VISWANADHA INSTITUTE OF PHARMACEUTICAL SCIENCES
Affiliated to J.N.T.U.K-Kakinada, Approved by PCI & A.I.C.T.E, New Delhi
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2.6.2 ATTAINMENT OF POs AND COs ARE EVALUATED

B. Pharm: The course outcomes (COs) for B.Pharm theory subjects are measured using Internal assessment (25 marks) of which 10 marks for continuous mode based on attendance (4 marks), academic activities (3 marks), student-teacher interaction (3 marks) and 15 marks for the sessional exam.The average marks of two sessional exams are internal assessment. End semester examination is calculated for 75 marks conducted by the affiliated university (JNTUK & JNTUGV).

COs in the B. Pharm practical subjects are measured using internal assessment (15 marks) of which 5 marks are calculated based on attendance (2 marks), academic activities (1.5 marks), student-teacher interaction (1.5 marks) and 10 marks for sessional exam. The external examination marks are released by the affiliated university on the grade scale of 35 marks examination along with internal marks (15 marks).Practice school marks are evaluated for 150 marks in the VII semester. Project marks are assessed for 150 marks in the VIII semester.

M.Pharm & Pharm.D: The course outcomes (COs) for M. Pharm & Pharm.D. M.Pharm. theory subjects are measured using internal assessment (25 marks) of which 10 marks for continuous mode based on attendance (8 marks), student-teacher interaction (2 marks) and 15 marks for sessional exam. Pharm.D theory subjects are measured using internal assessment (30 marks). The average marks of two sessional exams are internal assessment in M.Pharm and best of two sessional exams are internal assessment in Pharm.D. End semester or year examination is calculated for 75 marks in M.Pharm. & 70 marks in Pharm.D conducted by the affiliated university (JNTUK & JNTUGV).

COs in the M. Pharm practical subjects are calculated using internal assessment (25 marks) of which 10 marks are calculated based on attendance, records and regular viva voce and 15 marks for sessional exam. M.Pharm external examination marks are released in the grade scale for 50 marks examination along with internal marks (25 marks). Research work marks are evaluated for 350 marks in III semester. Research work and colloquium marks are assessed for 400 marks in IV semester.

Pharm.D practical subjects are measured using internal assessment (30 marks) in which 10 marks are calculated based on regularity, records and regular viva voce and 20 marks for sessional exam. Pharm.D external examination marks are released for 70 marks along with internal marks (30 marks). Clerkship marks are evaluated for 100 marks and Project marks are assessed for 100 marks in V year.

If the student gets at least 50% marks, including internal and external marks, then the student is considered to have attained the COs. If the total mark is less than 50%, the student has failed to achieve the COs.

P. Uma devi

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Program: Pharmacy

Programme Outcomes (PO):

PO Nos.	Program Objective	Program Outcomes
PO1	**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; and manufacturing practices.
PO2	**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.
PO3	**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.
PO4	**Modern tool usage**	Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations
PO5	**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 responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
PO6	**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).
PO7	**Pharmaceutical Ethics**	Honor 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.
PO8	**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.

PO9	**The Pharmacist and Society**	Apply reasoning informed by the contextual knowledge to assess Societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
PO10	**Environment and sustainability**	Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development.
PO11	**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

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COURSE OUTCOMES FOR B.PHARMACY

