THE DALE VIEW COLLEGE OF PHARMACY AND RESEARCH CENTRE

PUNALAL

COURSE OUTCOMES- B PHARM

Course Name: Human Anatomy and Physiology - I (Theory) **Course code:** BP101T **Year of Study: I/IV B.PHARMACY 1st SEMESTER**	
C1O1. 1	Explain the gross morphology, structure and functions of various organs of the human body.
C1O1.2	Describe the various homeostatic mechanisms and their imbalances
C1O1.3	Identify the various tissues and organs of different systems of human body
C1O1. 4	IIustrate the various experiments related to special senses and nervous system
C1O1.5	Evaluate the coordinated working pattern of different organs of each system
Course Name: Pharmaceutical Analysis – I (Theory) **Course code:** BP102T **Year of Study:** 1st B. Pharmacy 1st Semester	
C102.1	Demonstrate the principles of volumetric and electro chemical analysis
C102.2	Interpret various volumetric and electrochemical titrations
C102.3	Develop analytical skills
Course Name: Pharmaceutics – I (Theory) **Course code:** BP103T **Year of Study:** 1st B. Pharmacy 1st Semester	
C103.1	Discover the history of profession of pharmacy
C103.2	Recognize the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations
C103.3	Discuss the professional way of handling the prescription
C103.4	Preparation of various conventional dosage forms

Course Name : Pharmaceutical Inorganic chemistry (Theory)
Course code : BP104T
Year of Study: 1st B. Pharmacy 1st Semester

C104.1	Classify the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals
C104.2	Recognize the medicinal and pharmaceutical importance of inorganic compounds

Course Name: Communication skills (Theory)
Course code: BP105T
Year of Study: 1st B. Pharmacy 1st Semester

C105.1	IIustrate thebehavioralneeds for a Pharmacist to function effectively in the areas of pharmaceutical operation
C105.2	Translate effectively (Verbal and Nonverbal)
C105.3	Assemble manage the team as a team player
C105.4	Develop interview skills
C105.5	Develop leadership qualities and essentials

Course Name: Remedial Biology (Theory)
Course code: BP106 RBT
Year of Study: 1st B. Pharmacy 1st Semester

C106.1	Indicate the classification and salient features of five kingdoms of life
C106.2	Identify the basic components of anatomy & physiology of plant
C106.3	Recognize and understand the basic components of anatomy & physiology animal with special reference to human

Course Name: Remedial Mathematics (Theory)
Course code : BP106 RMT
Year of Study: 1st B. Pharmacy 1st Semester

C106.1	Interpret the theory and their application in Pharmacy
C106.2	Solve the different types of problems by applying theory
C106.3	Reproduce the important application of mathematics in Pharmacy

Course Name : Human Anatomy and Physiology - I (Practical)
Course code : BP107P
Year of Study:1st B.Pharmacy 1st Semester

C107.1	Recall handling of compound microscope and to memorize various animal

	tissues.
C107.2	Summarize the characteristics of different bones (skeletal system).
C107.3	Identify the bleeding/clotting time and blood group.
C107.4	Analyze the blood cells using hemocytometry
C107.5	Predict the erythrocyte sedimentation rate of human blood andheart rate/ pulse rate
Course Name : Pharmaceutical Analysis – I (Practical) **Course code :** BP108P **Year of Study :** 1st B.Pharmacy 1st Semester	
C108.1	Articulate the importance of calibration, calibration of weights, pipette and burette
C108.2	Demonstrate standardization of solutions with different strengths
C108.3	Experiment with volumetric analysis such as acidimetry and alkalimetry, oxidation and reduction reactions, iodometry, complexometry, precipitation and non-aqueous titration
C108.4	Analyze pharmaceuticals by electro-analytical methods
Course Name : Pharmaceutics – I (Practical) **Course code :** BP 109 P **Year of Study :** 1st B.Pharmacy 1st Semester	
C109.1	Recall the principles used in the preparation of solid, liquid and semi solid dosage forms
C109.2	Experiment with monophasic ,biphasic liquid dosage forms for internal and external administration
C109.3	Design powders and granules.
C109.4	Formulate suppositories.
Course Name : Pharmaceutical inorganic chemistry (Practical) **Course code :** BP110P **Year of Study :** 1st B.Pharmacy 1st Semester	
C110.1	Recall the sources of limit tests, preparation and identification of Compounds
C110.2	Apply knowledge to perform modified limit tests
C110.3	Assess quality of inorganic pharmaceuticals
C110.4	Select suitable method for the preparation of inorganic Pharmaceuticals

Course Name : Communication Skills (Practical)
Course code : BP111P
Year of Study : 1st B.Pharmacy 1st Semester

C111.1	Apply the practical skills for effective communication (Verbal and Non verbal).
C111.2	Distinguish pronunciation of vowel and consonant sounds
C111.3	Take Apart in advanced learning on comprehension/direct and indirect speech
C111.4	Develop the interview handling skills.

Course Name : Remedial Biology (Practical)
Course code : BP112RBP
Year of Study : 1st B.Pharmacy 1st Semester

C112.1	Convince the handling of microscope and permanent slide preparation techniques
C112.2	Explain the structure of cell and its inclusions
C112.3	Identify various plant parts, and to organize their modifications
C112.4	Categorize the physiology of frog by using computer models
C112.5	Assess the microscopical study and identification of tissues pertinent to stem, root, leaf, seed, fruit and flower
C112.6	Compile the bones identification, blood group, blood pressure and tidal volume determination

I/IV B.PHARMACY 2nd SEMESTER
Course Name: Human Anatomy and Physiology – II (Theory)
Course code: BP201T
Year of Study: 1st B.Pharmacy 2nd Semester

C201.1	Explain the gross morphology, structure and functions of various organs of the human body
C201.2	Describe the various homeostatic mechanisms and their imbalances
C201.3	Identify the various tissues and organs of different systems of human body
C201.4	Enumerate the hematological tests like blood cell counts, hemoglobin estimation, bleeding/ clotting time etc. and also record blood pressure, heart rate, pulse and respiratory volume
C201.5	Establish coordinated working pattern of different organs of each system
C201.6	Analyze the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body

Course Name : Pharmaceutical organic chemistry – I (Theory)
Course code : BP202T
Year of Study : 1st B.Pharmacy 2nd Semester

C202.1	Sketch the structure, name and the type of isomerism of the organic compound
C202.2	Evaluate the reaction, name the reaction and orientation of reactions
C202.3	Interpret the reactivity/stability of compounds
C202.4	Identify/confirm the identification of organic compound

Course Name : Biochemistry (Theory)
Course code : BP203T
Year of Study : 1st B.Pharmacy 2nd Semester

C203.1	Function the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes.
C203.2	Discuss the metabolism of nutrient molecules in physiological and pathological conditions
C203.3	Compute the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.

Course Name: Pathophysiology (Theory)
Course code: BP204T
Year of Study:1st B.Pharmacy 2nd Semester

C204.1	Describe the etiology and pathogenesis of the selected disease states
C204.2	Name the signs and symptoms of the diseases
C204.3	Practice the complications of the diseases

Course Name : Computer applications in pharmacy (Theory)
Course code : BP205T
Year of Study :1st B.Pharmacy 2nd Semester

C205.1	Predict various types of application of computers in pharmacy
C205.2	Categorise the various types of databases
C205.3	Apply the various applications of databases in pharmacy

Course Name : Environmental studies (Theory)
Course code : BP206T
Year of Study : 1st B.Pharmacy 2nd Semester

C206.1	Demonstrate the awareness about environmental problems among learners
C206.2	Articulate basic knowledge about the environment and its allied problems
C206.3	Enumerate an attitude of concern for the environment
C206.4	Manage to participate in environment protection and environment improvement
C206.5	Develop the skills to help the concerned individuals in identifying and solving environmental problems
C206.6	Plan to attain harmony with Nature

Course Name : Human anatomy and physiology – II (Practical)
Course code : BP207P
Year of Study : 1st B.Pharmacy 2nd Semester

C207.1	Recall the physiology of special senses with the help of models, charts and specimens
C207.2	Develop the knowledge on coordinating working of organs of various systems with the help of models, charts and specimens
C207.3	Analyze the functions of cranial nerves by various sensory and motor functions
C207.4	Evaluate body temperature and body mass index
C207.5	Determine tidal volume and vital capacity
C207.6	Assess the knowledge on family planning devices, pregnancy diagnostic tests, tissues of vital organs and gonads

Course Name : Pharmaceutical organic chemistry – I (Practical)
Course code : BP208
Year of Study : 1st B.Pharmacy 2nd Semester

C208.1	Explain the qualitative analysis and preparation of pharmaceutical organic compounds
C208.2	Evaluate the presence of several functional groups in pharmaceutical compounds
C208.3	Determine unknown pharmaceutical organic compounds by determining their melting point/boiling point
C208.4	Prepare and characterize the derivatives of organic compounds

Course Name : Biochemistry (Practical)
Course code : BP209P
Year of Study :1st B.Pharmacy 2nd Semester

C209.1	Remember the qualitative analysis of carbohydrates and proteins
C209.2	Estimate the amount of reducing sugars by DNSA method
C209.3	Determine the effect of temperature and substrate concentration on salivary amylase activity
C209.4	Elaborate the clinical significance of creatinine, proteins and cholesterol in blood

Course Name : Computer applications in pharmacy (Practical)
Course code : BP210P
Year of Study :1st B.Pharmacy 2nd Semester

C210.1	Demonstrate and make use of MS Office, MS Word, MS Excel, MSAccess and MS Power point.
C210.2	Understand the paradigms of program languages and be exposed to at least one language from each model, C and SQL.
C210.3	Summarize the report and printing the report from patient Database
C210.4	Design a questionnaire using a word processing package to gather information about a particular disease
C210.5	Create HTML web page to show personal information
C210.6	Create mailing labels Using Label Wizard , generating label in MSWORD

I/IV B.PHARMACY 3rd SEMESTER

Course Name: Pharmaceutical organic chemistry – II (Theory)
Course code: BP301T
Year of Study: 2nd B.Pharmacy 3rd Semester

