PUNE DISTRICT EDUCATION ASSOCIATION'S
SETH GOVIND RAGHUNATH SABLE COLLEGE OF PHARMACY
SASWAD, DIST. PUNE

PROGRAM OUTCOMES

B. PHARM./ M. PHARM.

1. **Pharmacy Knowledge**: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; andmanufacturing practices.
2. **Planning Abilities:** Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
3. **Problem analysis:** Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.
4. **Modern tool usage**: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of thelimitations.
5. **Leadership skills:** Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsiblecitizens or leadership roles when appropriate to facilitate improvement in health and well-being.
6. **Professional Identity**: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
7. **Pharmaceutical Ethics**: Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
8. **Communication:** Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
9. **The Pharmacist and society**: Apply reasoning informed by the contextual knowledge toassess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
10. **Environment and sustainability**: Understand the impact of the professional pharmacysolutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
11. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self-assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

PROGRAMME SPECIFIC OUTCOMES (B. PHARM.)

PSO1: To pursue excellence in pharmaceutical education.

PSO2: To contribute significantly towards quality research in the field of pharmacy.

PSO3: To make pharmaceutical education more relevant with contemporary needs in order to keeppace with the knowledge and information explosion.

PSO4: To enhance students employability skills.

PSO5: To develop a professionally competent, ethically sound and skilled pharmacist

PROGRAMME SPECIFIC OUTCOMES (M. PHARM.)

PSO1: Apply skills to do specialized research in the core and applied areas of pharmaceutical sciences.

PSO2: Interpret data of pharmaceutical research in drug discovery as per the needs of pharmaceutical industries.

PSO3: Develop an ability to visualize and work on multidisciplinary tasks in the areas of pharmaceuticals and its allied field.

PSO4: Analyze, criticize, organize, improvise and manage documents, data and information related to pharmaceutical drug development process.

PSO 5: To create a talent pool by involving students in research projects and to make students undertake research projects under faculty guidance for publication and to foster ambitious desire among students to undertake higher studies and career growth.

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Course Outcome - [B Pharmacy]

Semester I

Communication skills [Theory | Regular]

CO ID.	Course Outcome
CO1	Employ effective communication techniques including verbal and nonverbal communication
CO2	To acquaint and familiarize the students with soft skills to present ideas effectively and efficiently.
CO3	To equip the students with social skills with an emphasis on active learning.
CO4	To revise and reinforce the learning of soft skills to enhance employability skills and Interpersonal skills.
CO5	To build self-confidence and enhance leadership qualities with stress management and Time management skills

Remedial Biology [Theory | Elective]

CO ID.	Course Outcome
CO 1	Explain about the kingdom living organisms and salient features
CO 2	Explain about the morphology and general anatomy of the flowering plants
CO 3	Describe the concepts of plant and mineral nutrition
CO 4	Explain the plant tissues, respiration and photosynthesis
CO 5	Describe the digestive, respiratory, excretory and reproductive systems of humans

Communication skills [Practical | Regular]

CO ID.	Course Outcome
CO1	To develop Linguistic Competence and enhance the skill of using English for day to day communication.
CO2	To familiarize the students with various components of Language.
CO5	To acquire Language skills and to develop competence in using English Language.
CO3	To develop interest among the students to interact in English for exposure of speaking English.
CO4	To acquire grammatical knowledge and to develop skills around human communication.
CO6	To enhance communication skills and speaking skills with life skills and life values

BP101T Human Anatomy and Physiology-I [Theory | Regular]

CO ID.	Course Outcome
CO1	Explain the gross morphology, structure and functions of various organs of the human body.
CO2	Describe the various homeostatic mechanisms and their imbalances.
CO3	Identify the various tissues and organs of different systems of human body.
CO4	Perform the various experiments related to special senses and nervous system.
CO5	Appreciate coordinated working pattern of different organs of each system

BP103T Pharmaceutics-I [Theory | Regular]	
CO ID.	Course Outcome
co 1	Know the history of profession of pharmacy
co 2	Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations
co 3	Understand the professional way of handling the prescription
co 4	Preparation of various conventional dosage forms
BP104T Pharmaceutical Analysis I [Theory | Regular]	
CO ID.	Course Outcome
CO1	Explain the various methods of expressing concentration and requirement of primary standards & Describe the preparation and standardization of different reagents used in volumetric analysis
CO2	Carry out various volumetric and electrochemical titrations
CO3	Develop analytical skills.
CO4	Learning this subject content will develop the ideas with the fundamental of analytical chemistry among the pupil
CO5	Explain the principle of conductometry and potentiometry & Describe the principle of polarography and different electrodes used in polarography.
CO6	Describe the principle of complexometric and gravimetric estimation with examples.
BP104T Pharmaceutical Inorganic Chemistry [Theory | Regular]	
CO ID.	Course Outcome
CO1	Well-acquainted with the principles of limit tests
CO2	Familiar with different classes of inorganic pharmaceuticals and their analysis
CO3	Understand the medicinal and pharmaceutical importance of inorganic compounds
CO4	Knowledge about the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals
BP104T Pharmaceutical Analysis-I [Practical | Regular]	
CO ID.	Course Outcome
CO1	Explain the principle of acid base, nonaqueous and precipitation titration with examples
CO2	Carry out various volumetric and electrochemical titrations
CO3	Develop analytical skills.
CO4	Learning this subject content will develop the ideas with the fundamental of analytical chemistry among the pupil
CO5	Explain the principle of conductometry and potentiometry & Describe the principle of polarography and different electrodes used in polarography.
CO6	Describe the principle of complexometric and gravimetric estimation with examples.
BP106 Remedial Mathematics [Theory | Elective]	
CO ID.	Course Outcome
CO1	Apply mathematical concepts and principles to perform computations for Pharmaceutical Sciences.
CO2	Create, use and analyze mathematical representations and mathematical relationships.
CO3	Communicate mathematical knowledge and understanding to help in the field of Clinical Pharmacy.
CO4	Perform abstract mathematical reasoning.

BP107P Human Anatomy and Physiology-I [Practical | Regular]

CO ID.	Course Outcome
CO1	To recall handling of compound microscope and to memorize various animal tissue
CO2	To summarize the characteristics of different types of tissues and their location in various organs
CO3	To organize the structure and functions of skin, bones and joints of human body
CO4	To analyze the importance of blood, lymphatic system and immunity in human body.
CO5	To adapt the anatomy and physiology of heart and blood vessels.