B-PHARMACY I SEMESTER (I YEAR) (PCI Regulation)			
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Human Anatomy and Physiology-I (Theory)	BP101 T		**Upon completion of the course student will be able to**
		1	Get knowledge on different cells and tissues was involved in the formation of organs and its different functions in human body.
		2	Get knowledge on different parts , composition and its functions of skin, skeletal system and joints .
		3	Get knowledge on cellular composition and non cellular compositions of Blood and how it is involved in oxygen and carbon dioxide transport, maintenance of B.P, defense immunity and excretion.
		4	Have knowledge on parts and functions of nervous system and special senses, their coordination in regulation of homeostatic mechanisms and their imbalances.
		5	Have knowledge on external and internal characters of Heart and blood vessels maintain BP, transport gases, nutrients and waste products. Their function is essential to sustain life.
Human Anatomy and Physiology-I (Practical)	BP107P		**Upon completion of the course student will be able to**
		1	Get knowledge on instruments used in experimental human anatomy and Physiology its operation.
		2	Know differences like structural composition and functional nature of different living cells and tissues using reference slide.
		3	Know location, structural features of skeletal system in the body.
		4	Know principles and procedures involved in heamotology and heamocytometry.
		5	Get knowledge on instruments used in experimental heamocytometry and heamatology its operation.
		6	Have idea about heamotological parameters and its physiological importance to diagnose disease in the body.
		7	Know about physiology of heart and their coordinated functions using instruments for diagnosis of diseases.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical Analysis-I (Theory)	BP102T		**Upon completion of the course student will be able to**
		1	Discuss the fundamentals of volumetric analysis and illustrate the sources of errors in analytical techniques methods to minimize them, use different methods to express concentration.
		2	Employ different theories (Indicator theory, Law of mass action, Henderson hasselbach equation) in acid base titration and distinguish from Non aqueous titration.
		3	Demonstrate adequate knowledge on basic principles and techniques in complexometry and precipitation titrations. Understand and explain the difference between precipitation and gravimetric analysis.
		4	Clarify different terms and principles of Oxidation and reduction reactions.
		5	Well acquainted with principles of electro chemical methods of analysis.
Pharmaceutical Analysis- I (Practical)	BP108 P		**Upon completion of the course student will be able to**
		1	Perform limit tests for chlorides, sulphates, Iron, Arsenic.
		2	Generalize the apparatus and glassware used in analytical chemistry.
		3	Prepare and standardize primary and secondary standard solutions of various Normality and Molarity.
		4	Articulate the principle, Reaction conditions and factor calculation for data analysis for various volumetric methods of analysis and application of pharmacopoeial purity.
		5	Determine the normality by Electrochemical methods of analysis.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmaceutics I (Theory)	BP103 T		**Upon completion of the course student will be able to**
		1	Know the history of profession of pharmacy, basic knowledge on various pharmacopoeias and career in pharmacy. Understand the professional way of handling the prescription, factors influencing the dose of drug and dose calculations.
		2	Understand the basics regarding formulation of powders &soluiblity enhancement techniques for liquid dosage forms and will be thorough in doing pharmaceutical calculations.
		3	Understand about the preparation of various conventional dosage forms like monophasic and biphasic liquid dosage forms.
		4	Know the preparation of suppositories and understand various pharmaceutical incompatibilities.
		5	Understand the preparation of various semisolid dosage forms and their evaluations.
			Upon completion of the course student will be able to
		1	Gain skill in the operation of common pharmaceutical measuring, weighing and compounding devices.

Pharmaceutics I (Practical)	BP109P	2	Perform dispensing of mixtures, solutions, emulsions, creams and ointments
		3	Perform dispensing of powders, pastes, lotions, liniments, inhalations and paints.
		4	Identify incompatibilities in prescription and dispensing of such prescriptions.
		5	Perform dispensing procedures involving pharmaceutical calculations.
		5	Perform dosage calculations for pediatric and geriatric patients.
		6	Dispense the prescriptions involving adjustment of tonicity.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical Inorganic Chemistry (Theory)	BP104 T		**Upon completion of the course student will be able to**
		1	Understand the history of pharmacopoeia, sources and types of impurities and describe the official methods of control like limit tests.
		2	Acquires knowledge on acids, bases, buffers, buffered isotonic solutions, methods of adjusting isotonicity and major extra and intra cellular electrolytes and know the monographs of dental products.
		3	Classify the gastrointestinal agents and described the methods of preparation, properties, storage, assay and uses with marketed formulations of inorganic compounds in gastrointestinal agents.
		4	Classify the miscellaneous compounds and know the monographs of inorganic compounds in each category.
		5	To understand the radioactivity and study of different radioisotopes, storage, precautions and applications of radioactive substances.
Pharmaceutical Inorganic Chemistry (Practical)	BP110P		**Upon completion of the course student will be able to**
		1	Identify impurities from pharmaceutical substances
		2	Apply the skills of qualitative analysis of unknown samples
		3	Compute, quantitate and record purity of inorganic pharmaceuticals
		4	Develop mathematical approach to calculate quantitative parameters for synthesized compounds.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Communication skills (Theory)	BP105T		**Upon completion of the course student will be able to**
		1	Understand and apply knowledge of human communication and language processes as they occur across various contexts, e.g., interpersonal, intrapersonal, small group, organizational, media, gender, family, intercultural communication, technologically mediated communication.
		2	Find, use, and evaluate primary academic writing associated with the communication discipline
		3	Develop knowledge, skills, and job-ready skills in Pharmaceutical industry that facilitate their ability to work collaboratively with others.
		4	Enhance communication competencies such as managing conflict, understanding small group processes, active listening, appropriate self-disclosure, and other work place norms.
		5	Learn interview skills.
Communication skills (Practical)	BP111P		**Upon completion of the course student will be able to**
		1	Use contextual expressions in English and sounds in English language
		2	Improve communication skills develop the knowledge of letters and sounds in English language
		3	Improve listening skills
		4	Improve and use the language skills
		5	Improve Writing Skills
		6	Apply listening , reading and writing skills while facing Interviews
		7	Make use of the various group discussions conducted in regular lab sessions. Apply the skills of making presentations in real life
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Remedial Biology (Theory)	BP106RB T		**Upon completion of the course student will be able to**
		1	Know the anatomical Principles followed by scientists for classification of five kingdomanimals and its salient features.
		2	Get knowledge on different parts of plants and its morphological and anatomical characters and its importance.
		3	Know the basic components of human anatomy & physiology of prescribed systems.
		4	Know the basic components in plant anatomy & physiology.
		5	Know the plant growth and its regulation .
		6	Know the basic structural and functional organization of living organism.
Remedial Biology (Practical)	BP112RBP		**Upon completion of the course student will be able to**
		1	Get knowledge on instruments used in experimental biology and its operation.
		2	Know the Principles and procedures involved in staining techniques for the preparation of slide.
		3	Grasp knowledge on different cellular composition and its importance in living organism.
		4	Getting knowledge about morphological features and modified morphological features and its importance of different parts of plant.