C301.1	Write the structure, name and the type of isomerism of the organic compound
C301.2	Write the reaction, name the reaction and orientation of reactions

C301.3	Describe the reactivity/stability of compounds
C301.4	Prepare organic compounds
Course Name : Physical Pharmaceutics – I (Theory) **Course code :** BP302T **Year of Study :** 2nd B.Pharmacy 3rd Semester	
C302.1	Demonstrate use of physicochemical properties in evaluation of dosage forms.
C302.2	Establish physicochemical properties of drug molecules in formulation research and development
Course Name: Pharmaceutical Microbiology (Theory) **Course code:** BP303T **Year of Study:** 2nd B.Pharmacy 3rd Semester	
C303.1	Understand methods of identification, cultivation and preservation of various microorganisms
C303.2	Importance of sterilization in microbiology and pharmaceutical industry
C303.3	Predict sterility testing of pharmaceutical products
C303.4	Analyse Microbiological standardization of Pharmaceuticals.
C303.5	Understand the cell culture technology and its applications in pharmaceutical industries

Course Name : Pharmaceutical Engineering (Theory) **Course code :** BP304T **Year of Study :** 2nd B.Pharmacy 3rd Semester

C304.1	Demonstrate various unit operations used in Pharmaceutical industries
C304.2	Categorize the material handling techniques
C304.3	Evaluate various processes involved in pharmaceutical manufacturing process
C304.4	Determine various tests to prevent environmental pollution.
C304.5	Compile and comprehend significance of plant lay out design for optimum use of resources
C304.6	Classify the various preventive methods used for corrosion control in Pharmaceutical industries
Course Name : Pharmaceutical organic chemistry – II (Practical) **Course code :** BP305P **Year of Study :** 2nd B.Pharmacy 3rd Semester	
C305.1	Develop the knowledge on different recrystalization and steam distillation techniques
C305.2	Identify the purity of fats and oils by acid value, saponification value and iodine value
Course Name : Physical Pharmaceutics – I (Practical) **Course code :** BP306P **Year of Study:** 2nd B.Pharmacy 3rd Semester	
C306.1	Importance of the significance of physical properties such as solubility, surface tension, partition coefficient and pK_a in the design of dosage forms
C306.2	Apply Henderson – Hasselbalch equation for interpretation of pK_a value of drugs.
C306.3	Determine the surface tension of sample liquids by drop count and drop weight methods

C306.4	Estimate the stability constants of complexes by solubility and pH titration methods.
Course Name : Pharmaceutical Microbiology (Practical) **Course code :** BP307P **Year of Study:** 2nd B.Pharmacy 3rd Semester	
C307.1	Recall different techniques of sterilization
C307.2	Demonstrate various staining methods – simple, gram staining and acid fast staining
C307.3	Interpret the results of microbial testing.
C307.4	Test for possible microbial contaminants
C307.5	Estimate the amount of biomass in the given sample.
C307.6	Choose the correct method to evaluate the microbes to be tested.
Course Name: Pharmaceutical Engineering (Practical) **Course code:** BP308P **Year of Study:** 2nd B.Pharmacy 3rd Semester	
C308.1	Determine the Particle size by beaker decantation method
C308.2	Construct drying curves (for calcium carbonate and starch).
C308.3	Determine the humidity of air −From wet and dries bulb temperatures (use of Dew point method).
C308.4	Describe of Construction, working and application of Pharmaceutical Machinery such as rotary tablet machine, fluidized bed coater, fluid energy mill, de humidifier.

II/IV B.PHARMACY 4th SEMESTER

Course Name : Pharmaceutical organic chemistry – III (Theory)
Course code : BP401T
Year of Study : 2nd B.Pharmacy 4th Semester

C401.1	Understand the methods of preparation and properties of organic compounds
C401.2	Explain the stereo chemical aspects of organic compounds and stereo chemical reaction
C401.3	Express the medicinal uses and other applications of organic compounds

Course Name : Medicinal Chemistry – I (Theory)
Course code : BP402T
Year of Study : 2nd B.Pharmacy 4th Semester

C402.1	Understand the chemistry of drugs with respect to their pharmacological activity
C402.2	Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
C402.3	Identify the Structural Activity Relationship (SAR) of different class of drugs
C402.4	Write the chemical synthesis of some drugs

Course Name : Physical Pharmaceutics – II (Theory)
Course code : BP403T
Year of Study : 2nd B.Pharmacy 4th Semester

C403.1	Understand various physicochemical properties of drug molecules in the designing the dosage form
C403.2	Correlate the principles of chemical kinetics & to use them in assigning

	expiry date for Formulation
C403.3	Demonstrate use of physicochemical properties in evaluation of dosage forms
C403.4	Evaluate physicochemical properties of drug molecules in formulation research and Development
Course Name : Pharmacology – I (Theory) **Course code :** BP404T **Year of Study :** 2nd B.Pharmacy 4th Semester	
C404.1	Understand the pharmacological actions of different categories of drugs
C404.2	Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.
C404.3	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases
C404.4	Observe the effect of drugs on animals by simulated experiments
C404.5	Compare correlation of pharmacology with other bio medical sciences
Course Name : Pharmacognosy and Phytochemistry – I (Theory) **Course code :** BP405T **Year of Study :** 2nd B.Pharmacy 4th Semester	
C405.1	Express the techniques in the cultivation and production of crude drugs
C405.2	Explain the crude drugs, their uses and chemical nature
C405.3	Illustrate evaluation techniques for the herbal drugs
C405.4	Demonstrate the microscopic and morphological evaluation of crudedrugs

Course Name: Medicinal chemistry – I (Practical)
Course code: BP406P
Year of Study: 2nd B.Pharmacy 4th Semester

C406.1	Explain the techniques involved in isolation and purification of drugs and intermediates
C406.2	Recall the basic requirements for synthesis and assay of drugs
C406.3	Determine the Partition coefficientof drugs

Course Name : Physical Pharmaceutics – II (Practical)**;**
Course code : BP407P
Year of Study :2nd B.Pharmacy 4th Semester

C407.1	Determine of surface tension of given liquids by drop count and drop weight method
C407.2	Determine of viscosity of liquid using Ostwald's viscometer
C407.3	Determine sedimentation volume with effect of different concentration of single suspending agent
C407.4	Distinguish the rate constants as per the chemical reaction.
C407.5	Interpret the shelf life of a given formulation by accelerated stability studies

Course Name : Pharmacology – I (Practical)
Course code: BP408P
Year of Study: 2nd B.Pharmacy 4th Semester

C408.1	Generalize basic instruments, common laboratory animals used in experimental pharmacology and to organize animal house as per the CPCSEA guidelines
C408.2	Demonstrate the common laboratory techniques like routes of administration blood withdrawal, anesthetics and euthanasia used for animal studies
C408.3	Analyse the effect of drugs acting as enzyme inducers, skeletal muscle relaxants and affecting locomotor activity in laboratory animals
C408.4	Predict various screening models for anticonvulsant and anxiolytic activity

Course Name : Pharmacognosy and Phytochemistry–I (Practical) **Course code :** BP409P **Year of Study :**2nd B.Pharmacy 4th Semester	
C409.1	Analyse of crude drugs by chemical tests
C409.2	Remember different morphological and microscopical characteristic features of crude drugs
C409.3	Evaluate the crude drugs by physico chemical methods of evaluation.
C409.4	Evaluate the crude drugs by quantitative evaluation methods.
III/IV B.PHARMACY 5th SEMESTER **Course Name :** Medical Chemistry-II (Theory) **Course Code :** BP501T **Year of study :** 3rd B.Pharmacy 5th Semester	
C501.1	Describe the chemistry of drugs with respect to their pharmacological activity
C501.2	Explain the drug metabolic pathways, adverse effect and therapeutic value of drugs
C501.3	Know the Structure Activity Relationship of different class of drugs
C501.4	Classify the selected drugs based on their chemical synthesis
Course Name : Formulate Pharmacy-I (Theory) **Course Code :** BP502T **Year of study :** 3rd B.Pharmacy 5th Semester	
C502.1	Describe the various pharmaceutical dosage forms and their manufacturing techniques
C502.2	Determine various considerations in development of pharmaceutical dosage forms
C502.3	Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality
Course Name : Pharmacology-II (Theory) **Course Code :** BP503T **Year of study :** 3rd B.Pharmacy 5th Semester	
C503.1	Understand the mechanism of drug action and its relevance in the treatment of different diseases
C503.2	Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments

C503.3	Demonstrate the various receptor actions using isolated tissue preparation
C503.4	Explain the correlation of pharmacology with related medical sciences
Course Name : Pharmacognosy and Photochemistry-II (Theory) **Course Code :** BP504T **Year of study :** 3rd B.Pharmacy 5th Semester	
C504.1	Describe basic metabolic pathways and formation of different secondary metabolites
C504.2	Describe various medicinally important secondary metabolites
C504.3	Apply modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents
C504.4	Demonstrate isolation and identification of phytoconstituents
Course Name : Pharmaceutical Jurisprudence (Theory) **Course Code :** BP505T **Year of study :** 3rd B.Pharmacy 5th Semester	
C505.1	Describe the Pharmaceutical legislations and their implications in the development and marketing
C505.2	Explain Various Indian pharmaceutical Acts and Laws
C505.3	Explain the regulatory authorities and agencies governing the manufacture and sale ofpharmaceuticals
C505.4	Describe the code of ethics during the pharmaceutical practice
Course Name : FormulatePharmacy -I (Practical) **Course Code :** BP506P **Year of study :** 3rd B.Pharmacy 5th Semester	
C506.1	Interpret the preformulation studies on drugs.
C506.2	Explain the preparation, evaluation and coating of tablets.
C506.3	Illustrate the formulation and evaluation of capsules.
C506.4	Design parenteral and ophthalmic products
C506.5	Describe the preparation of creams
C506.6	Evaluate glass containers as per pharmacopeial specifications