BP109P Pharmaceutics-I [Practical | Regular]

CO ID.	Course Outcome
CO 1	Understand formulation and evaluation of Pharmaceutical solution
CO 2	Understand formulation and evaluation of Pharmaceutical dispersed system
CO 3	Understand formulation and evaluation of pharmaceutical powders
CO 4	Understand formulation and evaluation of semisolid dosage form

BP110P Pharmaceutical Inorganic Chemistry [Practical | Regular]

CO ID.	Course Outcome
CO1	Know the source of impurities and determine the impurities in in organic compound.
CO2	Know the identification test foe few organic compound.
CO3	To test the impurities of few organic compound.
CO4	To know the preparation of inorganic pharmaceuticals.

Semester III

BP 307 P Pharmaceutical Microbiology [Practical | Regular]

CO ID.	Course Outcome
CO1	To recall different techniques of sterilization.
CO2	To demonstrate various staining methods - simple, gram staining and acid fast staining
CO3	To interpret the results of microbial testing.
CO4	To demonstrate Staining methods and culture methods
CO5	Microbiological assay of antibiotics
CO6	To demonstrate the sterility testing
CO7	To demonstrate the bacteriological analysis of water
CO8	To demonstrate biochemical test

BP301T Pharmaceutical Organic Chemistry-II [Theory | Regular]

CO ID.	Course Outcome
CO1	Understand various molecular representations and their interconversions.
CO2	Write the structure, name the reaction and the type of isomerism of the organic compound.
CO3	Account for reactivity/stability of compounds
CO4	Write the reaction, name the reaction, mechanism and orientation of reactions

CO5	Prepare small organic compounds

BP302T Physical Pharmaceutics-I [Theory | Regular]

CO ID.	Course Outcome
CO1	Understand the mechanisms of solute solvent interactions
CO2	Study the limitations and applications of Distribution law
CO3	Learn the steps involved in the preparation of pharmaceutical buffers and its importance
CO4	Study the use of physicochemical properties in formulation research and development
CO5	Acquire skills and working knowledge of the principles and concepts of surface tension and its measurement

BP303T Pharmaceutical Microbiology [Theory | Regular]

CO ID.	Course Outcome
CO1	Understand methods of identification, cultivation and preservation of various microorganisms
CO2	To understand the importance and implementation of sterilization in pharmaceutical processing and industry
CO3	Learn sterility testing of pharmaceutical products.
CO4	Carried out microbiological standardization of Pharmaceuticals.
CO5	Understand the cell culture technology and its applications in pharmaceutical industries.

BP304T Pharmaceutical Engineering [Theory | Regular]

CO ID.	Course Outcome
CO 1	To know various unit operations used in Pharmaceutical industries.
CO2	To understand the material handling techniques.
CO3	To perform various processes involved in pharmaceutical manufacturing process.
CO4	To carry out various test to prevent environmental pollution
CO5	To appreciate and comprehend significance of plant lay out design for optimum use of resources.
CO6	To appreciate the various preventive methods used for corrosion control in Pharmaceutical industries.

BP305P Pharmaceutical Organic Chemistry-II [Practical | Regular]

CO ID.	Course Outcome
CO1	Know different simple laboratory techniques for purification of organic compounds
CO2	Identify the mixture of organic compounds
CO3	Synthesize different organic compounds and know reaction & Mechanism
CO4	Communicate effectively the observations and results of an experiment

BP306P Physical Pharmaceutics-I [Practical | Regular]

CO ID.	Course Outcome
CO1	To understand the significance of physical properties such as solubility, surface tension, partition coefficient and pKa in the design of dosage forms.
CO2	To explain adsorption isotherms and determine Freundlich-Langmuir constant using activated charcoal.
CO3	To apply Henderson Hasselbalch equation for interpretation of pKa value of drugs
CO4	To determine the surface tension of sample liquids by drop count and drop weight methods

CO5	To deduce the HLB value and critical micellar concentration of a surfactant.
CO6	To estimate the stability constants of complexes by solubility and pH titration methods.

BP308P Pharmaceutical Engineering [Practical | Regular]

CO ID.	Course Outcome
CO1	To understand the basic principles involved in unit operations such as size reduction, size separation, distillation and drying.
CO2	To demonstrate and explain about the construction, working and applications of pharmaceutical equipments such as colloid mill, planetary mixer, fluidized bed dryer and freeze dryer.
CO3	To experiment with the process variables of filtration, evaporation and infer the same.
CO4	To determine radiation constant of brass, iron, unpainted and painted glass.
CO5	To determine overall heat transfer coefficient by heat exchanger and calculate the efficiency of steam distillation.
CO6	To estimate moisture content, loss on drying and construct drying curves for calcium carbonate and starch.
CO 1	To know various unit operations used in Pharmaceutical industries.
CO 2	To understand the material handling techniques.
CO 3	To perform various processes involved in pharmaceutical manufacturing process.
CO 4	To appreciate the various preventive methods used for corrosion control in Pharmaceutical industries

Semester V

BP 503 T Pharmacology-II [Theory | Regular]

CO ID.	Course Outcome
CO1	Understand the mechanism of drug action and its relevance in the treatment of different diseases
CO2	Appreciate correlation of pharmacology with related medical sciences

BP 508 P Pharmacognosy and Phytochemistry-II [Practical | Regular]

CO ID.	Course Outcome
CO1	Explain source, chemistry, therapeutic uses of various secondary metabolites containing drugs
CO2	Describe methods of extraction, analysis and commercial application of various secondary metabolites containing drugs.
CO3	Describe various modern methods for extraction
CO4	Application of latest techniques for analysis of phytoconstituents
CO5	Explain the process of isolation, purification and identification of crude drugs

BP501T Medicinal Chemistry-II [Theory | Regular]

CO ID.	Course Outcome
CO2	Explain drug metabolism & its significance in drug discovery
CO1	State the history of development of different classes of CNS, CVS active drugs, drug acting on endocrine system, and Antidiabetic agent
CO3	Classification of various categories of therapeutic agents according to their chemical structure and mechanism of action
CO4	Recall the mechanism of action of drugs, side effects, therapeutic uses and adverse effects
CO5	Explain the chemistry and structure activity relationship of therapeutic classes of drugs and recent developments

