OF DRUG DISCOVERY (Theory)
Course Code: MPL 203T, I M.PHARM, Second Semester.

MPL 203T.1	To give a clear concepts over drug target identification, validation and drug discovery. Stressing point on lead Optimization and Economics of drug discovery
MPL 203T.2	To impart knowledge on Genomics, bioinformatics, zinc finger proteins, siRNAs and antisense oligonucleotides. Indeed explanation on role of transgenic animals in target validation, combinatorial chemistry & high throughput screening in silico lead discovery techniques
MPL 203T.3	To give clarity on Traditional and rational drug design. Methods followed in it and High throughput screening,
MPL 203T.4	To elaborate the concepts of different docking like rigid, flexible and manual, Quantitative analysis of structure activity relationship
MPL 203T.5	To provide more information on prodrugs, drug solubility, absorption, distribution and specific drug delivery
MPL 203T.6	To emphasize the concept of prodrug design, sustained drug action and practical consideration of prodrug design

Course Name: PHARMACOLOGY PRACTICAL III (Practical)Course Code: MPL 205P, I M.PHARM, Second Semester.

MPL 205P.1	To record the rat BP, ECG, heart rate
MPL 205P.2	To study drug absorption by averted rat ileum preparation and toxicity studies for acute oral, dermal as per OECD guidelines.
MPL 205P.3	To analyze Serum biochemical, hematological, urine and histological parameters. And study the Protocol design for clinical trials.
MPL 205P.4	To record the DRC of agonist, antagonist/potentiating DRC of agonist using suitable isolated tissue preparations.
MPL 205P.5	To determine the strength of unknown sample by interpolation, matching, bracketing and multiple point bioassays, using suitable isolated tissue preparations.
MPL 205P.6	To estimate PA2 values of various antagonists using suitable isolated tissue preparations and study the effects of various drugs on isolated heart preparations

Course Name: Research Methodology and Biostatistics (Theory)Course Code: MRM 301 T, II M Pharmacy, Third Semester.

MRM 301T.1	Identify the concepts of medical research and values in medical ethics. Define the CPCSEA guidelines for laboratory animal facility.
MRM 301T.2	Understand Basic statistical methods which are used in collecting data study and analyze. Observe Errors relating experimentation
MRM 301T.3	Know testing of the hypothesis and understand how far population parameter significant based on estimator with the help of parametric tests. Non parametric tests can also observed.
MRM 301T.4	Know application of Analysis in field or lab experimental to design and factorial experiments. Apply the knowledge in research objects about reliability and validity experimental study.

Course Name: Journal Club
Course Code: MPL 302, II M Pharmacy, Third Semester.

MPL 302.1	Critically appraise the research article of their specialization published in reputed journals. Students are trained for inquiry based learning and critical thinking skills.
MPL 302.2	Access journals by adopting search engines and made to collect relevant data, analyze and comment on the findings with the submission of the document evidence and present on the same for assessment

Course Name: Project Work
Course Code: MPA 402 & 403, II M Pharmacy, Fourth Semester.

MPL 402.1	Prepare the presentation based on the results obtained in the research work.
MPL 402.2	Explain outcome of their project along with further scope for research. This develops their oratory and leadership skills.

PROGRAMME: M. PHARMACY- PHARMACEUTICS (COURSE OUTCOMES)

Course Name: Modern Pharmaceutical Analytical Techniques (Theory)Course Code: MPH 101 T, I M Pharmacy, First Semester.

MPH 101 T.1	Understand the UV-Visible spectroscopy, IR, flame and atomic absorption spectroscopy.
MPH 101 T.2	Know principles of NMR spectroscopy, instrumentation and applications.
MPH 101 T.3	Understand the principles of mass spectroscopy, different ionization techniques and applications of mass spectroscopy.
MPH 101 T.4	Know the principles and procedures of paper and capillary electrophoresis; XRD and its applications.
MPH 101 T.5	Understand the principles and procedures of immunoassays like radioimmunoassay, ELISA and bioluminescent assays.

Course Name: Advanced Biopharmaceutics & Pharmacokinetics (Theory)Course Code: MPH 102 T, I M Pharmacy, First Semester.