Course Name : Pharmacology-II (Practical) **Course Code :** BP507P **Year of study :**3rd B.Pharmacy 5th Semester	
C507.1	Importance of physiological salt solutions and to identify the effect of various drugs on isolated frog heart, blood pressure and heart rate of dog
C507.2	Illustrate the diuretic activity of drugs in mice/rats
C507.3	Test for pyrogens (Rabbit method)
C507.4	Identify the dose response relationship, effect of drugs on DRC and to construct the drug concentrations by various bioassay methods using animal simulator software
Course Name : Pharmacognosy and Phytochemistry-II (Practical) **Course Code :** BP508P **Year of study :**3rd B.Pharmacy 5th Semester	
C508.1	Analyze and evaluate the powdered crude drug samples by morphology, histology and powder characteristics
C508.2	Determine the isolation & detection of active principles
C508.3	Predict the crude drug by performing chromatographic techniques
C508.4	Analyse crude drugs by chemical tests
III/IV B.PHARMACY 6th SEMESTER	
Course Name : Medicinal Chemistry – III (Theory) **Course Code :** BP601T **Year of study :**3rd B.Pharmacy 6th Semester	
C601.1	Importance of drug design and different techniques of drug design.
C601.2	Understand the chemistry of drugs with respect to their biological activity
C601.3	Know the metabolism, adverse effects and therapeutic value of drugs
C601.4	Know the importance of SAR of drugs
Course Name : Pharmacology-III (Theory) **Course Code :** BP602T **Year of study :**3rd B.Pharmacy 6th Semester	
C602.1	Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases
C602.2	Discuss the principles of toxicology and treatment of various poisonings
C602.3	Appraise correlation of pharmacology with related medicalsciences

Course Name : Herbal Drug Technology (Theory)
Course Code : BP603T
Year of study :3rd B.Pharmacy 6th Semester

C603.1	Understand raw material as source of herbal drugs from cultivation to herbal drug product
C603.2	Know the WHO and ICH guidelines for evaluation of herbal drugs
C603.3	Know the herbal cosmetics, natural sweeteners, nutraceuticals
C603.4	Appraise patenting of herbal drugs, GMP
C603.5	Understand the preparation and development of herbal formulation
C603.6	Understand the herbal drug interactions

Course Name : Biopharmaceutics and Pharmacokinetics (Theory)
Course Code : BP604T
Year of study : 3rd B.Pharmacy 6th Semester

C604.1	Understand the basic concepts in biopharmaceutics and pharmacokinetics
C604.2	Use plasma data and derive the pharmacokinetic parameters to describe the process of drug absorption, distribution, metabolism and elimination
C604.3	Evaluate biopharmaceutic studies involving drug product equivalency
C604.4	Design and evaluate dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters
C604.5	Discover the potential clinical pharmacokinetic problems and apply basic pharmacokinetic principles to solve them

Course Name : Pharmaceutical Biotechnology (Theory)
Course Code : BP605T
Year of study :3rd B.Pharmacy 6th Semester

C605.1	Understand1 the importance of Immobilized enzymes in Pharmaceutical Industries
C605.2	Discuss Genetic engineering applications in relation to production of pharmaceuticals
C605.3	Importance of Monoclonal antibodies in Industries
C605.4	Use of microorganisms in fermentation technology

Course Name : Quality Assurance (Theory)
Course Code : BP606T
Year of study :3rd B.Pharmacy 6th Semester

C606.1	Explain CGMP aspects in a pharmaceutical industry appreciate the importance of documentation
C606.2	Explain the scope of quality certifications applicable to pharmaceutical industries
C606.3	Compare the responsibilities of QA & QC departments

Course Name : Medicinal Chemistry-III (Practical)
Course Code : BP607P
Year of study :3rd B.Pharmacy 6th Semester

C607.1	Define and select the method for preparation of drugs and Intermediates
C607.2	Choose the method for assay of drugs by quantitative analysis
C607.3	Prepare medicinally important compounds or intermediates by Microwave irradiation technique
C607.4	Select the tools needed for drawing structures and reactions
C607.5	Predict the relation between physicochemical properties and biological activity

Course Name : Pharmacology-III (Practical)
Course Code : BP608P
Year of study:3rd B.Pharmacy 6th Semester

C608.1	Recall the dose calculations in pharmacological experiments, and torelate the antiallergic activity / anti-ulcer activity in rat models
C608.2	Construct serum biochemical parameters by using semi auto analyzer
C608.3	Evaluate acute oral toxicity (LD50), acute skin irritation / corrosion and acute eye irritation / corrosion of a test substance
C608.4	Predict the pharmacokinetic parameters and adapt the biostatistics methods in experimental pharmacology.
C608.5	Analyse pharmacological screening of drugs

Course Name : Herbal Drug Technology (Practical)
Course Code : BP609P
Year of study :3rd B.Pharmacy 6th Semester

C609.1	Remember different preliminary phytochemical screening of crude drugs
C609.2	Evaluate the various herbal formulations
C609.3	Apply monographic analysis of herbal drugs as per Pharmacopoeias
C609.4	Evaluate parameters such as aldehyde and phenol contents
C609.5	Assess the total alkaloid content

IV/IV B.PHARMACY 7th SEMESTER
Course Name : Instrumental Methods of Analysis (Theory)
Course Code : BP701T
Year of study :4th B.Pharmacy 7th Semester

C701.1	Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis
C701.2	Understand the chromatographic separation and analysis of drugs.
C701.3	Perform quantitative & qualitative analysis of drugs using various analytical instruments

Course Name : Industrial Pharmacy-II (Theory)
Course Code : BP702T
Year of study :4th B.Pharmacy 7th Semester

C702.1	Discuss the process of pilot plant and scale up of pharmaceutical dosage forms
C702.2	Understand the process of technology transfer from lab scale to commercial batch
C702.3	Express different laws and acts that regulate pharmaceutical industry in India and US
C702.4	Describe approval process and regulatory requirements for drug products

Course Name : Pharmacy Practice (Theory)
Course Code : BP703T
Year of study : 4th B.Pharmacy 7th Semester

C703.1	Know various drug distribution methods in a hospital.
C703.2	Compare the pharmacy stores management and inventory control.
C703.3	Compute drug therapy of patient through medication chart review and

	clinical review
C703.4	Collect medication history interview and counsel the patients. Detect and assess adverse drug reactions, Identify drug related problems.
C703.5	Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states
C703.6	Know pharmaceutical care services ,Appreciate the concept of rational drug therapy, Do patient counseling in community pharmacy
Course Name : Novel Drug Delivery Systems (Theory) **Course Code:** BP704T **Year of study :**4th B.Pharmacy 7th Semester	
C704.1	List out various approaches for development of novel drug delivery systems.
C704.2	Employ the criteria for selection of drugs and polymers for the development of Novel drug delivery systems, their formulation and evaluation
Course Name : Instrumental Methods of Analysis (Practical) **Course Code :** BP705P **Year of study :** 4th B.Pharmacy 7th Semester	
C705.1	Recall the principle involved in spectroscopy and importance of absorption maximum in the estimation of organic compounds
C705.2	Experiment with selected drugs by UV, Visible spectroscopy and flourimetry
C705.3	Estimate the amount of sodium and potassium ions by flame Photometry
C705.4	Corelate the characterize and quantify the organic compounds/amino acids/plant pigments by using various chromatographic and spectroscopical techniques
C705.5	Analyze the various organic compounds using Nepheloturbidimetry
C705.6	Recognize the knowledge on integration and interpretation of chromatograms and spectra.

Course Name: Practice School
Course code: BP 706PS, **Year of study:** 4th B.Pharmacy 7th Semester

C706.1	Understand the importance of realistic learning through practice in various domains such as community pharmacy, drug testing and manufacturing, preclinical testing, clinical practice, patent filing, regulatory filing accounting, green audit and article writing
C706.2	Review the aspects of realistic practice in the domain of interest
C706.3	Develop knowledge and skills related to practical learning in the domain of interest
C706.4	Analyze the problems encountered during realistic practice and make use of theoretical knowledge to resolve those problems.
C706.5	Build up the ability to perform well in the domain of interest after becoming an employee/entrepreneur

IV/IV B.PHARMACY 8th SEMESTER
Course Name : Research methodology and Biostatistics (Theory)
Course Code : BP801T
Year of study :4th B.Pharmacy 8th Semester

CB801.1	Select a research topic in his/her areas of interest.
CB801.2	Discover the fundamentals of collecting, analyzing and interpreting the relevant data.
CB801.3	Differentiate computational methods and software‘s facilitating research

Course Name : Social and Preventive Pharmacy (Theory)
Course Code : BP802T
Year of study :4th B.Pharmacy 8th Semester

CB802.1	Construct b high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide.
CB802.2	Discuss with critical way of thinking based on current health care development
CB802.3	Evaluate alternative ways of solving problems related to health and pharmaceutical issues

Course Name : Pharma Marketing Management (Theory)
Course Code : BP803 ET
Year of study : 4th B.Pharmacy 8th Semester

CB803.1	Facilitate the marketing concepts and techniques and the application of the same in the pharmaceutical industry

Course Name : Pharmaceutical Regulatory Science (Theory)
Course Code :BP804 ET,
Year of study: 4th B.Pharmacy 8th Semester

C804.1	Know about the process of drug discovery and development
C804.2	Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
C804.3	Know the regulatory approval process and their registration in Indian and international markets

Course Name : Pharmacovigilance (Theory)
Course Code : BP805 ET
Year of study:4th B.Pharmacy 8th Semester

C805.1	Describe the history of pharmacoivigilance, adverse drug reactions and basic terminologies in Pharmacovigilance
C805.2	Use of various drug disease classifications, drug dictionaries and drug information resources in pharmacovigilance
C805.3	Explain various methods of pharmacovigilance and communication process during ADR reporting
C805.4	Appraise safety data generation and ICH guidelines in Pharmacovigilance
C805.5	Evaluate drug and vaccine safety in special population and to appraise the process of Pharmacovigilance and materiovigilance.
C805.6	Build the ability to report adverse drug reactions through various ADR reporting forms

Course Name : Quality control and standardization of Herbals (Theory)
Course Code : BP806 ET
Year of study :4th B.Pharmacy 8th Semester

C806.1	Explain about WHO guidelines for quality control of herbal drugs
C806.2	Discuss about Quality assurance in herbal drug industry
C806.3	Know the regulatory approval process and their registration in Indian and international markets

Course Name : Computer aided drug design (Theory)
Course Code : BP807 ET
Year of study : 4th B.Pharmacy 8th Semester

C807.1	Design and discovery of lead molecules
C807.2	Justify the role of drug design in drug discovery process
C807.3	Justify the concept of QSAR and docking
C807.4	Modify the various strategies to develop new drug like molecules
C807.5	Design of new drug molecules using molecular modeling software

Course Name : Cell and Molecular Biology (Elective Subject))
Course Code : BP808 ET
Year of study :4th B.Pharmacy 8th Semester

C808.1	Summarize cell and molecular biology history.
C808.2	Summarize cellular functioning and composition
C808.3	Describe the chemical foundations of cell biology
C808.4	Summarize the DNA properties of cell biology.
C808.5	Describe protein structure and function.
C808.6	Describe cellular membrane structure and function.