BP502T Industrial Pharmacy-I [Theory | Regular]	
CO ID.	Course Outcome
CO1	Carry out assessment of physicochemical properties of drugs as a tool in the optimization of solid and liquid dosage forms.
CO2	Formulate and prepare tablets, capsules and liquid orals using established procedures and technology.
CO3	Describe the facilities and standards necessary for the industrial production of sterile dosage forms.
CO4	Formulate and prepare different types of parenteral and ophthalmic dosage forms
CO5	Evaluate the pharmaceutical dosage forms for quality and stability and compare with standards prescribed in the pharmacopoeia
CO6	Select ingredients and formulate cosmetics such as lipsticks, shampoos, cold cream and vanishing cream, tooth pastes, hair dyes and sunscreens
CO7	Identify containers, closures, valves and propellants for different types of aerosol systems.
CO8	Select and evaluate appropriate packaging materials for various pharmaceutical dosage forms.
BP504 T Pharmacognosy and Phytochemistry-II [Theory | Regular]	
CO ID.	Course Outcome
CO1	To know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents
CO2	To understand the production of Phytoconstituents /herbal formulation.
CO3	To understand the metabolic pathways in formation of secondary metabolites and application of biogenetic studies
CO4	To carryout isolation and identification of phytoconstituents
BP505T Pharmaceutical Jurisprudence [Theory | Regular]	
CO ID.	Course Outcome
CO1	Understand the history of Pharmaceutical legislation and conduct of the code of ethics regarding the pharmacy profession in India
CO2	Study Pharmacy Act, Medicinal and Toilet Preparation Act, Narcotics and Psychotropic Substances Act, Features of Drugs and Magic Remedies Act, and Medical Termination of Pregnancy Act
CO3	Study Prevention of Cruelty to animals Act, National Pharmaceutical Pricing Authority and Right to Information Act.
CO4	Study of Introduction to Intellectual Property Rights (IPR).
BP506P Industrial Pharmacy-I [Practical | Regular]	
CO ID.	Course Outcome
CO1	Important of reformulation of drug in formulation of dosage form.
CO2	Knowledge of preparation of tablet and liquid dosage forms and evaluation of formulation.
CO3	Knowledge on preparation and evaluations of capsules.
CO4	Knowledge on sterile product preparation and there evaluation
CO5	Knowledge on formulations of cosmetics, and packaging material science.
BP507P Pharmacology-II [Practical | Regular]	
CO ID.	Course Outcome
CO1	To learn the importance of physiological salt solutions and to identify the effect of various drugs on isolated frog heart, blood pressure and heart rate of dog.
CO2	To illustrate the diuretic activity of drugs in mice/rats
CO3	To identify the dose response relationship, effect of drugs on DRC and to construct the drug concentrations by various bioassay methods using animal simulator software.

CO4	To categorize the PA2 and PD2 value of drugs using rat anococcygeus muscle and guinea pig ileum.
CO5	To interpret the effect of spasmogens and spasmolytics using rabbit jejunum.
CO6	To predict various screening models for analgesic and anti-inflammatory.

BP 703 Tated Pharmacy Practice [Theory | Regular]

CO ID.	Course Outcome
CO1	Know various drug distribution methods in a hospital
CO2	Appreciate the pharmacy stores management and inventory control
CO3	Monitor drug therapy of patient through medication chart review and clinical review, Identify drug related problems and Detect and assess adverse drug reactions
CO4	Obtain medication history interview and counsel the patients, Know pharmaceutical care services, Do patient counseling in community pharmacy, Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states and Appreciate the concept of rational drug therapy.

BP 704 T Novel Drug Delivery System [Theory | Regular]

CO ID.	Course Outcome
CO 1	To understand various approaches for development of novel drug delivery systems.
CO 2	To understand the criteria for selection of drugs and polymers for the development of Novel drug delivery systems, their formulation and evaluation.

BP701T Instrumental Methods of Analysis [Theory | Regular]

CO ID.	Course Outcome
CO1	Illustrate the interaction of matter with electromagnetic radiations
CO2	Classify the chromatographic separation methods
CO3	Design methods for performing quantitative & qualitative analysis of drugs using various analytical instruments.

BP702T Industrial Pharmacy-II [Theory | Regular]

CO ID.	Course Outcome
CO1	Discuss the process of pilot plant scale up of pharmaceutical dosage forms.
CO2	Demonstrate the practice and the process of technology transfer from lab scale to commercial.
CO3	Explain the different laws and acts that regulate pharmaceutical industry.
CO4	Describe the approval process and regulatory requirements of drug products.

BP705P Instrumental Methods of Analysis [Practical | Regular]

CO ID.	Course Outcome
CO1	Explain the different types of instrumental analytical techniques available for quality control of APIs & formulations
CO2	Explain the different types of chromatographic techniques available for quality control of APIs & formulations
co3	Interpret the data obtained through experimentation and report the results as per regulatory requirements.

Semester II

BP 206 T Environmental sciences [Theory | Regular]

CO ID.	Course Outcome
CO1	Know basics of environment like ecology, ecosystem, food chain, food web and ecological pyramids
CO2	Know the different natural sources and their conservation to save the environment
CO3	Know the current problems of environment and how to solve them.
CO4	Aware about hazards of disposal wastes from hospitals and pharmaceutical industries & role of individual in conservation of natural resources

BP201 T Human Anatomy and Physiology-II [Theory | Regular]

CO ID.	Course Outcome
CO1	Explain the gross morphology, structure and functions of various organs of the human body
CO2	Describe the various homeostatic mechanisms and their imbalances.
CO3	Identify the various tissues and organs of different systems of human body.
CO4	Perform the hematological tests like blood cell counts, hemoglobin estimation, bleeding/clotting time etc. and also record blood pressure, heart rate, pulse and respiratory volume.
CO5	Appreciate coordinated working pattern of different organs of each system
CO6	Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body.