		5	Know about anatomical features and physiological features with reference to human by simulatory model.
		6	Grasp knowledge on different cellular composition of different parts of plant.
		7	Get an overview on different types of blood grouping and its importance.
		8	Know comparison of various respiratory physiological parameters and its importance for diagnosis of disease.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Remedial Mathematics (Theory)	BP106RMT		**Upon completion of the course student will be able to**
		1	Know Basic mathematical operations
		2	Know trigonometry mostly used in any sciences.
		3	Draw lines, finding the equations for the purpose of relational study
		4	Know Basic calculus which is used in analytical study of their life sciences applications
		5	Know Some advanced calculations in Research or Project works
		6	Enrich analytical skills in research study
B-PHARMACY IISEMESTER (I YEAR) (PCI Regulation)			
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Human Anatomy and Physiology II (Theory)	BP201T		**Upon completion of the course student will be able to**
		1	Get knowledge on parts of Brain and neurons their involvement in sensory and motor functions including pain persumption, sleep wake cycle, cognitive skills, memory, behavior, governance , Chemical Mediators like Acetyl choline, Serotinine, Dopamine, Noradrenaline, glutamic acid, gaba involvement in transmission of impulse and disorders due to their changes.
		2	Get knowledge on the digestion in various parts of GIT, enzymes and secretions involved – their functions.
		3	Get knowledge on external and internal characters of respiratory system and external and internal respiration exchanging of gases, need for oxygen for metabolism of nutrients and generation of energy and is essential for life process, parts of urinary system and how urine is formed and various mechanisms involved in formation of urine.
		4	Know external and internal characters of various endocrine glands and their functions like Growth, reproduction and metabolism depend on hormonal activity. Their imbalance leads to disorders and some of them cannot be rectified.
		5	Get knowledge about parts of reproductive system andConcept of male & female hormones, Characters, sex cell maturity, reproductive period, copulation and pregnancy, parturition, concept of pregnancy, menopause and their care.
Human Anatomy and Physiology II (Practical)	BP207 P		**Upon completion of the course student will be able to**
		1	Get knowledge on instruments used in experimental Physiology its operation.
		2	Know differences like structural composition and functional nature of different living cells and tissues in skin and its role.
		3	Know location, structural features of nervous system and endocrine system in the body.
		4	Describe principles and procedures involved in sensory performances in the body.
		5	Get knowledge on instrumental techniques used in experimental body temperature recording.
		6	Know mechanisms involved in homeostasis for protection of body.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical Organic Chemistry I(Theory)	BP202T		**Upon completion of the course student will be able to**
		1	Familiar with structure, nomenclature and isomerism of organic compounds.
		2	Understand preparations, reactions , properties, orientation of reactions.
		3	Understand nucleophillic substitutions, reactivity and stability of various organic compounds. It also account for various qualitative test for the identification of compounds.
		4	Acknowledge the mechanisms for named reactions and structure, uses of pharmaceutically active compounds.
		5	Know brief information on preparation, properties, identification test for compounds.
Pharmaceutical Organic Chemistry I (Practical)	BP208P		**Upon completion of the course student will be able to**
		1	Perform functional group analysis for organic compounds, melting point & boiling point determination.
		2	Prepare suitable solid derivatives from organic compounds.
		3	Perform molecular models.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Biochemistry (Theory)	BP203 T		**Upon completion of the course student will be able to**
		1	Understand the biological role of carbohydrates, lipids, nucleic acids, amino acids and proteins.
		2	Know the concepts of carbohydrate metabolism, electron transport chain and oxidative phosphorylation.
		3	Understand the Catabolism of lipids and aminoacids and their related disorders
		4	Gain knowledge on metabolism of nucleic acids and and genetic information transfer
		5	Have cognizance of enzyme kinetics, regulation of enzymes,therapeutic and diagnostic applications of enzymes
			Upon completion of the course student will be able to