Course Name : Cosmetic Science
Course Code : BP809 ET
Year of study :4th B.Pharmacy 8th Semester

C809.1	Explain the cosmetic principles to address the needs of cosmetic industry
C809.2	Understand formulation science and analytical techniques required to scientifically design and develop cosmetic products

C809.3	Explain the scientific and technical aspects, high standards of practice and professional ethics within the cosmetic and toiletries industry
Course Name : Pharmacological Screening Methods **Course Code :** BP810 ET **Year of study :**4th B.Pharmacy 8th Semester	
C810.1	List the applications of various commonly used laboratory animals
C810.2	Demonstrate the various screening methods used in preclinical research
C810.3	Demonstrate the importance of biostatistics and research methodology
C810.4	Design and execute a research hypothesis independently
Course Name : Advanced Instrumentation Techniques **Course Code :** BP811 ET **Year of study :**4th B.Pharmacy 8th Semester	
C811.1	Understand the advanced instruments used and its applications in drug analysis
C811.2	Understand the chromatographic separation and analysis of drugs
C811.3	Understand the calibration of various analytical instruments know analysis of drugs using various analytical instruments.

THE DALE VIEW COLLEGE OF PHARMACY AND RESEARCH CENTRE

COURSE OUTCOMES - M PHARMCEUTICAL CHEMISTRY

Course Name: Advanced organic chemistry **Course code :**I (MPC 102T) **Year of Study : I/IV M.PHARMACY 1st SEMESTER**	
CO1	Describe the principles and applications of retro synthesis
CO2	Describe mechanism and applications of various named reactions
CO3	Discuss the concept of disconnection to develop synthetic routes for small target molecule.
CO4	List the various catalysts used in organic reactions
CO5	Explain the chemistry of heterocyclic compounds
Course Name : Advanced Medical chemistry **Course code :**(MPC 103 T) **Year of Study : I/IV M.PHARMACY 1st SEMESTER**	
CO1	Explain role of medicinal chemistry in drug research
CO2	Differentiate the techniques used for drug discovery
CO3	List out the various strategies to design and develop new drug like molecules for biological targets
CO4	Describe about Peptidomimetics
Course Name : Chemistry of natural products **Course code :**(MPC 104 T) **Year of Study : I/IV M.PHARMACY 1st SEMESTER**	
CO1	Differentiate the types of natural compounds and their chemistry and medicinal importance
CO2	Importance of natural compounds as lead molecules for new drug discovery
CO3	Explain the concept of rDNA technology tool for new drug discovery
CO4	Generalize methods of structural elucidation of compounds of natural origin
CO5	Describe Isolation, purification and characterization of simple chemical constituents from natural source
Course Name : Pharmaceutical chemistry practical **Course code :**(MPC 105 P) **Year of Study : I/IV M.PHARMACY 1st SEMESTER**	
CO1	Analyze of Pharmacopeial compounds and their formulations by UV Vis spectrophotometer, RNA & DNA estimation
CO2	Estimate multi component containing formulations by U V

	Spectrophotometry
CO3	Experiment based on Column chromatography, HPLC, Gas Chromatography
CO4	Estimate riboflavin/quinine sulphate by fluorimetry
CO5	Estimate of sodium/potassium by flame photometry
Course Name : Advanced spectral analysis **Course code :**MPC 201T **Year of Study : I/IV M.PHARMACY 2 nd SEMESTER**	
CO1	List out theoretical and practical skills of the hyphenated instruments
CO2	Identify the organic compounds
CO3	Interpret the NMR, Mass and IR spectra of various organic compounds
Course Name : Advanced organic chemistry - II **Course code :**MPC 202T **Year of Study : I/IV M.PHARMACY 2 nd SEMESTER**	
CO1	Discuss about the concept of peptide chemistry.
CO2	Describe correlate the principles and applications of Green chemistry
CO3	List out the various catalysts used in organic reactions
CO4	Compare the concept of stereochemistry and asymmetric synthesis.
Course Name : Computer aided drug design **Course code :**MPC 203T **Year of Study : I/IV M.PHARMACY 2 nd SEMESTER**	
CO1	Discuss role of CADD in drug discovery
CO2	Differentiate CADD techniques and their applications
CO3	List out the various strategies to design and develop new drug like molecules
CO4	Function with molecular modeling softwares to design new drug molecules
CO5	Describe the in silico virtual screening protocols
Course Name : PHARMACEUTICAL PROCESS CHEMISTRY **Course code :**MPC 204T **Year of Study : I/IV M.PHARMACY 2 nd SEMESTER**	
CO1	Indicate strategies of scale up process of apis and intermediates
CO2	List out the various unit operations and various reactions in process chemistry
Course Name : PHARMACEUTICAL CHEMISTRY PRACTICALS – II **Course code :**MPC 205P **Year of Study : I/IV M.PHARMACY 2 nd SEMESTER**	
CO1	Explain Synthesis of organic compounds by adapting different approaches by Oxidation Reduction, Nitration
CO2	Compare the absorption spectra by UV and Wood ward – Fieser rule

CO3	Identify the organic compounds using FT-IR, NMR, CNMR and Mass spectra
CO4	Prepare the organic compound
CO5	Estimate the purity by DSC in pharmaceuticals
CO6	Determine of log P, MR, hydrogen bond donors and acceptors of selected drugs using software

THE DALE VIEW COLLEGE OF PHARMACY AND RESEARCH CENTRE, PUNALAL
COURSE OUTCOME
MPHARM PHARMACEUTICS

COURSE NAME: MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES **COURSE CODE: MPT101T** **YEAR OF THE STUDY: I/I SEM**	
CO 1	Recognize the importance of modern instruments in the pharmaceutical analysis.
CO2	Discuss the fundamental principles and applications of UV-visible, IR, flame emission, atomic absorption, NMR and Mass spectroscopy.
CO3	Hypothesize the principles and applications of chromatographic and electrophoretic separation techniques.
CO4	Appraise X-ray crystallographic methods and radio immunological assays.
CO5	Summarize the instrumentation of the modern analytical techniques.
CO6	Assess appropriate techniques for the analysis of various drugs and formulations
COURSE NAME : ADVANCED BIOPHARMACEUTICS AND PHARMACOKINETICS **COURSE CODE :MPH 202T** **YEAR OF THE STUDY :I/II SEM**	
CO 1	Recall the different mechanisms and factors affecting ADME processes.
CO 2	Discuss the concepts of bioavailability and bioequivalence with the methods of measurement.
CO 3	Select official dissolution models for various novel drug delivery systems.
CO 4	Compare and analyze the *in vitro* drug release profiles for different marketed products.
CO 5	Analyze various pharmacokinetic and pharmacodynamic parameters affecting bioavailability.
CO 6	Appraise the applications of biopharmaceutics and pharmacokinetics in the development of biopharmaceuticals and pharmaceuticals.

COURSE NAME : COMPUTER AIDED DRUG DEVELOPMENT
COURSE CODE :MPH203T
YEAR OF THE STUDY :I/II SEM

CO 1	Explain the history of computers in pharmaceutical research and development.
CO 2	Structure computational modeling of drug disposition.
CO 3	Illustrate the applications of computer in preclinical development.
CO 4	Apply the approaches of optimization techniques in pharmaceutical formulation.
CO 5	Predict the market analysis of pharma products and clinical data management using softwares.
CO 6	Apply the role of computers in robotics, computational fluid dynamics and pharmaceutical automation process

COURSE NAME : COSMETICS AND COSMACEUTICALS
COURSE CODE :MPH204T
YEAR OF THE STUDY :I/II SEM

CO 1	Explain regulatory requirements for cosmetics.
CO 2	Correlate the relation between body parts and cosmetics applications.
CO 3	Identify suitable excipients for cosmetical preparations.
CO 4	Formulate and evaluate various cosmetic products.
CO 5	Develop various delivery systems for herbal cosmetics.
CO6	Discuss recent trends and advances in cosmetics and cosmeceuticals.

COURSE NAME : DRUG DELIVERY SYSTEMS **COURSE CODE :MPH102T** **YEAR OF THE STUDY :I/I SEM**	
CO I	Discuss the physiology of Gastro-intestinal Tract (G.I.T.) and the strategies for oral drug delivery.
CO 2	Identify suitable polymers for specific controlled drug delivery systems.
CO 3	Select specific delivery systems for protein and peptide drugs.
CO 4	Outline the approaches for parenteral controlled drug delivery systems.
CO 5	Develop various delivery systems for controlled release / a specific drug target.
CO6	Discuss recent trends and advances in novel oral and parenteral controlled drug delivery systems.
COURSE NAME : MODERN PHARMACEUTICS **COURSE CODE :MPH103T** **YEAR OF THE STUDY :I/I SEM**	
CO 1	Explain the process of compaction and compression in solid dosage form development.
CO 2	Discuss various preformulation concepts in dosage form development.
CO 3	Apply the cGMP and Industrial management principles in dosage form development.
CO 4	Develop new dosage forms by applying the principles of optimization.
CO 5	Design validation protocol for solid and liquid dosage forms.
CO6	Discuss recent advances in preformulation concepts, cGMP, validation, optimization, compression and compaction principles.