BP202T Pharmaceutical Organic Chemistry-I [Theory | Regular]

CO ID.	Course Outcome
CO1	Understand fundamental concepts of organic chemistry
CO2	Apply IUPAC nomenclature in naming organic compounds and write structure
CO3	Write the reaction, name the reaction, mechanism and orientation of reactions and type of isomerism of the organic compound.
CO4	Account for reactivity/stability of compounds
CO5	Identify/confirm the identification of organic compounds

BP203 T Biochemistry [Theory | Regular]

CO ID.	Course Outcome
CO1	Understand the catalytic role of enzymes and importance of enzyme in biochemical process.
CO2	Understand the metabolism of nutrient molecules in physiological and pathological conditions.
CO3	Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.
CO4	To discuss the metabolism of nucleic acids, lipids and amino acids
CO5	Explain the concept of free energy and energy rich compound

BP204T Pathophysiology [Theory | Regular]

CO ID.	Course Outcome
CO1	Describe Basic principles of Cell injury Adaptation and explain the concept of inflammation and repair

CO2	Describe the etiology and pathogenesis of various disorders pertaining to CVS, respiratory and renal system
CO3	classification, etiology and pathogenesis of cancer pertaining to Hematological, endocrine ,GI and nervous system
CO4	Classify and explain the etiology and pathogenesis of cancer.
CO5	Describe the etiology and pathogenesis of disorders related to bones and joints
CO6	Describe the etiology and pathogenesis of Meningitis, Typhoid, Leprosy, Tuberculosis
CO7	Describe the etiology and pathogenesis of UTI
CO8	Describe the etiology and pathogenesis of AIDS, Syphilis, and Gonorrhea.

BP205P Computer Applications in Pharmacy [Practical | Regular]

CO ID.	Course Outcome
CO1	Design a questionnaire using a word processing package to gather information about a particular disease.
CO2	Create a HTML web page to show personal information.
CO3	Retrieve the information of a drug and its adverse effects using online tools
CO4	Creating mailing labels Using Label Wizard , generating label in MS WORD
CO5	Create a database in MS Access to store the patient information with the required fields Using MS access and Design a form in MS Access to view, add, delete and modify the patient record in the database
CO6	Generating report and printing the report from patient database and Creating invoice table using – MS Access
CO7	Drug information storage and retrieval using MS Access AND Creating and working with queries in MS Access
CO8	Exporting Tables, Queries, Forms and Reports to web pages and Exporting Tables, Queries, Forms and Reports to XML pages

BP205T Computer Applications in Pharmacy [Theory | Regular]

CO ID.	Course Outcome
CO1	Explain the applications of computer in Pharmacy.
CO2	Analyse the different types of databases.
CO3	Create data bases using MS Access, SQL.
CO4	Explain bioinformatics and their impact in vaccine discovery
CO5	Identify the role of computers for data analysis in the field of preclinical development

BP207P Human Anatomy and Physiology-II [Practical | Regular]

CO ID.	Course Outcome
CO1	To recall the physiology of special senses with the help of models, charts and specimens.
CO2	To develop the knowledge on coordinating working of organs of various systems with the help of models, charts and specimens
CO3	To analyze the functions of cranial nerves by various sensory and motor functions.
CO4	To evaluate body temperature and body mass index.
CO5	To determine tidal volume and vital capacity
CO6	To assess the knowledge on family planning devices, pregnancy diagnostic tests, tissues of vital organs and gonads.

BP208P Pharmaceutical Organic Chemistry-I [Practical | Regular]

CO ID.	Course Outcome
CO1	Perform correct use of various equipments & Safety measures in Pharmaceutical Chemistry laboratory.

CO2	Know different simple laboratory techniques for characterization and purification of organic compounds.

CO3	Identify/confirm the identification of organic compounds.
CO4	Synthesize different organic compounds and know reaction & Mechanism.
CO5	Communicate effectively the observations and results of an experiment.

BP209P Biochemistry [Practical | Regular]

CO ID.	Course Outcome
CO1	Describe Qualitative analysis of Carbohydrate
CO2	Identification tests for amino acids & proteins
CO3	Qualitative analysis of urine for abnormal constituents & determination of Blood sample, Blood creatinine
CO4	Determination of serum total cholesterol.
CO5	Preparation of buffer solution and measurement of pH
CO6	Determination of salivary amylase activity Study the effect of temperature & effect of substrate concentration on salivary amylase activity.

Semester IV

407P Physical Pharmaceutics-II [Practical | Regular]

CO ID.	Course Outcome
CO1	It deals with the various physical and physicochemical properties, and principles involved in dosage forms/formulations
CO2	To interpret the shelf life of a given formulation by accelerated stability studies.
CO3	To make use of derived and flow properties of powders to ensure a stable solid formulation.

BP402T Medicinal Chemistry-I [Theory | Regular]

CO ID.	Course Outcome
CO1	Understand the chemistry of drugs with respect to their pharmacological activity.
CO2	Understand the drug metabolic pathways, adverse effect and therapeutic value of Drugs.
CO3	Know the Structural Activity Relationship (SAR) of different class of drugs.
CO4	Write the chemical synthesis of some drugs.

BP403T Physical Pharmaceutics-II [Theory | Regular]

CO ID.	Course Outcome
CO1	Understand various physicochemical properties of drug molecules in the designing the dosage forms
CO2	Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
CO3	Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.

BP404T Pharmacology-I [Theory | Regular]

CO ID.	Course Outcome
CO1	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
CO2	Observe the effects of drugs on animal by simulated experiments.
CO3	Appreciate correlation of pharmacology with other bio medical sciences.
CO4	Understand the pharmacological actions of different categories of drugs.
CO5	Explain the mechanism of action at organ system/sub cellular/macromolecular levels

BP405T Pharmacognosy and Phytochemistry-I [Theory | Regular]

CO ID.	Course Outcome
CO1	To know the techniques in the cultivation and production of crude drugs
CO2	To know the crude drugs, their uses and chemical nature
CO3	To know the evaluation techniques for the herbal drugs
CO4	To carry out the microscopic and morphological evaluation of crude drugs

BP406P Medicinal Chemistry-I [Practical | Regular]

CO ID.	Course Outcome
CO1	Upon completion of the course students shall be able to Synthesize, recrystallize organic compounds.
CO2	To understand reaction mechanism involved in synthesis of medicinally important organic compounds.
CO3	Know different purification methods of organic compounds.
CO4	To know partition coefficient of organic compounds.
CO5	Communicate effectively the observations and results of an experiments.

BP408P Pharmacognosy and Phytochemistry-I [Practical | Regular]

CO ID.	Course Outcome
CO1	Able to understand morphology, microscopy and powder characteristics of crude drugs
CO2	Able to identify unorganized drugs by chemical methods
CO3	Able to determine the quality of unorganized crude drugs
CO4	Able to conduct extraction and estimation of different phytoconstituents.