Biochemistry (Practical)	BP209 P	1	Perform qualitative analysis of carbohydrates and identification tests for proteins
		2	Perform quantitative analysis of reducing sugars and proteins, and qualitative analysis of urine for abnormal constitutents.
		3	Determine blood creatinine and blood sugar
		4	Determine serum total cholesterol
		5	Analyze enzymatic hydrolysis of starch and can determine Salivary amylase activity
		6	Determine the effect of temperature on salivary amylase activity and effect of substrate concentration on salivary amylase activity
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pathophysiology (Theory)	BP204T		**Upon completion of the course student will be able to**
		1	Describe abnormal physiologic processes associated with common disease processes
		2	Explore the most common etiologies and predisposing factors associated with human disease.
		3	Identify the mechanisms that cause alterations in hormone secretion
		4	Identify the classification of tumors and stages of cancer spread. Explain the difference between benign and malignant neoplasms
		5	Describe the structure and function of cells and tissues, Cellular adaptations that result from environmental stresses.
		6	Explain age-related differences in physiologic and patho physiologic processes and their clinical manifestations.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Computer Applications in Pharmacy (Theory)	BP205T		**Upon completion of the course student will be able to**
		1	Know various types of application of computers in pharmacy.
		2	Know the various types of databases.
		3	Know the various applications of databases in pharmacy
		4	Familiar with overview of the computers and MS-office
		5	Familiar with internet, WWW, browsing, HTML & e-mails.
		6	Familiar with Database management
Computer Applications in Pharmacy (Practical)	BP210P		**Upon completion of the course student will be able to**
		1	Use MS Word, MS Access for designing questionnaire, form to record patient information, creating patient database, mailing labels, invoice table, and generate reports
		2	Create HTML web page, Export Tables, Queries, Forms and Reports to web pages and XML Pages
		3	Know the various types of application of computers in pharmacy.
		4	Know various types of databases and its applications in Pharmacy
		5	Store the drug information in the database and how to retrieve the information of a drug
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Environmental sciences (Theory)	BP206T		**Upon completion of the course student will be able to**
		1	Understand basics of environment like ecology, ecosystem, food chain, food web and ecological pyramids.
		2	Know the different natural sources and their conservation to save the environment.
		3	Know the current problems of environment and how to solve them, Role of individual in conservation of environment and natural resources.
		4	Understand the different factors of environmental pollution and measures to minimize it.
		5	Aware about hazards of disposal wastes from hospitals and pharmaceutical industries.
		6	Know the Disaster management in natural calamities.
B.Pharmacy III Semester (II Year) (PCI Regulation)			
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical Organic Chemistry II (Theory)	BP301 T		**Upon completion of the course student will be able to**
		1	Brief information of orbital structure, resonance and reactions of benzene. It also includes detailed information on electrophillic substitution reactions.
		2	Acquire knowledge on methods of preparations, reactions, acidity and test for the determination of phenols and amines.
		3	Emphasise on rancidity of oils to determine the best oils.
		4	Acknowledge synthesis, reactions of polynuclear hydrocarbons
		5	Familiar with synthesis , reactions of cycloalkanes and it accounts for Bayer's strain & Mohr's theories.
Pharmaceutical Organic Chemistry II (Practical)	BP305P		**Upon completion of the course student will be able to**
		1	Perform Recrystallisation & Steam distillation
		2	Determine Acid value, Saponification value, Iodine value, as a result they can have knowledge on rancidity of oils and able to determine best oil.