MPH 102 T.1	The basic concepts in biopharmaceutics and pharmacokinetics.
MPH 102 T.2	The use of raw data and derive the pharmacokinetic models and parameters that describe the process of drug absorption, distribution, metabolism and excretion.
MPH 102 T.3	To critically evaluate biopharmaceutics studies involving drug product equivalency.
MPH 102 T.4	To design and evaluate dosage regimens of the drugs using pharmacokinetic parameters.
MPH 102 T.5	The potential clinical pharmacokinetic problems and application of basics of pharmacokinetics.

Course Name: Modern Pharmaceutics (Theory) Course Code: MPH 103 T, I M Pharmacy, First Semester.

MPH 103 T.1	Learn about the science behind performing a Preformulation study before formulating a novel drug delivery system.
MPH 103 T.2	Understand the current good manufacturing practices that are implemented in various pharmaceutical industries.
MPH 103 T.3	Understand various validation protocols that are been followed in the pharmaceutical industries as per various regulatory guidelines.
MPH 103 T.4	Understand various optimization techniques that are used in prior to formulate any new dosage form. Understand how to run the optimization softwares (For ex: Design expert and Minitab).
MPH 103 T.5	Understand about the science between compaction and compression of a tablet.Understand about various dissolution parameters that have to be incorporated while performing dissolution studies.

Course Name: Regulatory Affairs (Theory) Course Code: MPH 104T, I M Pharmacy, First Semester.

MP H 104 T.1	Comprehend regulations pertaining to drugs.
MP H 104 T.2	Describe the regulatory guidance and guidelines for filing and approval process.
MP H 104 T.3	Detail the preparation of dossiers and their submission to regulatory agencies in different countries.
MP H 104 T.4	Express the submission of global documents in CTD/eCTD formats.
MP H 104 T.5	Define the clinical trials for approvals for conducting clinical trials.

Course Name: Pharmaceutics – I (Practical) Course Code: MPH 105 P, I M Pharmacy, First Semester.

MPH 105P.1	Know Variability and Operation of commonly used analytical instruments like UV Vis spectrophotometer, HPLC, Gas Chromatography, Fluorimetry and Flame photometry.
MPH 105P.2	Have knowledge as well as hands on training with respect to the principles of formulation science such as Preformulation studies and Micromeritics
MPH 105P.3	Possess the knowledge about effect of compressional force on tablets Properties.

Course Name: Pharmaceutics – II (Practical) Course Code: MPH 106 P, I M Pharmacy, First Semester.

MPH 106P.1	Understand the role of Biopharmaceutics in bioavailability and calculation of pharmacokinetic parameters
MPH 106P.2	Improvement of dissolution studies on poorly soluble drugs
MPH 106P.2	Formulate and evaluate various novel drug delivery systems: Floating DDS, Muco adhesive tablets and Trans dermal patches

Course Name: Molecular Pharmaceutics (Nano Technology & Targeted DDS) (Theory)

Course Code: MPH 201 T, I M Pharmacy, Second Semester.

MPH 201 T.1	The concepts of nanotechnology-based drug delivery systems and targeted drug delivery systems
MPH 201 T.2	The criteria for selection of drugs and excipients for the development of nano pharmaceuticals and targeted drug delivery systems
MPH 201 T.3	Various approaches/ methods for the development of such formulations.
MPH 201 T.4	Evaluation tests for nano pharmaceuticals and targeted drug delivery systems

Course Name: Drug Delivery Systems (Theory) Course Code: MPH 202 T, I M Pharmacy, Second Semester.

MPH 202 T.1	The basic concepts of modified release drug delivery systems.
MPH 202 T.2	The criteria for selection of drugs and excipients.
MPH 202 T.3	Various approaches/methods for the development of novel drug delivery systems.
MPH 202 T.4	The evaluation tests for the novel drug delivery systems.

Course Name: Computer Aided Drug Delivery System (Theory)Course Code:
MPH 203 T, I M Pharmacy, Second Semester.