BP408P Pharmacology-I [Practical | Regular]

CO ID.	Course Outcome
CO1	To learn about basic instruments, common laboratory animals used in experimental pharmacology and to organize animal house as per the CPCSEA guidelines.
CO2	To demonstrate the common laboratory techniques like routes of administration , blood withdrawal, anesthetics and euthanasia used for animal studies
CO3	To interpret the effects of various drugs on rabbit eye and ciliary motility of frog oesophagus in correlation with humans
CO4	To analyze the effect of drugs acting as enzyme inducers, skeletal muscle relaxants and affecting locomotor activity in laboratory animals
CO5	To evaluate the stereotype and anticatatonic activity of drugs in rats/mice

BPH401T Pharmaceutical Organic Chemistry-III [Theory | Regular]

CO ID.	Course Outcome
CO1	Know the structures with numbering of heterocyclic compounds, chemistry, methods of preparation and chemical reactions of five, six membered and fused heterocyclic rings.
CO2	Understand the methods of preparation and properties of organic compounds.
CO3	Explain the stereochemical aspects of organic compounds and stereo chemical reactions.
CO4	Know the medicinal uses and other applications of organic compounds.

Semester VI

Herbal Drug Technology [Theory | Regular]

CO ID.	Course Outcome
CO 1	To understand raw material as source of herbal drugs from cultivation to herbal drug product
CO 2	To know the WHO and ICH guidelines for evaluation of herbal drugs
CO 3	To know the herbal cosmetics, natural sweeteners, nutraceuticals
CO 4	To understand patenting of herbal drugs, GMP.

BP 602 T Pharmacology-III [Theory | Regular]

CO ID.	Course Outcome
CO1	To understand the mechanism of drug action and its relevance in the treatment of different infectious diseases
CO2	To understand the comprehend the principles of toxicology and treatment of various poisonings and appreciate correlation of pharmacology with related medical sciences.

BP 604 T Biopharmaceutics and Pharmacokinetics [Theory | Regular]

CO ID.	Course Outcome
CO 1	The basic concepts in bio pharmaceutics and pharmacokinetics.
CO 2	The critical evaluation of biopharmaceutic studies involving drug product equivalency
CO 3	Understand the concept of dissolution and application of in vitro in vivo correlation in drug product development.

BP 608 P Pharmacology-III [Practical | Regular]

CO ID.	Course Outcome
CO1	To get a basic principles of bioassay, types of bioassay along with advantages and disadvantages and evaluation of various drugs by using in vivo & invitro models with computer simulated methods.
CO2	To study various routes of drug administration & sampling techniques. and know the effect of drugs on frog heart, blood pressure by computer simulation.
CO3	To get a knowledge of the various newer screening methods involved in the drug discovery process as well as various animals used in the drug discovery process.
CO4	students will able to apply proper biostatical method for data interpretation and calculation

BP601T Medicinal Chemistry-III [Theory | Regular]

CO ID.	Course Outcome
CO 1	The students should be able to understand the importance of drug design and different techniques of drug design and history of drug development
CO2	Know the metabolism, adverse effects and therapeutic value of drugs.
CO3	understand the chemistry and SAR of drug
CO4	Understand the concept of quantitative structure activity relationship (QSAR) in drug design
CO5	Understand the mechanism of action of drugs

BP605T Pharmaceutical Biotechnology [Theory | Regular]

CO ID.	Course Outcome
CO1	Acquire knowledge in basic principles of genetic engineering and enzyme technology
CO2	Apply the principles of biosensors and protein engineering in Pharmaceutical Industry
CO3	Explain the concepts of rDNA technology and its applications

CO4	Describe the concept of immunity and production of vaccine

CO5	Define hybridoma technology and understand hypersensitivity reaction
CO6	Knowledge on genetic multiplication and biotransformation
CO7	Discuss the principles of fermentation its design and production of pharmaceutical products.
CO8	Describe various blood products, plasma collection and processing of it.

BP606T Quality Assurance [Theory | Regular]

CO ID.	Course Outcome
CO1	Understand the cGMP aspects in a pharmaceutical industry
CO2	Appreciate the importance of documentation
CO3	Understand the scope of quality certifications applicable to pharmaceutical industries
CO4	Understand the responsibilities of QA & QC departments

BP607P Medicinal chemistry-III [Practical | Regular]

CO ID.	Course Outcome
CO1	Upon completion of the course students shall be able to Synthesize, recrystallize and understand reaction mechanisms involved in synthesis of medicinally important organic compounds.
CO2	Use microwave in synthesis of medicinal chemistry.
CO3	Draw chemical structures using software
CO4	Determine physicochemical properties of drugs using software
CO5	Communicate effectively the observations and results of an experiment

BP609P Herbal Drug Technology [Practical | Regular]

CO ID.	Course Outcome
CO1	To remember different preliminary phytochemical screening of crude drugs
CO2	To evaluate the various herbal formulations
CO3	To apply monographic analysis of herbal drugs as per pharmacopoeias
CO4	To evaluate parameters such as aldehyde and phenol contents
CO5	To assess the total alkaloid content

Semester VIII

BP801T Biostatistics and Research Methodology [Theory | Regular]

CO ID.	Course Outcome
CO 1	Know the various statistical methods to solve different types of problems
CO 2	Operate various statistical software packages
CO 3	Appreciate the importance of Computer in hospital and Community Pharmacy
CO 4	Appreciate the statistical technique in solving the pharmaceutical problems

BP802T Social and Preventive Pharmacy [Theory | Regular]

CO ID.	Course Outcome
CO1	Acquire high consciousness of current issues related to health and Pharmaceutical problems within the country and worldwide.