		3	Know preparation and synthesis of various pharmaceutically active organic compounds.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Physical Pharmaceutics I (Theory)	BP302 T		**Upon completion of the course student will be able to**
		1	Understand and describe the principles, energetics of adsorption at liquid interfaces, to apply the electrical properties of interfaces and parameters relevance to pharmacy
		2	Describe the relationship between activity co efficient and the buffer equations knowing the factors influencing the pH of the solution and Calculate solution's tonicity and tonicity adjustments
		3	Illustrate the utility of super critical fluids and to appreciate the differences in the strength of the inter molecular forces and types of states of matter
		4	Define saturated solution, solubility and unsaturated solutions with complete knowledge on partial miscibility
		5	Classify the complexes and determining the methods of analysis of complexes
Physical Pharmaceutics I (Practical)	BP306 P		**Upon completion of the course student will be able to**
		1	Determine the Surface tension of given liquids by drop count and drop weight method
		2	Determine the HLB Number of Surfactants by Saponification method with the determination of freundlich and langmuir constants by using activated charcoal
		3	Demonstrate the calibration of pH and determine the pH by half neutralization method
		4	Determine the critical solution temperature by phenol water system
		5	Determine the solubility of drug at room temperature with partition coefficient of benzoic acid and Iodine in different Solvent media
		6	Determine the stability constant and donor acceptor ratio of PABA CAFFEINE and Cupric chloride Glycine
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical Microbiology (Theory)	BP303 T		**Upon completion of the course student will be able to**
		1	Acquire the knowledge about the different characteristic of prokaryotics, eukaryotics organism, the methods of identification, cultivation and preservation of organisms.
		2	Describe the importance and implementation of sterilization and staining methods
		3	Define the disinfectant, antiseptic,bactriostatic, bactericidal and their factors influencing, evaluation methods. Describe the strility testing of pharmaceutical products
		4	Demonstrate the design of asaptic area, laminar chamber and microbiological standardization of pharmaceuticals
		5	Understand the microbial spoilage, contamination and their assessment. Cell culture technology and their application
Pharmaceutical Microbiology (Practical)	BP307 P		**Upon completion of the course student will be able to**
		1	Understand the different equipments and processing used in experimental microbiology
		2	Determine the sterilization of glassware, preparation, sterilization of media, sub culturing of bacteria and fungus. Nutrient stabs and slants preparations
		3	Perform the methods of Simple, Gram's staining and acid fast staining
		4	Isolate the pure culture of micro-organisms by multiple streak plate technique
		5	Determine the Microbiological assay of antibiotics by cup plate method, Motility determination by Hanging drop method
		6	Analyse the sterility testing of pharmaceuticals, Bacteriological analysis of water and biochemical test.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical Engineering (Theory)	BP304 T		**Upon completion of the course student will be able to**
		1	Understand fluid flow concepts – Reynold's number, viscosity, measurements of flow and pressure, theories and mechanisms involved in size reduction and size separation.
		2	Understand evaporation process ,theory of evaporation- and Evaporators used in pharmaceutical industry, principles and theory of Heat flow transfer through Conductions, Convection and Radiation mechanisms and various distillation equipments .
		3	Understand procurement of information regarding drying, Moisture content, types of dryers -their construction, working and applications and able to understand the concept of mixing mechanisms of solid-solid, solid-liquid & liquid-liquid and about various mixing equipments.
		4	Understand theory and equipments of filtration and centrifugation used in laboratory as well as in industrial scale.
		5	Understand various types of materials used for plant construction and to appreciate preventive methods used for corrosion.
			Upon completion of the course student will be able to
		1	Handle Ball mill equipment and calculate the energy requirement for the powders by the milling equipment. Carryout particle size reduction by Ballmill and calculate efficiency, critical speed and optimum speed of Ball mill. Determine Reynold's number at different heads (low, medium, high) by using Reynold's apparatus. Handle sieve shaker apparatus and perform size separation for the given powders.