COURSE NAME : MOLECULAR PHARMACEUTICS **COURSE CODE :MPH201T** **YEAR OF THE STUDY: I/II SEM**	
CO 1	Explain the various approaches for development of novel drug delivery systems.
CO 2	Explain the need for drug targeting in terms of site and target specificity.
CO 3	Identify and discuss suitable polymers/excipients for formulation design.
CO 4	Design and develop various delivery systems for a specific drug target.
CO 5	Evaluate the developed targeted drug delivery system.
CO 6	Analyse and recommend formulation approaches and pharmaceutical processes for site specific drug delivery.
COURSE NAME : PHARMACEUTICS PRACTICAL – I **COURSE CODE :MPH105P** **YEAR OF THE STUDY :I/I SEM**	
CO 1	Evaluate therapeutic agents by various instrumental analytical techniques.
CO 2	Determine the preformulation studies for development of various dosage forms.
CO 3	Design and optimize various types of controlled oral, transdermal and mucosal drug delivery systems.
CO4	Evaluate various developed drug delivery systems using suitable methods.
CO 5	Predict pharmaceutical factors affecting drug release kinetics.
COURSE NAME : PHARMACEUTICS PRACTICALS - II **COURSE CODE :MPH205P** **YEAR OF THE STUDY :I/II SEM**	
CO 1	Compare the dissolution efficiency of various marketed pharmaceutical products.
CO 2	Formulate and evaluate various cosmetic products.
CO 3	Design experiments based on QbD for optimization of drug delivery.

CO 4	Analyze and predict pharmacokinetic parameters using softwares.
CO 5	Evaluate computational modeling of drug disposition.
COURSE NAME : REGULATORY AFFAIRS **COURSE CODE :MPH104T** **YEAR OF THE STUDY :I/I SEM**	
CO 1	Discuss the concepts of innovator and generic drugs in drug development process.
CO 2	Organize the process involved in new drug application of pharmaceuticals.
CO 3	Structure the guidelines for filing and approval process in different countries.
CO 4	Analyze the post approval regulatory requirements for actives and drug products and submission of global documents in Common Technical Document / eCTD formats.
CO 5	Identify regulatory procedures involved in non-clinical and clinical drug development.
CO 6	Apply the principles of regulatory affairs in drug development process, filing and approval, non-clinical and clinical drug development in global scenario.
COURSE NAME : RESEARCH METHODOLOGY & BIOSTATISTICS **COURSE CODE : MRM301** **YEAR OF THE STUDY: II/IIISEM**	
CO 1	Recognize the value, scope, objective and requirements of research.
CO2	Discuss the basic concept and importance of statistical analysis.
CO 3	Discuss the basic principles of medical research.
CO 4	Describe the guidelines for the maintenance of laboratory animals.
CO 5	Construct the profession of Pharmacy with code of conduct and ethics.
CO 6	Apply the principles of medical research for the development of knowledge in the field of medicine.
COURSE NAME : DISCUSSION / SYNOPSIS PRESENTATION **COURSE CODE :MPH** **YEAR OF THE STUDY :I/I SEM**	
CO 1	Identify the research problem.
CO 2	Discuss research problem with team and peers for solution.

CO 3	Develop a protocol report on the critically appraised research problem.
CO 4	Prepare the critically appraised research problem in appropriate forum.
COURSE NAME : GROUP PROJECT **COURSE CODE :MPH** **YEAR OF THE STUDY :I/I SEM**	
CO 1	Apply concepts of pharmaceutical sciences for executing the project & Work in a team; undertake a project in the area of Pharmaceutical Sciences.
CO 2	Apply appropriate research methodology while formulating a project.
CO 3	Demonstrate specifications, synthesize, analyse, develop and evaluate a project.
CO 4	Defend the project, exhibit, make a presentation and document the work
COURSE NAME : JOURNAL CLUB **COURSE CODE :MPH** **YEAR OF THE STUDY :I/I SEM**	
CO 1	Select scientific articles from reputed journals.
CO 2	Develop a report on the critically appraised article.
CO 3	Compose the critically appraised article in appropriate forum.
COURSE NAME : RESEARCH METHODOLOGY AND BIOSTATISTICS **COURSE CODE:MPH** **YEAR OF THE STUDY :I/I SEM**	
CO 1	Recognize the value, scope, objective and requirements of research.
CO 2	Discuss the basic concept and importance of statistical analysis.
CO 3	Outline the basic principles of medical research
CO 4	Summarize the guidelines for the maintenance of laboratory animals
CO 5	Perform the profession of Pharmacy with code of conduct and ethics
CO 6	Apply the principles of medical research for the development of knowledge in the field of medicine

COURSE NAME : DISCUSSION / COLLOQUIUM PRESENTATION **COURSE CODE :MPH** **YEAR OF THE STUDY :I/I SEM**	
CO 1	Discuss research problem with team and peers for solution.
CO 2	Develop a protocol report on the critically appraised research problem.
CO 3	Compose the critically appraised research problem in appropriate forum .
COURSE NAME : RESEARCH WORK **COURSE CODE :MPH** **YEAR OF THE STUDY :I/I SEM**	
CO 1	Review scholarly literature collected from various sources critically for the project and formulates a research problem.
CO 2	Construct and present a research proposal.
CO 3	Design research work to achieve research objectives.
CO 4	Propose new ideas/ methodologies or procedures for further improvement of the research problem.
CO 5	Create research document of the findings.
CO 6	Defend the research findings in front of scholarly audience.

THE DALE VIEW COLLEGE OF PHARMACY AND RESEARCH CENTRE,

PUNALAL

COURSE OUTCOME PHARM D

Course Name : Human Anatomy and Physiology (Theory) **Course code :** 1.1 **Year of Study : 1st YEAR PHARM D**	
CO 1	Describe the structure (gross and histology) and functions of various organs of the human body
CO 2	Discuss the various homeostatic mechanisms and their imbalances of various systems
CO 3	Identify the various tissues and organs of the different systems of the human body
CO 4	Recognize coordinated working pattern of different organs of each systems
CO 5	Recognize the interlinked mechanisms in the maintenance of normal functioning of human body
Course Name : Human Anatomy and Physiology (Practical) **Course code :** 1.1 **Year of Study : 1st YEAR PHARM D**	
CO 1	Illustrate different types of Tissues and explain various Anatomical models
CO 2	Identify the bones of Skeletal system
CO 3	Determine Blood cell count, Hemoglobin, Blood grouping, ESR, Bleeding time and Clotting time
CO 4	Record Blood Pressure, Pulse rate, Body temperature
CO 5	Identify family planning devices and conduct Pregnancy diagnosis test
CO 6	Conduct planned experiments and prepare laboratory report in a standard format
Course Name : Pharmaceutics (Theory) **Course code :** 1.2 **Year of Study : 1st YEAR PHARM D**	
CO 1	Describe the evolution of Pharmacy and Pharmacopoeias
CO 2	Discuss the need and identification of different dosage forms
CO 3	Design a suitable formulation/dosage form with the use of appropriate ingredients

CO 4	Discuss the different techniques involved in formulation of a dosage form
CO 5	Analyze the instabilities observed in formulations and suggest suitable remedial measures to overcome the instabilities of dosage form
CO 6	Prepare appropriate labels and recommend storage conditions for dosage forms
Course Name : Pharmaceutics (Practical) **Course code :** 1.2 **Year of Study : 1st YEAR PHARM D**	
CO 1	Formulate various solid and liquid dosage forms
CO 2	Demonstrate different techniques involved in formulation
CO 3	Identify and apply the suitable remedial measures to solve instabilities observed in formulations
CO 4	Prepare appropriate labels for dosage forms
CO 5	Conduct planned experiments and prepare laboratory report in a standard format
Course Name : Medicinal Biochemistry(Theory) **Course code :** 1.3 **Year of Study : 1st YEAR PHARM D**	
CO 1	Describe the concepts of biological oxidation and bio energetics
CO 2	Explain the metabolism of carbohydrate, proteins and lipids
CO 3	Discuss various concepts of nucleotides and nucleic acids
CO 4	Recognise and discuss the role of catalytic activity of enzymes and importance of isoenzymesA in diagnosis of disease
CO 5	Discuss the principles, significance and methods of different biochemical tests
CO 6	Interpret the results of biochemical tests such as lipid profile test, liver and kidney function tests
Course Name : Medicinal Biochemistry(Practical) **Course code :** 1.3 **Year of Study : 1st YEAR PHARM D**	
CO 1	Determine the biomolecules by qualitative and quantitative analysis of urine and blood samples
CO 2	Interpret the metabolic disorders based on laboratory value
CO 3	Interpret the lipid profile and liver function tests
CO 4	Determine various electrolytes in serum
CO 5	Operate and handle appropriate standard instrument
CO 6	Conduct planned experiments and prepare laboratory report in a standard format
Course Name : Pharmaceutical Organic Chemistry(Theory) **Course code :** 1.4 **Year of Study : 1st YEAR PHARM D**	
CO 1	Explain the physical properties of organic compounds

CO 2	Identify the structures of a given organic compound and give the nomenclature
CO 3	Explain the mechanisms involved in various organic reactions
CO 4	Discuss the reactivity, orientation and stability of organic reactions
CO 5	Identify the products obtained through simple organic reactions
CO 6	Summarize the studies on some important official organic compound.
Course Name : Pharmaceutical organic chemistry (Practical) **Course code :** 1.4 **Year of Study : 1st YEAR PHARM D**	
CO 1	Synthesize simple organic compounds by different organic reactions
CO 2	Apply stereo models and explain the structural aspects of organic compounds
CO 3	Detect the extra elements (N,S and X) present in the compounds
CO 4	Identify various classes of organic compounds by systematic qualitative analysis
CO 5	Prepare suitable solid derivatives from organic compounds
CO 6	Conduct planned experiments and prepare laboratory report in a standard format
Course Name : Pharmaceutical Inorganic Chemistry(Theory) **Course code :** 1.5 **Year of Study : 1st YEAR PHARM D**	
CO 1	Explain the effects of impurities in pharmaceutical
CO 2	Discuss the principles and methodology of limit tests for common impurities in pharmaceutical substances
CO 3	Suggest methods to prepare inorganic pharmaceuticals
CO 4	Recommend storage conditions for inorganic pharmaceuticals
CO 5	Estimate the inorganic medicinal substances and interpret their percentage purity
CO 6	Explain basics of radio activity and recognize the role of essential trace elements
Course Name : Pharmaceutical Inorganic Chemistry(Practicals) **Course code :** 1.5 **Year of Study : 1st YEAR PHARM D**	
CO 1	Identify the impurities in given inorganic compounds by performing limit tests
CO 2	Analyze the purity of compound quantitatively by performing assays.
CO 3	Use different methods to prepare inorganic pharmaceuticals
CO 4	Perform identification tests as per Indian Pharmacopoeia
CO 5	Determine the impurities qualitatively by performing test for purity
CO 6	Conduct planned experiments and prepare laboratory report in a standard format