MPH 203 T.1	Explain about the role of computers in pharmaceutical research, various modeling approaches and parameters used in modeling.
MPH 203 T.2	Understand about basics and guidelines of Quality by Design (QbD). Understand about computation modeling techniques of ADME process for a drug.
MPH 203 T.3	Understand about the concept of optimization and they can design a formulation of emulsion a micro emulsion using software's like design expert.
MPH 203 T.4	Understand about using of computer aided designs in in-vitro dissolution studies. Understand the regulations involved in clinical data collection and management.

Course Name: Formulation Development of Pharmaceutical and Cosmetic Products (Theory)
Course Code: MPH 204 T, I M Pharmacy, Second Semester.

MPH 204 T.1	Learn about the science behind performing a Preformulation study before formulating a novel drug delivery system. Learn about various pre-formulation parameters that have to be studied before formulating a novel drug delivery system.
MPH 204 T.2	Learn about the importance of solubility for a drug and methods to enhance the solubility.
MPH 204 T.3	Learn about basics of drug dissolution and various parameters involved in in vitro drug dissolution studies.
MPH 204 T.4	Understand about basics and legal aspects of cosmeticology and various formulations like dentifrices, lipsticks, nail polish and baby products etc.

Course Name: Pharmaceutics – III (Practical) Course Code: MPH 205 P, I M Pharmacy, Second Semester.

MPH 205P.1	Know the effect of temperature, nonsolvent, incompatible polymer addition on preparation of microcapsules.
MPH 205P.2	Design and perform in-vitro evaluation studies for various novel drug delivery systems: Alginate beads, gelatin /albumin microspheres, liposomes / niosomes and spherules.
MPH 205P.3	Perform in-vitro dissolution of marketed products and interpretation of dissolution data.

Course Name: Research Methodology and Biostatistics (Theory)Course Code: MRM 301 T, II M Pharmacy, Third Semester.

MRM 301T.1	Identify the concepts of medical research and values in medical ethics. Define the CPCSEA guidelines for laboratory animal facility.
MRM 301T.2	Understand Basic statistical methods which are used in collecting data study and analyze. Observe Errors relating experimentation
MRM 301T.3	Know testing of the hypothesis and understand how far population parameter significant based on estimator with the help of parametric tests. Non parametric tests can also observed.
MRM 301T.4	Know application of Analysis in field or lab experimental to design and factorial experiments. Apply the knowledge in research objects about reliability and validity experimental study.

Course Name: Journal Club
Course Code: MPH 302, II M Pharmacy, Third Semester.

MPH 302.1	Critically appraise the research article of their specialization published in reputed journals. Students are trained for inquiry based learning and critical thinking skills.
MPH 302.2	Access journals by adopting search engines and made to collect relevant data, analyze and comment on the findings with the submission of the document evidence and present on the same for assessment

Course Name: Project Work
Course Code: MPH 402 & 403, II M Pharmacy, Fourth Semester.

MPH 402.1	Prepare the presentation based on the results obtained in the research work.
MPH 402.2	Explain outcome of their project along with further scope for research. This develops their oratory and leadership skills.

PROGRAMME: M. PHARMACY- PHARMACEUTICAL ANALYSIS(COURSE OUTCOMES)

Course Name: Modern Pharmaceutical Analytical Techniques (Theory)Course Code: MPA 101 T, I M Pharmacy, First Semester.

MPA 101 T.1	To understand the basic knowledge on assay of single and multiple component pharmaceuticals by using various analytical instruments
MPA 101 T.2	Skills in selecting the suitable techniques for analysis of drugs and pharmaceuticals
MPA 101 T.3	To expand the theoretical knowledge on various instrumental techniques including microscopic methods available for analysis of organic substances
MPA 101 T.4	To apply the knowledge learnt in developing new procedures of their own design
MPA 101 T.5	Comparing various methods of analysis and their outcomes

Course Name: Advanced Pharmaceutical Analysis (Theory)Course Code: MPA 102 T, I M Pharmacy, First Semester.