CO2	Develop a critical way of thinking based on current health care development.
CO3	Evaluate alternative ways of solving problems related to health and pharmaceutical issues

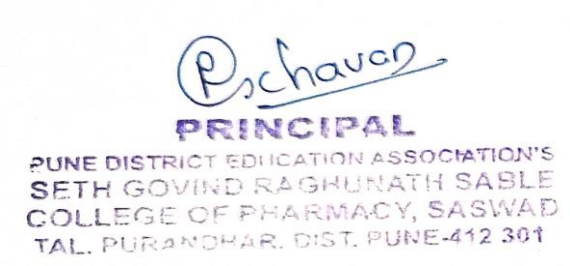
BP809ET Cosmetic Science [Theory | Regular]	
CO ID.	Course Outcome
CO1	Understand the concepts of cosmetics; anatomy of skin v/s hair, general excipients used in cosmetics
CO2	Explain the concept of cosmeceuticals, history, difference between cosmetics & cosmeceuticals & cosmeceuticals agents
CO3	Know different herbs used in cosmetics
CO4	Understand the cosmetics evaluation
CO5	Explain cosmetic problems of different body parts
BP811ET Advanced Instrumentation Techniques [Theory | Regular]	
CO ID.	Course Outcome
CO1	Explain the principle of the advanced instrumental analysis
CO2	Explain the instrumentation of analytical techniques
CO3	Explain the importance techniques and methods for the calibration of various analytical instruments
CO4	Explain techniques for the analysis of drugs using various analytical instruments.

PRINCIPAL
PUNE DISTRICT EDUCATION ASSOCIATION'S
SETH GOVIND RAGHUNATH SABLE
COLLEGE OF PHARMACY, SASWAD
TAL. PURANDHAR. DIST. PUNE-412 301

Course Outcome - [M Pharm (Pharmaceutical Chemistry)]

Semester II	
MPC 201T Advanced Spectral Analysis [Theory | Regular]	
CO ID.	Course Outcome
CO1	The students should be able to Understand various hyphenated analytical instrumental techniques for identification, characterization and quantification of drugs (UV, IR, NMR, Mass spectrometry, thermal and chromatographic techniques)
CO2	Understand the instrumentation, theoretical and practical skills of instrument handling and its use
CO3	Interpret the NMR, Mass and IR spectra of various organic compounds
CO4	To elucidate the structure of organic compounds using this spectroscopic tools
MPC105P Pharmaceutical Chemistry Practical-II [Practical | Regular]	
CO ID.	Course Outcome
CO1	To understand various approaches of synthesis of API
CO2	To interpret IR, NMR, and mass spectrum of organic compounds
CO3	To identify the organic compounds by IR, NMR and Mass analysis
CO4	To prepare different compounds by synthetic route
CO5	To perform computer aided drug design software based practicals
MPC202T Advanced Organic Chemistry-II [Theory | Regular]	
CO ID.	Course Outcome
CO1	Explain the principles and Applications of Green Chemistry
CO2	Explain the concept of peptide chemistry.
CO3	Explain the various catalysts used in organic reactions
CO4	Explain the concept of stereochemistry and asymmetric synthesis.
MPC203T Computer Aided Drug Design [Theory | Regular]	
CO ID.	Course Outcome
CO1	Acquired expertise to utilize molecular modeling software in the design of novel drug-like molecules.
CO2	Can apply various strategies to design &develop new drug like molecules using CADD and QSAR methods.
CO3	Able to understand various strategies to design and develop new drug like molecules.
CO4	Capable of carrying out molecular modeling and molecular docking studies.
CO5	Possess knowledge of in silico virtual screening protocols.
MPC204T Pharmaceutical Process Chemistry [Theory | Regular]	
CO ID.	Course Outcome
CO1	To develop synthetic routes that is safe, cost-effective, environmentally friendly, and efficient.
CO2	To impart knowledge on the development and optimization of a synthetic route/s.

CO3	The pilot plant procedure for the manufacture of Active Pharmaceutical Ingredients and new chemical entities for the drug development phase.
CO4	□ To create and carry out work up and separation procedure and to predict the outcome of organic reactions using a basic understanding of the general reactivity of functional groups and mechanism.
CO5	The principles and applications of modern chemical instrumentation, experimental design, and data analysis.



Course Outcome - [M Pharm (Pharmaceutical Chemistry)]

Semester I

Advanced Medicinal Chemistry [Theory | Regular]

CO ID.	Course Outcome
C01	The student would be in position to design a stereoselective synthesis of new chemical entities (NCE) for the treatment of different diseases in new drug discovery Program.
CO2	The student would be in a position to have detailed knowledge of computer aided drug design which is useful to involve in new drug discovery Program by the utilization of natural leads and also with the help of structure-based drug design
CO3	The student would be in a position to explore the natural lead compounds for the treatment of different diseases like cancer, malaria, diabetes etc.
CO4	The appreciable knowledge will be gained by the students in the Modern Analytical Techniques and can apply the theories in the Analysis of various bulk drugs and their formulations. The students will also be in a position to apply their knowledge in developing the new methods for the determination and validate the procedures.

101T Modern Pharmaceutical Analytical Techniques [Theory | Regular]

CO ID.	Course Outcome
CO1	Understand Analytical techniques for identification, Characterization and quantification of drugs
CO2	Know about theoretical and practical skills of instrument handling and its use
CO3	Understand structural Elucidation of organic compounds using data of spectroscopic tools such as UV, IR, NMR, Mass spectrometer, HPLC, GC.

101T Modern Pharmaceutical Analytical Techniques-1 [Theory | Elective]

CO ID.	Course Outcome
CO1	Understand Analytical techniques for identification, Characterization and quantification of drugs
CO2	Know about theoretical and practical skills of instrument handling and its use
CO3	Understand structural Elucidation of organic compounds using data of spectroscopic tools such as UV, IR, NMR, Mass spectrometer, HPLC, GC.

MPC 105P Pharmaceutical Chemistry Practical-I (Part-I and II) [Practical | Regular]

CO ID.	Course Outcome
CO3	To analyze and estimate the organic compounds and biological by spectroscopic, fluorimetry, flame photometry methods
CO4	To separate the impurities or mixtures of organic compounds by using column chromatographic, HPLC, and gas chromatography methods
CO 1	To synthesize and characterize medicinally important compounds
CO 2	To perform various named reactions synthesis

MPC102T Advanced Organic Chemistry-I [Theory | Regular]

CO ID.	Course Outcome
CO1	Upon completion of course, the students shall be able to explain the principles and applications of reterosynthesis
CO2	Explain the mechanism & applications of various named reactions.
CO3	Write the concept of disconnection to develop synthetic routes for small target molecule.