Course Name : Remedial Biology-(Theory) **Course code** : 1.6 **Year of Study** : **1st YEAR PHARM D**	
CO 1	Explain the classification of plants, plant cell and its organelles, types of tissues and their functions
CO 2	Explain physiological aspects of plants
CO 3	Describe taxonomical characters of various families
CO 4	Classify plants based on morphological and microscopical characters
CO 5	Identify a given plant part based on its morphological and microscopical characters
CO 6	Discuss structure and life history of parasites/insects
Course Name : Remedial Biology(Practical) **Course code** : 1.6 **Year of Study** : **1st YEAR PHARM D**	
CO 1	Identify cell wall constituents and cell inclusions
CO 2	Identify the crude drugs by its morphological characteristics and study the anatomical characters by preparing slides
CO 3	Perform experiments related to plant physiology
CO 4	Identify different parts of frog digestive system
CO 5	Conduct planned experiments and prepare laboratory report in a standard format
Course Name : Remedial Mathematics-(Theory) **Course code** : 1.6 **Year of Study** : **1st YEAR PHARM D**	
CO 1	Explain the principles of matrix algebra, determinants, Trigonometry, Analytical Geometry, Differential Calculus, Integral Calculus, Differential Equations and Laplace Transform
CO 2	State and explain the important theorems such as Cayley-Hamilton Theorem, adjoint Cramer's rule and Leibritz Theorem
CO 3	Identify the appropriate standard form for a given differential equation
CO 4	Solve simple and complex mathematical problems associated with on trigonometry and analytical geometry
CO 5	Solve simple mathematical problems associated with on matrix algebra, differential and integral calculus as well as Laplace Transforms
CO 6	Solve complex mathematical problems associated with on matrix algebra, differential equations, differential and integral calculus as well as Laplace Transforms
Course Name : Pathophysiology-(Theory) **Course code** : 2.1 **Year of Study** : **2nd YEAR PHARM D**	
CO 1	Explain the pathogenesis and morphology of reversible and irreversible cell injury; enumerate various lipoproteins and describe lipoprotein disorders

CO 2	Illustrate events involved in acute and chronic inflammation
CO 3	Recognize the biological significance of various hypersensitivity disorder
CO 4	Discuss the mechanisms involved in autoimmune diseases and allograft rejection
CO 5	Discuss the ethiopathogenesis of selected diseases
CO 6	Describe the general biology of cancer, mechanism of shock and effects of radiation exposure
Course Name : Pharmaceutical Microbiology -(Theory) **Course code :** 2.2 **Year of Study : 2nd YEAR PHARM D**	
CO 1	Identify the key growth parameters required by micro-organisms
CO 2	Explain the principles of sterilization used in the pharmaceutical industry
CO 3	Explain the principles of sterility testing and microbiological quality control of pharmaceuticals
CO 4	Discuss the concepts of immunology and interpolate the same in disease diagnosis
CO 5	Analyze the techniques for microbiological assays
Course Name : Pharmaceutical Microbiology -(Practical) **Course code :** 2.2 **Year of Study : 2nd YEAR PHARM D**	
CO 1	Prepare various culture media for the growth of microorganisms
CO 2	Identify and isolate bacteria
CO 3	Demonstrate aseptic procedures
CO 4	Carry out sterilization and sterility testing of pharmaceuticals
CO 5	Evaluate antimicrobials and determine the MIC of antimicrobial agents
CO 5	Conduct planned experiments and prepare laboratory report in a standard format
Course Name : Pharmacognosy & Phytopharmaceuticals -(Theory) **Course code :** 2.3 **Year of Study : 2nd YEAR PHARM D**	
CO 1	Define Pharmacognosy and describe its evolution
CO 2	Explain the classification of crude drugs and discuss their primary and secondary metabolites
CO 3	Discuss various parameters related to cultivation, collection, processing and storage of crude drugs
CO 4	Analyse morphological and microscopical characters of crude drugs
CO 5	Discuss the production, evaluation, uses and adulterants of crude drugs
CO 6	Identify the market samples of drugs containing proteins, carbohydrates and lipids

Course Name : Pharmacognosy & Phytopharmaceuticals -(Practicals) **Course code** : 2.3 **Year of Study** : **2nd YEAR PHARM D**	
CO 1	Identify cell wall constituents and cell inclusions
CO 2	Identify the crude drugs by its morphological characteristics and study the anatomical characters by preparing slides
CO 3	Perform chemical tests to identify unorganized crude drugs and lipids
CO 4	Prepare herbarium sheets
CO 5	Conduct planned experiments and prepare laboratory report in a standard format
Course Name : Pharmacology I -(Theory) **Course code** : 2.4 **Year of Study** : **2nd YEAR PHARM D**	
CO 1	Discuss pharmacokinetics and pharmacodynamics of a drug
CO 2	Recognize the factors modifying drug action
CO 3	Identify drug interactions and detect adverse drug reactions
CO 4	Classify and explain the pharmacology of drugs acting on various systems
CO 5	Apply the basics of pre-clinical and clinical evaluations in the development of new drugs
Course Name : Community Pharmacy-(Theory) **Course code** : 2.5 **Year of Study** : **2nd YEAR PHARM D**	
CO 1	Discuss the roles and responsibilities of community pharmacist
CO 2	Outline the layout and infrastructure requirements for community pharmacy
CO 3	Recognise the need of inventory control and discuss the various methods
CO 4	Discuss the factors affecting medication adherence
CO 5	Perform general patient counseling
CO 6	Apply health screening services in community pharmacy
Course Name : Pharmacotherapeutics I -(Theory) **Course code** : 2.6 **Year of Study** : **2nd YEAR PHARM D**	
CO 1	Explain the etiopathogenesis of selected diseases
CO 2	Explain the general prescribing guidelines and rational use of drugs
CO 3	Discuss the therapeutic approach in the management of selected diseases and controversies in drug therapy
CO 4	Prepare individualized therapeutic plans based on diagnosis
CO 5	Recognise the role of pharmacist in essential and rational drug use

Course Name : Pharmacotherapeutics I -(Practicals) **Course code** : 2.6 **Year of Study** : **2nd YEAR PHARM D**	
CO 1	Identify drug interactions and rationalize the prescription
CO 2	Prepare individualized therapeutic plans based on diagnosis
CO 3	Perform patient counseling
CO 4	Conduct planned experiments and prepare laboratory report in a standard format
Course Name : Pharmacology II (Theory) **Course code** : 3.1 **Year of Study** : **3rd YEAR PHARM D**	
CO 1	Discuss the pharmacological aspects of drugs acting on blood and renal System
CO 2	Discuss the pharmacological aspects of chemotherapeutic agents used in various diseases
CO 3	Explain the pharmacology of immunosuppresants and principles of animal toxicology
CO 4	Illustrate the chromosome structure and DNA replication
CO 5	Recognise the fundamentals and importance of cell biology in cell signaling pathways
CO 6	Analyse the principles and processes of Recombinant DNA technology
Course Name : Pharmacology II (Practical) **Course code** : 3.1 **Year of Study** : **3rd YEAR PHARM D**	
CO 1	Demonstrate intraperitoneal and intramuscular routes of administration of drugs in animals and describe different anaesthetics used in laboratory animals
CO 2	Identify and select laboratory appliances used in experimental pharmacology
CO 3	Recommend the physiological salt solution for different isolated tissue preparations
CO 4	Perform a bioassay procedure and create a Dose Response Curve
CO 5	Demonstrate the screening of a drug for CNS activity
CO 6	Conduct planned experiments and prepare laboratory report in a standard format
Course Name : Pharmaceutical Analysis (Theory) **Course code** : 3.2 **Year of Study** : **3rd YEAR PHARM D**	
CO 1	Explain the importance of modern instrumentation in pharmaceutical analysis
CO 2	Describe the fundamental principles and applications of UV-visible, IR, NMR, Mass spectroscopy
CO 3	Describe the fundamental principles and applications of Flame photometry, ,

	X-ray diffraction, atomic emission and atomic absorption spectroscopy
CO 4	Interpret various spectra such as IR, NMR and Mass to identity the given compound
CO 5	Identify appropriate instrumentation for the analysis of various compounds
CO 6	Discuss the concepts of total quality management, quality validation methods and quality review
Course Name : Pharmaceutical Analysis **(Practical)** **Course code** : 3.2 **Year of Study : 3rd YEAR PHARM D**	
CO 1	Operate and handle instruments such as UV-visible and IR spectrophotometer to obtain the spectra of a given sample
CO 2	Interpret spectra of UV-visible, IR, NMR and Mass to identity the given compound
CO 3	Correlate spectral data with chemical structure
CO 4	Estimate the quantity of a drug in a given mixture or solution
CO 5	Conduct planned experiments and prepare laboratory report in a standard format
Course Name : Pharmacotherapeutics -II (Theory) **Course code** : 3.3 **Year of Study : 3rd YEAR PHARM D**	
CO 1	Explain the etiopathogenesis of selected infectious diseases, musculoskeletal and renal disorders
CO 2	Discuss the principles of cancer therapy and dermatological disorders
CO 3	Identify the patient-specific parameters relevant in initiating and monitoring drug therapy and adverse effects
CO 4	Discuss the therapeutic approach in the management of selected diseases and controversies in drug therapy
CO 5	Prepare individualized therapeutic plans based on diagnosis
CO 6	Recognise the role of pharmacist in essential and rational drug use
Course Name : Pharmacotherapeutics -II (Practical) **Course code** : 3.3 **Year of Study : 3rd YEAR PHARM D**	
CO 1	Identify drug interactions and rationalize the prescription
CO 2	Discuss the therapeutic approach to management of selected diseases
CO 3	Prepare individualized therapeutic plans based on diagnosis
CO 4	Perform patient counseling
CO 5	Conduct planned experiments and prepare laboratory report in a standard format