MPA 102 T.1	The student Will understand the concepts of Impurity profiling
MPA 102 T.2	The students will gain appropriate knowledge about stability testing of bulk and various formulations.
MPA 102 T.3	Subject supply enough idea on the biological tests
MPA 102 T.4	It supports to understand the immunoassays.
MPA 102 T.5	The students learn the regulatory guidelines and their applications.

Course Name: Pharmaceutical Validation (Theory) Course Code: MPA 103 T, I M Pharmacy, First Semester.

MPA 103 T.1	The student learns on the importance of patent and intellectual property rights.
MPA 103 T.2	The students are trained on the qualification aspects of instruments.
MPA 103 T.3	The importance of calibration to be performed for the instruments.
MPA 103 T.4	The various validation aspects to be carried out in the industry.
MPA 103 T.5	The students gain knowledge on how validation are carried for various components. Such as instrument validation, cleaning validation and process validation.

Course Name: Food Analysis (Theory)
Course Code: MPA 104T, I M Pharmacy, First Semester.

MPA 104 T.1	Student shall be able to understand various determination methods for Food constituents
MPA 104 T.2	Student shall be able to understand various determination methods for Food additives.
MPA 104 T.3	Student shall be able to understand the determination procedures of Finished food products
MPA 104 T.4	Student shall be able to understand various analytical techniques in the determination of Pesticides in food
MPA 104 T.5	Student shall be able to understand various analytical techniques in the determination of knowledge on food regulations

Course Name: Pharmaceutical Analysis – I (Practical) Course Code: MPA 105 P, I M Pharmacy, First Semester.

MPA 105P.1	Calibration of UV-Visible spectrophotometer and FTIR spectrophotometer, Calibration of GC and HPLC.
MPA 105P.2	Assay of official compounds by different titrations and instrumental techniques
MPA 105P.3	Quantitative determination of hydroxyl group and amino group, and Colorimetric determination of drugs by using different reagents

Course Name: Pharmaceutical Analysis – II (Practical) Course Code: MPA 106 P, I M Pharmacy, First Semester.

MPA 106P.1	Learn about the determination of total reducing sugar, proteins, vitamins content in foods
MPA 106P.2	Understand the selection of analytical methods for analysis of synthetic colors in food products
MPA 106P.2	Understand the selection of various analytical methods for determining food additives

Course Name: Advanced Instrumental Analysis (Theory) Course Code: MPA 201 T, I M Pharmacy, Second Semester.

MPA 201 T.1	The detailed interpretation pattern for the organic substances
MPA 201 T.2	Practical aspects and troubleshooting techniques for HPLC and GC techniques for Bio-chromatographic analysis.
MPA 201 T.3	Knowledge and skills in advanced instrumentation techniques for drug analysis
MPA 201 T.4	Theoretical aspects of hyphenated analytical techniques
MPA 201 T.5	Critical analysis of analytical problem and selection of appropriate analytical tool for the quantification of chemicals and excipients

Course Name: Modern Bio-Analytical Techniques (Theory)Course Code: MPA 202 T, I M Pharmacy, Second Semester.

MPA 202 T.1	It upgrade the method to conduct bio-equivalence study for formulations by utilising the proper regulatory guidelines
MPA 202 T.2	Get the knowledge on extraction procedures
MPA 202 T.3	Pupil will be exposed to both theoretical and practical knowledge on dissolution and release studies.
MPA 202 T.4	The subject content presents better understanding on metabolite identification process.
MPA 202 T.5	The class learns the drug product performance through bioavailability studies.

Course Name: Quality Control and Quality Assurance (Theory)Course Code: MPA 203 T, I M Pharmacy, Second Semester.

MPA 203 T.1	Student shall be able to understand the importance of cGMP aspects of documentation
MPA 203 T.2	Student shall be able to understand the importance of analysis of packing materials
MPA 203 T.3	Student shall be able to understand the responsibilities of QA department
MPA 203 T.4	Student shall be able to understand the manufacturing operations and control.
MPA 203 T.5	Student shall be able to understand GLP and regulatory Affairs

Course Name: Herbal and Cosmetic Analysis (Theory) Course Code: MPA 204 T, I M Pharmacy, Second Semester.