CO4	Know the various catalysts used in organic reactions.
CO5	Explain the chemistry of heterocyclic compounds

MPC104T Chemistry of Natural Products [Theory | Regular]

CO ID.	Course Outcome
CO1	Study different types of natural compounds and their chemistry and medicinal importance
CO2	Explain the importance of natural compounds as lead molecules for new drug discovery
CO3	Explain the concept of DNA & rDNA technology tool for new drug discovery
CO4	Isolation, Purification and characterization of simple chemical constituents from natural source

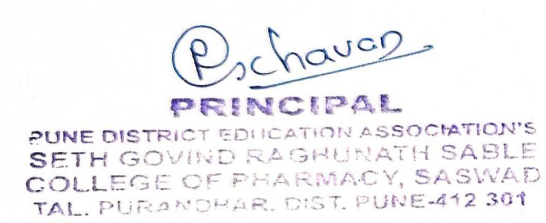
Semester III

Introduction to Constitution [Theory | Elective]

CO ID.	Course Outcome
CO1	To realise the significance of constitution of India to students from all walks of life and help them to understand the basic concepts of Indian constitution
CO2	To identify the importance of fundamental rights aswell as fundamental duties.
CO3	To understand the functioning of Union, State and Local Governments in Indian federal system.
CO4	To learn procedure and effects of emergency, composition and activities of election commission and amendment procedure.

MRM301T Research Methodology and Biostatistics [Theory | Regular]

CO ID.	Course Outcome
CO2	Describe the appropriate statistical methods required for a particular research design
CO1	Develop the ability to apply the methods while working on a research project work
CO3	Choose the appropriate research design and develop appropriate research hypothesis for a research project
CO4	Develop a appropriate framework for research studies



Course Outcome - [M Pharm (Pharmacology)]

Semester II

MPL 202 T Pharmacological and Toxicological Screening Methods-II [Theory | Regular]

CO ID.	Course Outcome
CO1	Students should able to explain the various types of toxicity studies.
CO2	Students should get a knowledge of importance of ethical and regulatory requirements for toxicity studies.
CO3	Students should get an idea of skills require conducting for preclinical toxicity studies

MPL 204 T Clinical Research and Pharmacovigilance [Theory | Regular]

CO ID.	Course Outcome
CO1	Explain the regulatory requirements for conducting clinical trial
CO2	Demonstrate the types of clinical trial designs
CO3	Explain the responsibilities of key players involved in clinical trials
CO4	Execute safety monitoring, reporting and close-out activities.
CO5	Explain the principles of Pharmacovigilance
CO6	Detect new adverse drug reaction and their assessment.
CO7	Perform the adverse drug reaction reporting systems and communication in Pharmacovigilance.

MPL 205 P Pharmacology Practical-II [Practical | Regular]

CO ID.	Course Outcome
CO1	Students should able to design and perform invitro pharmacological experiments using various isolated tissue preparation
CO2	Students should be able to quantitatively estimate the biological samples using isolated tissue preparation and interpret to calculate the PD2 and PA2 values
CO3	Students should able to understand the OECD guidelines and perform acute toxicity studies for safety evaluation and able to interpret the pharmacokinetic profile of the given drug
CO4	Students will able to understand cardiovascular responses using proper experimental techniques, drug efficacy and able to design & conduct clinical trails and ADR monitoring
CO5	students should able to understand the drug discovery process and able to develop a new through In silico techniques

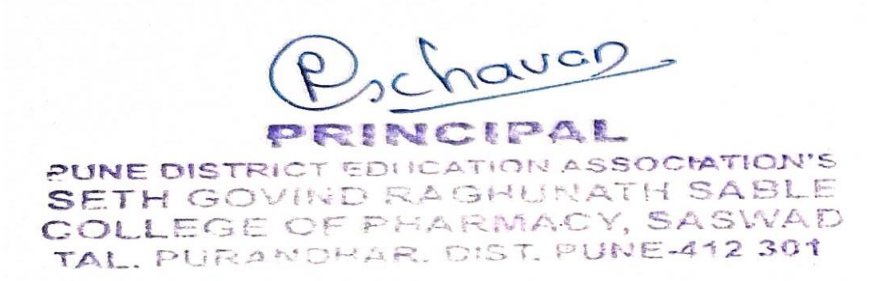
MPL201T Advanced Pharmacology-II [Theory | Regular]

CO ID.	Course Outcome
CO1	Discuss the pathophysiology and pharmacotherapy of certain diseases
CO2	Explain the mechanism of drug actions at cellular and molecular level
CO3	Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases

MPL203T Principles of Drug Discovery [Theory | Regular]

CO ID.	Course Outcome
CO1	Explain the various stages of drug discovery
CO2	Appreciate the importance of the role of genomics, proteomics and bioinformatics in drug discovery.

CO3	Explain various targets, biomarkers and in vitro screening techniques for drug discovery.
CO4	Explain various lead seeking method and lead optimization
CO5	Appreciate the importance of the role of computer aided drug design in drug discovery.

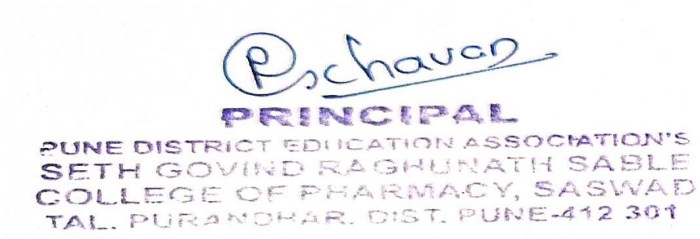


Course Outcome - [M Pharm (Pharmacology)]

Semester I	
(MPL 103T Pharmacological and Toxicological Screening Methods-I [Theory | Regular]	
CO ID.	Course Outcome
CO1	Appraise the regulations and ethical requirement for the usage of experimental animals.
CO2	Describe the various animals used in the drug discovery process and good laboratory practices in maintenance and handling of experimental animals
CO3	Describe the various newer screening methods involved in the drug discovery process
CO4	Appreciate and correlate the preclinical data to humans
MPAT101T Modern Pharmaceutical Analytical Techniques [Theory | Regular]	
CO ID.	Course Outcome
CO1	Understand Analytical techniques for identification, Characterization and quantification of drugs
CO2	To learn theoretical and practical skills of instrument handling and use
CO3	Understand Structural Elucidation of organic compounds using data of spectroscopic tools such as UV, IR, NMR, Mass spectrometer, HPLC
MPL102T Advanced Pharmacology-I [Theory | Regular]	
CO ID.	Course Outcome
CO1	Discuss the pathophysiology and pharmacotherapy of certain diseases
CO2	Explain the mechanism of drug actions at cellular and molecular level
CO3	Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases
MPL104T Cellular and Molecular Pharmacology [Theory | Regular]	
CO ID.	Course Outcome
CO1	Explain cellular structure and functions and cell regulation
CO2	Describe molecular and cellular cell signalling pathways & Principles and applications of genomic and proteomic tools
CO3	Principles , applications and recent advances in gene therapy principles and applications of Pharmacogenomics
CO4	Explain the Principles and applications of proteomics science
CO5	Describe in detail Principles and applications of Immunotherapeutic &Describe Cell culture techniques and biosimilars
MPL105P Pharmacology Practical-I (Part-I and II) [Practical | Regular]	
CO ID.	Course Outcome
CO1	Students should able to design & analyze the given sample of drugs using spectroscopic, chromatographic, fluorimetry and flame photometry
CO2	Students should able to perform experiments for CNS related activities, diuretics and GI effects
CO3	Students should able to handle molecular techniques to understand molecular biology, including invitro cell culture techniques
CO4	Students should able to assess the genetic alteration using molecular techniques