Course Name : Pharmaceutical Jurisprudence(Theory) **Course code** : 3.4 **Year of Study** : **3rd YEAR PHARM D**	
CO 1	Explain the evolution of pharmacy as a profession in India and emergence of regulatory bodies
CO 2	Discuss the importance of code of pharmaceutical ethics
CO 3	Recognize the provisions of various acts pertaining to drugs and cosmetics
CO 4	Explain the latest amendments with respect to New Drug policy, DPCO and Patent and design act
CO 5	Discuss the concepts of price fixation of pharmaceutical products
CO 6	Outline the concepts of Narcotic and Psychotropic Substances Act, Pharmacy Act and Excise duties Act
Course Name : Medicinal Chemistry(Theory) **Course code** : 3.5 **Year of Study** : **3rd YEAR PHARM D**	
CO 1	Discuss the relationship between the structures of medicinal compounds with their biological activity
CO 2	Explain the concept of rational drug design including combinatorial chemistry and computer aided drug design
CO 3	Identify the structures of a given medicinal compound and give the nomenclature
CO 4	Synthesise a drug molecule using available synthetic and new path ways
CO 5	Explain the mode of action, mode of resistance, therapeutic uses and side effects of drugs
Course Name : Medicinal Chemistry(Practical) **Course code** : 3.5 **Year of Study** : **3rd YEAR PHARM D**	
CO 1	Synthesis compounds of medicinal interest
CO 2	Conduct monograph analysis of the pharmaceutical compounds
CO 3	Determine the amount of drug present in an unknown solution
CO 4	Estimate the purity of drugs by performing assays
CO 5	Determine partition coefficient and dissociation constant of a given compound
CO 6	Conduct planned experiments and prepare laboratory report in a standard format
Course Name : Pharmaceutical Formulations(Theory) **Course code** : 3.6 **Year of Study** : **3rd YEAR PHARM D**	
CO 1	Explain the significance of formulation, preparation and

	evaluation of various pharmaceutical dosage forms
CO 2	Discuss formulation additives for various dosage forms
CO 3	Explain suitable measures for stability of the dosage forms
CO 4	Describe the manufacturing methods of solid, semisolid, parenteral and ophthalmic products
CO 5	Evaluate different dosage forms with appropriate quality control test for a given drug
CO 6	Recommend suitable packaging material for a dosage form of a given Drug
Course Name : Pharmaceutical Formulations **(**Practical) **Course code :** 3.6 **Year of Study : 3rd YEAR PHARM D**	
CO 1	Prepare formulations of different dosage forms as per the batch formula
CO 2	Operate different equipments and instruments used in preparation of dosage forms
CO 3	Select suitable packaging container for a dosage form
CO 4	Evaluate different dosage forms by performing quality control tests
CO 5	Prepare and evaluate cosmetics such as lipstick, cold cream and shampoo
CO 6	Conduct planned experiments and prepare laboratory report in a standard format
Course Name : Pharmacotherapeutics III(Theory) **Course code :** 4.1 **Year of Study : 4th YEAR PHARM D**	
CO 1	Explain the etiopathogenesis of selected gastrointestinal, haematological, neurological and psychiatric diseases
CO 2	Discuss the principles of evidence based therapy and pain management
CO 3	Identify the patient specific parameters relevant in initiating and monitoring drug therapy and adverse effects
CO 4	Discuss the therapeutic approach in the management of selected diseases and controversies in drug therapy
CO 5	Prepare individualized therapeutic plans based on diagnosis
CO 6	Recognise the role of pharmacist in essential and rational drug use
Course Name : Pharmacotherapeutics III(Practical) **Course code :** 4.1 **Year of Study : 4th YEAR PHARM D**	
CO 1	Identify drug interactions and rationalize the prescription
CO 2	Discuss the therapeutic approach to management of selected diseases
CO 3	Prepare individualized therapeutic plans based on diagnosis
CO 4	Conduct patient counseling
CO 5	Conduct planned experiments and prepare laboratory report in a standard format

Course Name : Hospital Pharmacy (Theory) **Course code** : 4.2 **Year of Study** : **4th YEAR PHARM D**	
CO 1	Discuss the roles and responsibilities of hospital pharmacist, hospital drug policies and guidelines for hospital pharmacy
CO 2	Discuss various drug distribution methods in a hospital pharmacy
CO 3	Apply various methods of inventory control
CO 4	Formulate parenteral preparations
CO 5	Contribute to a newsletter for providing continuous education and awareness
CO 6	Explain about handling and packaging of radiopharmaceuticals
Course Name : Hospital Pharmacy **(**Practical) **Course code** : 4.2 **Year of Study** : **4th YEAR PHARM D**	
CO 1	Analyse prescriptions for drug interaction
CO 2	Formulate and prepare parenteral formulations and powders
CO 3	Perform inventory analysis
CO 4	Answer drug information queries through literature search
CO 5	Conduct planned experiments and prepare laboratory report in a standard format
Course Name : Clinical Pharmacy (Theory) **Course code** : 4.3 **Year of Study** : **4th YEAR PHARM D**	
CO 1	Explain the roles and responsibilities of clinical pharmacist
CO 2	Analyse and interpret the laboratory test results for clinical diagnosis
CO 3	Conduct interview to elicit medication history and perform patient counseling
CO 4	Identify, monitor, assess, manage, prevent, document and report suspected adverse drug reactions
CO 5	Provide drug and poison information through critical analysis
CO 6	Recognise the potential sources of medication errors and act for its prevention
Course Name : Clinical Pharmacy **(**Practical) **Course code** : 4.3 **Year of Study** : **4th YEAR PHARM D**	
CO 1	Assess prescriptions for drug interaction and answer drug information query
CO 2	Perform patient counseling on medication and conduct medication history interview
CO 3	Analyse and interpret the data obtained through laboratory tests
CO 4	Conduct planned experiments and prepare laboratory report in a standard format

Course Name : Biostatistics and research methodology(Theory) **Course code** : 4.4 **Year of Study** : **4th YEAR PHARM D**	
CO 1	Recognise the importance of biostatistics in pharmacy
CO 2	Explain the importance of research methods in the design of pharmacoepidemiological study
CO 3	Discuss the methods of collection of data and its analysis and interpretation
CO 4	Identify appropriate statistical methods for data analysis
CO 5	Discuss and evaluate various software for statistical analysis of data
CO 6	Explain the various methods of testing hypothesis
Course Name : Biopharmaceutics and Pharmacokinetics(Theory) **Course code** : 4.5 **Year of Study** : **4th YEAR PHARM D**	
CO I	Discuss biopharmaceutics, pharmacokinetics, pharmacodynamics with their applications
CO 2	Explain the mechanisms and factors affecting ADME processes
CO 3	Discuss the significance of pharmacokinetics in the design and evaluation of dosage forms
CO 4	Differentiate between bioavailability and bioequivalence along with their measurement
CO 5	Identify and select the right pharmacokinetic model for drugs administered by different routes
Course Name : Biopharmaceutics and Pharmacokinetics(Practical) **Course code** : 4.5 **Year of Study** : **4th YEAR PHARM D**	
CO 1	Compare the *invitro* drug release profile of different marketed products
CO 2	Perform the solubility enhancement techniques for improvement of drug release of poorly water soluble drugs
CO 3	Estimate the bioavailability (absolute and relative) and bioequivalence from the given clinical data
CO 4	Calculate the drug content in blood sample using Area Under Curve approach
CO 5	Calculate and interpret various pharmacokinetic parameters from the given clinical data
CO 6	Conduct planned experiments and prepare laboratory report in a standard format

Course Name : Clinical Toxicology(Theory) **Course code :** 4.5 **Year of Study : 4th YEAR PHARM D**	
CO 1	Describe the mechanism of action of common poisons and antidotes
CO 2	Detect and differentiate acute and chronic poisoning by clinical symptoms
CO 3	Select appropriate laboratory tests to identify and determine the severity of poisoning
CO 4	Detect signs and symptoms of drug abuse and suggest suitable remedial measures
CO 5	Recommend the standard procedures to deal with cases of poisoning
Course Name : Clinical Research (Theory) **Course code :** 5.1 **Year of Study : 5th YEAR PHARM D**	
CO 1	Discuss the Pharmacological and Toxicological considerations in process of development of new drugs
CO 2	Discuss the principles and phases in clinical trial of drug
CO 3	Explain the guidelines for ethics and safe monitoring in clinical trial of a drug
CO 4	Design the documents of clinical trial
CO 5	Distinguish the guidelines of national and international regulatory bodies for clinical trial
CO 6	Recognise differing roles and obligations of the Investigator, Sponsor and Institutional Review Board
Course Name : Pharmacoepidemiology and Pharmacoeconomics(Theory) **Course code :** 5.2 **Year of Study : 5th YEAR PHARM D**	
CO 1	Discuss the scope, need, origin and evaluation of Pharmacoepidemiology
CO 2	Explain the importance of Measurement of outcomes in Pharmacoepidemiology
CO 3	Recommend suitable method for measuring the outcome of Pharmacoepidemiology for a disease
CO 4	Suggest an appropriate Pharmacoepidemiological method for a given drug and address the risks associated with Pharmacoepidemiological study
CO 5	Discuss the basic principles, role and relevance of Pharmacoeconomics in the development of a new drug
CO 6	Identify and justify an appropriate evaluation method for Pharmacoeconomics study of a disease