MPA 204 T.1	Student shall be able to understand various herbal regulations
MPA 204 T.2	Student shall be able to understand various analytical techniques in the determination of herbal products
MPA 204 T.3	Student shall be able to understand the herbal monographs
MPA 204 T.4	Student shall be able to understand various herbal drug interactions
MPA 204 T.5	Student shall be able to understand various performance evaluation of cosmetic products

Course Name: Pharmaceutical Analysis – III (Practical) Course Code: MPA 205 P, I M Pharmacy, Second Semester.

MPA 205P.1	Know comparison of absorption spectra by UV and Wood ward – Fiesure rule and Interpretation of organic compounds by FT-IR
MPA 205P.2	Know protocol preparation and performance of analytical / bioanalytical method validation, and protocol preparation for the conduct of BA/BE studies according to guidelines.
MPA 205P.3	Understand determination of purity by DSC in pharmaceuticals and Identification of organic compounds using FT-IR, NMR, CNMR andMass spectra

Course Name: Research Methodology and Biostatistics (Theory)Course Code: MRM 301 T, II M Pharmacy, Third Semester.

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SIR C.R.REDDY COLLEGE OF PHARMACEUTICAL SCIENCES
(An ISO 9001 : 2015 Certified Instituiton)
(Affiliated to Andhra University, Visakhapatnam; Recognized by Dept.of Technical Education, Govt.of A.P)
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M PHARM PROGRAM OUTCOMES

M.PHARM (PHARMACEUTICAL ANALYSIS)

PO1: To deal with various advanced instrumental techniques for separation, characterization, and quantification of drugs in bulk, formulation & biological

PO2: To know the science of detection of impurities, stability of the product and guidelines.

PO3: To impart knowledge on analysis of food constituents and finished food products, additives, the pesticides and the regulations of food and legislations of food

PO4: To understand validation and its application in industry, their methodologies application in manufacturing

PO5: To know about quality assurance aspects of pharmaceutical industries such as CGMP, Documentations, certifications, GLP, and other regulatory

PO6: To create a talent pool by involving students in research projects and to make Undertake research projects under faculty guidance

M.PHARM (PHARMACOLOGY)

PO 1: Acquire a strong knowledge in theoretical & Practical aspects of Pharmacology subjects along with necessary skills.

PO 2: Gain Knowledge on modern Pharmacological tools and software's associated with Research and development.

PO 3: Must be able to compete in the modern Pharmacological domains of the industry like Pharmacovigilance, Regulatory affairs and new drug developments.

PO 4: Able to apply knowledge on new natural, synthetic and semi synthetic drug developments and must be able to provide most modern data acquisition and analysis system in the biological and Pharmacological research.

PO 5: Demonstrate High throughput screening mechanism in new drug discovery and development of challenging and expensive activities of the Pharmaceutical Industry.

PO 6: Succeed in pharmaceutical industry or academics through innovative teaching methodologies that stimulates students to self-learning and extend their knowledge.

M.PHARM (PHARMACEUTICS & PHARM ACEUTICAL TECHNOLOGY)

PO 1: Impart knowledge on the novel drug delivery systems, approaches, criteria for the selection of polymers and drugs and their formulation and evaluation.

PO2: To know various preformulating elements, industrial management and GMP considerations, Pilot Plant Scale up Techniques, Stability testing, sterilization and packaging of dosage forms.

PO3: To impart knowledge and skills for dose calculations, dose adjustments and apply biopharmaceutics theories in practical problem-solving. The pharmacokinetic models, bioequivalence and potential clinical pharmacokinetic problem analysis

PO4: Skill development in Pharmaceutical research, Pharmacoinformatic, in drug development in Computational modelling, Preclinical development, clinical development, Artificial Intelligence and Robotics, and Computational fluid dynamics.

PO5: To impart knowledge and skills necessary for cosmetics and cosmeceuticals, their safety and efficacy and current technologies in cosmetic industry.

PO 6: To create a talent pool by involving students in research projects and to make students undertake research projects under faculty guidance for publication.

PO7: To foster ambitious desire among students to undertake higher studies and career growth.

PO 8: Apply knowledge to create newer technology and skills in pharmaceutical technology development and research.