Semester III

MRM301T Research Methodology and Biostatistics [Theory | Regular]	
CO ID.	Course Outcome
CO1	Develop the ability to apply the methods while working on a research project work
CO2	Describe the appropriate statistical methods required for a particular research design
CO3	Choose the appropriate research design and develop appropriate research hypothesis for a research project
CO4	Develop a appropriate framework for research studies



Course Outcome - [M Pharm (Pharmaceutics)]

Semester II	
MPH201T Molecular Pharmaceutics (Nano Tech and Targeted DDS) [Theory | Regular]	
CO ID.	Course Outcome
CO1	Design drug delivery systems for targeting drugs to tumours and to the brain
CO2	Prepare and evaluate nanoparticles and liposomes as carriers for drug targeting
CO3	Select drugs and polymers in the design of microspheres and microcapsules for various applications.
CO4	Formulate aquasomes, niosomes, phytosomes and electrosomes for various applications in drug targeting
CO5	Develop strategies for improving nasal absorption in the design of nasal drug delivery systems
MPH202T Advanced Biopharmaceutics & Pharmacokinetics [Theory | Regular]	
CO ID.	Course Outcome
CO 1	The basic concepts in bio pharmaceutics and pharmacokinetics.
CO 2	The critical evaluation of biopharmaceutical studies involving drug product equivalency
CO 3	The design and evaluation of dosage regimens of the drugs using pharmacokinetic and bio pharmaceutics parameters.
MPH203T Computer Aided Drug Development [Theory | Regular]	
CO ID.	Course Outcome
CO 1	History of Computers in Pharmaceutical Research and Development
CO 2	Computational Modeling of Drug Disposition
CO 3	Computers in Preclinical Development
CO 4	Optimization Techniques in Pharmaceutical Formulation
MPH204T Cosmetic & Cosmeceuticals [Theory | Regular]	
CO ID.	Course Outcome
CO 1	Key ingredients used in cosmetics and cosmeceuticals
CO 2	Key building blocks for various formulations.
CO 3	Various key ingredients and basic science to develop cosmetics and cosmeceuticals
CO 4	Scientific knowledge to develop cosmetics and with desired Safety, stability, and efficacy
MPH205P Pharmaceutics Practical-II [Practical | Regular]	
CO ID.	Course Outcome
CO 1	To design, formulate and evaluate microparticulate and nanoparticle formulations and to assess the effect of different process variables on their performance
CO 2	To assess, analyze and correlate the in vitro and in vivo performance of developed pharmaceutical product as per the guidelines
CO 3	To formulate and evaluate herbal and conventional cosmetics

Course Outcome - [M Pharm (Pharmaceutics)]

Semester I	
MPAT101T Modern Pharmaceutical Analytical Techniques [Theory | Regular]	
CO ID.	Molecular Pharmaceutics (Nano Tech and Targeted DDS)
C01	Understand Analytical techniques for identification, Characterization and quantification of drugs
CO2	To learn theoretical and practical skills of instrument handling and use
CO3	Know about Structural Elucidation of organic compounds using data of spectroscopic tools such as UV, IR, NMR, Mass spectrometer, HPLC , GC
MPH 102 T Drug Delivery System [Theory | Regular]	
CO ID.	Course Outcome
CO 1	The various approaches for development of novel drug delivery systems
CO 2	The criteria for selection of drugs and polymers for the development of delivering system
CO 3	The formulation and evaluation of Novel drug delivery systems
MPH103T Modern Pharmaceutics [Theory | Regular]	
[illegible] ID.	Course Outcome
CO1	Understand the concept and importance of preformulation parameters
CO2	Have knowledge of optimization techniques and their applications in pharmaceutical industries.
CO3	Apply the statistical design in the development of different formulations.
CO4	Know the scope and merits of validation and different types of validation
CO5	Understand the importance of industrial management principles and GMP Considerations.
CO6	Know the compression and consolidation parameters for powders and granules in tablet development.
CO7	Understand the importance of materials management and production management in pharmaceutical industries
CO8	To know about diffusion, dissolution and pharmacokinetic parameters.
MPH104T Regulatory Affair [Theory | Regular]	
CO ID.	MPH205P
CO1	Discuss the concept of innovator and generic drugs, drug development process
CO2	Develop strategies for improving nasal absorption in the design of nasal drug delivery systems
CO3	Categorize the preparation of dossiers and their submission to regulatory agencies in different countries
CO4	Assess the post approval requirements for actives and drug products
MPH105P Pharmaceutics Practical-I (Part-I and II) [Practical | Regular]	
CO ID.	Course Outcome
CO1	Understand how to analyze and estimate the organic compounds and biological by spectroscopic, fluorimetry, flame photometry methods
CO2	Learn to separate the impurities or mixtures of organic compounds by using column chromatographic, HPLC, and gas chromatography methods

CO 3	Formulation and Evaluation of Various Drug Delivery Systems.
CO 4	Pre-formulation studies of tablets and graphical analysis of data

Semester III

MRM301T Research Methodology and Biostatistics [Theory | Regular]

CO ID.	Course Outcome
CO1	Develop the ability to apply the methods while working on a research project work
CO2	Describe the appropriate statistical methods required for a particular research design
CO3	Choose the appropriate research design and develop appropriate research hypothesis for a research project
CO4	Develop an appropriate framework for research studies