Course Name : Clinical Pharmacokinetics and Pharmacotherapeutics Drug Monitoring (Theory) **Course code :** 5.3 **Year of Study : 5th YEAR PHARM D**	
CO 1	Discuss the pharmacokinetic principles to individualize drug therapy in patient care situations
CO 2	Determine dose ,dosing intervals and dosage adjustments of a drug for a given patient
CO 3	Apply the principles of pharmacokinetics to analyse and predict drug interactions
CO 4	Prepare protocol for TDM of drugs for selected diseases
CO 5	Discuss the concept of genetic polymorphism in metabolism, transport and target of a drug
Course Name : CLERKSHIP **Course code :** 5.4 **Year of Study : 5th YEAR PHARM D**	
CO 1	Discuss the role of Pharmacist in clinical pharmacy services
CO 2	Demonstrate the skills of a clinical Pharmacist
CO 3	Discuss the available therapeutic options in the management of diseases
CO 4	Prepare a pharmaceutical care plan for a given case
CO 5	Detect ,Interpret and report medication errors and drug interactions
Course Name : PROJECT WORK **Course code :** 5.5 **Year of Study : 5th YEAR PHARM D**	
CO 1	Address a problem related to Pharmacy practice in hospital, community service or clinical set up with a wider perspective and generality
CO 2	Define the problem to be addressed and translate it into a statement of aim, objectives, scope and plan for the project
CO 3	Carry out and report an information survey and take account of findings in executing project
CO 4	Evaluate, select and apply relevant theories and techniques from the full range of courses studied using conceptual models and frameworks to enhance depth of understanding
CO 5	Select appropriate methodology for investigative work, taking into account the pros and cons of the alternatives available and develop solution proposals based on reasoned judgement
CO 6	Present a coherent, logically argued, fully referenced report and engage in a professional manner in a viva-voce discussion about the project

Course Name : INTERNSHIP
Course code : 6.1
Year of Study : 6th YEAR PHARM D

CO 1	Explain the Pathophysiology of disease states and the rationale for drug therapy
CO 2	Discuss the available therapeutic options to provide patient care in cooperation with patients, prescribers, and other members of an interprofessional health care team
CO 3	Identify, manage and use resources of the health care system, in cooperation with patients, prescribers, other health care providers
CO 4	Analyse the therapeutic approaches to promote health improvement, wellness, and disease prevention
CO 5	Demonstrate skills in monitoring of the National Health Programmes and schemes
CO 6	Develop leadership qualities to function effectively as a member of the health care team
CO 7	Communicate effectively with patients and the community

LEARNING OUTCOMES AND GRADUATES ATRIBUTES

B PHARM

PO1. **Pharmaceutical Knowledge**: **Apply** the knowledge of chemical and life sciences for discovery of various drugs for the treatment of wide range of health issues.

PO2. **Problem Analysis**: **Categorize and analyze** the pathophysiological conditions of various diseases and make use of principles involved in development of drugs from natural and synthetic sources.

PO3. Design/Development of solutions: **Utilize** the various resources from synthetic & natural origin and develop a lead molecule for the treatment of particular ailments with minimal side effects for the safety of public/environment.

PO4. **Conduct investigations of complex problems**: **Create** Research-based knowledge, research methods including design of experiments, analysis and interpretation of data for the synthesis of novel drug molecules.

PO5. **Modern tool Usage**: **Choose and apply** appropriate techniques, resources and modern software tools including prediction and modelling of lead molecules with appropriate considerations of toxic effects.

PO6. **The Pharmacist and society**: Apply the drug information by the contextual knowledge to create awareness about health, safety and legal issues among the population and also for exercising the responsibilities relevant to the pharmacy profession.

PO7. **Environment and sustainability**: **Summarize** the impact of societal and environmental factors for development of novel drug molecules by make use of contextual knowledge to develop sustainable methodologies for designing of the drug molecules from natural sources.

PO8. **Ethics**: **Apply** ethical principles and work towards professional ethics and render the responsibilities as per the norms of pharmacy profession.

PO9. **Individual and team work**: **Function** effectively as an individual, as a member or leader in diverse teams and in multidisciplinary settings.

PO10. **Communication: DISCUSS** effectively on emerging research topics among the students and academicians in order to explore thrust research areas, design documentation, make effective presentations, give and receive clear instructions.

PO11. **Project Management and finance**: **Illustrate** knowledge and interpret the theoretical aspects of Pharmaceutical management and apply these to one's own work, as a member or a leader in a team, to handle the projects and in multi-disciplinary environments.

PO12. **Life-long learning**: **Recognize** and utilize the advanced technological developments and adapt in the independent and lifelong learning within the broadest context.

M PHARM PHARMACEUTICS

PO1. Pharmaceutical Sciences knowledge: Apply the knowledge of Mathematics, Science, Pharmaceutical fundamentals, and a Pharmacy specialization to the solution of complex Pharmaceutical problems.

PO2: Physicochemical properties of Formulations: Importance of physical properties of the different pharmaceutical ingredients and the factors influencing them is very valuable for pharmaceutical dosage form design.

PO3: Unit Operations: Generalize and express knowledge about the basic unit operations that are taking place in pharmaceutical industry and the different factors associated with it. This information is useful for both pharmaceutics and pharmaceutical engineering.

PO4: Entrepreneurship: Categorize and evaluate pharmaceutical dosage forms are imparted on students. This knowledge comes while handling a Pharmacy or a Manufacturing unit or in the further courses.

PO5: Design/Development: Design and development of various dosage forms and quality control.

PO6: Application oriented Knowledge: Produce the knowledge of biopharmaceutics enables the students to visualize the effect of pharmacokinetic (ADMET) parameters on the biological effect of the drug. The correlation of pharmacokinetics and pharmacodynamics is thus introduced and is experimentally explained to them.

PO7: Environment and Sustainability: Demonstrate the extension of pharmaceutical dosage forms, and enables the students to learn about different packaging materials used in pharmaceutical industry and the factors governing their use.

PO8: Conduct investigations of complex problems: Understand biopharmaceutical principles and pharmacokinetic principles through different compartment models, multiple dosage regimens, non-linear pharmacokinetics, and assessment of bioavailability and bioequivalence

PO9. Effective Citizenship: Demonstrate empathetic social concern and equity centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

PO10. Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

PO11. Self-directed and Life-long Learning: Establish the ability to engage in independent and life-long learning in the broadest context socio-technological changes.

M PHARM PHARMACEUTICAL CHEMISTRY

PO1: Apply the knowledge of pharmaceutical chemistry and its application in the field of process chemistry as well as drug discovery.

PO2: Analyse unknown organic compound for its structure after its identification and characterisation by various analytical instrumental methods.

PO3: Apply different techniques in the field of medicinal chemistry for rational drug design.

PO4: Describe general methods for the isolation, purification and characterisation of medicinal compounds from natural origin.

PO5: Design of various hyphenated analytical instrumental techniques for identification, characterization and quantification of drugs.

PO6: Examine the different techniques of organic synthesis and enumerate various advances in organic chemistry.

PO7: Explain current state of the techniques involved in computer assisted drug design.

PO8: Compare the financial aspects involved in the synthesis of drugs and adoption of economic strategy towards new drug development.

PO9: Develop green methods for research and manufacture pertaining to drugs to encourage environmentally sustainable research.

PO10: Apply ethical strategy towards the design of new lead molecules in the research and development process.

PO11: Importance of medical chemistry in the synthesis of new drug molecules which are safe and efficacious to the public.

PO12: Apply the knowledge attained through study of the programme in the broad context of new drug discovery process with passion to acquire more knowledge in future.

PHARM D

PO1: LIFE SCIENCES KNOWLEDGE: Impart fundamental knowledge of Physiology, Anatomy, Formulation science, Applied biochemistry, Chemistry of Organic and Inorganic compounds as per the monographs and scientific foundations of health care professionals.

PO2: PATHOLOGY AND PHARMACOLOGY KNOWLEDGE: Impart a thorough knowledge of relevant aspects of pathophysiological mechanisms, application of microbiology in pharmacy field, medicinal uses of natural drugs and Pharmacological aspects of drugs.

PO3: COMMUNITY PHARMACY KNOWLEDGE: To improve skills involved in dispensing of drugs, ensuring safe medication usage, patient counseling and improving patient care in community pharmacy set up.

PO4: CLINICAL PHARMACIST KNOWLEDGE: To enhance the outcome of practical clinical discussions, attending ward rounds, follow-up progress of patients, case presentation after patient discharge during hospital postings.

PO5: ENVIRONMENT AND SUSTAINABILITY: To understand the instrumental techniques applied in Good Laboratory Practice, following ICH-GCP guidelines, total quality management, quality review and documentation, study of regulatory bodies, pharmaceutical legislations, CDSCO guidelines in line with environmental protection and sustainable pharmaceutical development.

PO6: DESIGN/DEVELOPMENT: To study the modern concept of rational drug design such as Quantitative Structure Activity Relationship, Computer Aided Drug Design and concept of antisense molecules.

PO7: CONDUCT INVESTIGATIONS OF COMPLEX PROBLEMS: To understand biopharmaceutical principles and pharmacokinetic principles through different compartment models, multiple dosage regimens, non-linear pharmacokinetics and assessment of bioavailability and bioequivalence parameters.

PO8: TOXICOLOGY KNOWLEDGE: To understand the toxicological aspects of radiation heavy metals, plant products, food poisoning cases, snake bites, and xenobiotics such as pesticides, opiates, NSAIDs and envenomation process.

PO9: ETHICS: To understand the clinical aspects of drug development such as various phases of clinical trial, ethical issues, roles and responsibilities of clinical trial personnel, design of clinical study documents, data management and safety monitoring in clinical trials.

PO10: ECONOMY- Illustrate pharmacoeconomic principles for receiving better quality healthcare at reduced costs, to analyze basic principles of health care finance, evaluating cost-effectiveness and cost benefit of medication use.

PO11: THE CLINICAL PHARMACIST AND SOCIETY – Participation in hospital camps, disease awareness programs which will inculcate social responsibility trait in clinical pharmacists and practice of safer dosage adjustment in special population and safe administration of narrow therapeutic index drugs.

PO12: LIFE-LONG LEARNING - Design of clinical study documents, data management, safety monitoring in clinical trials, analysis, monitoring and reporting of potential Drug- Drug interactions and Adverse Drug Events to competent authority and understand the clinical aspects of drug development,