Pharmaceutical Engineering (Practical)	BP308 P	2	Determine various factors effecting on Rate of evaporation like surface area, viscosity and temperature.Demonstrate the simple distillation apparatus.
		3	Determine moisture content and loss on drying. Effect of temperature on Rate of drying. Determine the Mixing index for solid-solid mixing. Construction of drying curves (for calcium carbonate and starch).
		4	aids on the rate of filtration
B.Pharmacy IV Semester (II year) (PCI Regulation)			
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical Organic Chemistry III (Theory)	BP401 T		**Upon completion of the course student will be able to**
		1	Acquire knowledge on Stereo-chemical aspects, dextro and levo rotatory isomers.
		2	Know detailed information on conformational isomers, stereo-selective and stereo-specific reactions.
		3	Familiar with synthesis, reactions, relative aromaticity of various heterocyclic compounds
		4	Know synthesis, reactions and uses of heterocyclic compounds.
		5	Brief information on mechanisms of various naming reactions.
	Course Code	**Course Outcome Number**	**Course Outcome**
Medicinal Chemistry I (Theory)	BP402 T		**Upon completion of the course student will be able to**
		1	Familiar with physic-chemical properties of drugs which influences biological action and drug metabolism pathways.
		2	Familiar with chemistry along with pharmacological action of sympathomimetic drugs.
		3	Know detailed information of metabolic pathways, therapeutic uses, mechanism of parasympathomimetic drugs.
		4	Acknowledge mechanism of various drugs and SAR of drugs acting on CNS.
		5	Get knowledge on chemistry and pharmacological actions of narcotics and anti-inflammatory drugs.
Medicinal Chemistry I (Practical)	BP406P		**Upon completion of the course student will be able to**
		1	Prepare and synthesize various pharmaceutically active organic compounds.
		2	Perform assay of drugs in order to determine the percentage purity.
		3	Determine the partition coefficient of two drugs.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Physical Pharmaceutics II (Theory)	BP403T		**Upon completion of the course student will be able to**
		1	Annotate the principles of characteristics of powdered particles, classify and execute the different methods of particle size and its derived properties
		2	Describe the settling and sedimentation theory and calculate sedimentation rates , define emulsions and its theories with formulation and stability
		3	Define the concepts of colloids and its phases and types with the application of its properties like optical, kinetic and electrical
		4	Demonstrate the concepts and factors influencing the viscosity of liquid and explain the Rheology of fluids
		5	Calculate the expiration date of different dosage forms and describe the accelerated stability studies
Physical Pharmaceutics II (Practical)	BP407P		**Upon completion of the course student will be able to**
		1	Determine the Particle size and its distribution by using Optical microscopy and sieving methods
		2	Determine and report the derived properties of powder and angle of repose
		3	Explain and determine the Methods of sedimentation volume by using the different suspending agents and concentration of same suspending agents.
		4	Demonstrate the concepts of viscosity and determine the viscosity of liquids and semi solids by using ostwald's viscometer and Brookfield viscometer
		5	Determine the reaction rate constants by first and second order reactions by using graphical and substitution methods
		6	Calculate the expiration date of different dosage forms and describe the accelerated stability studies
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmacology I (Theory)	BP404T		**Upon completion of the course student will be able to**
		1	Know basics of pharmacology like history, scope, general principles & Pharmacokinetics.
		2	Know basic concepts of Pharmacology, mechanism of action of drugs, Receptors, drug discovery, preclinical & clinical trails.
		3	Describe the basics of physiology and neurotransmitters and their roles. To gain knowledge on the drugs acting on ANS and muscle relaxants.
		4	Understand the role of neurotransmitters in the CNS and pharmacology of various classes of drugs acting on CNS.

		5	Impart knowledge on pathophysiology of various disease conditions of the CNS and pharmacology of drugs.
Pharmacology I (Practical)	BP408P		**Upon completion of the course student will be able to**
		1	Study of commonly used instruments in experimental pharmacology. Introduction to CPCSEA guidelines and OECD guidelines.
		2	Know introduction to animal physiology with their biochemical reference values in various animal species.
		3	Study of various routes of drug administration, anesthetics agents used to anesthetize laboratory animals and techniques of Euthanasia
		4	Study of physiological salt solutions, drug solution and use in various animal experiments.
		5	Study of methods for collection of blood, body fluids and urine from experimental animals.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmacognosy and Phytochemistry I (Theory)	BP405T		**Upon completion of the course student will be able to**
		1	Familiar with Sources of Crude drugs, and their Quality control methods
		2	Demonstrate the concepts and factors influencing Cultivation, Collection and Processing of Crude drugs
		3	Explain the concepts of Plant Tissue Culture and its applications in Pharmacy
		4	Acknowledge Alternative systems of Medicine
		5	Get knowledge on Primary and Secondary metabolites
Pharmacognosy and Phytochemistry I (Practical)	BP409P		**Upon completion of the course student will be able to**
		1	Perform Analysis of Crude drugs
		2	Determine the Leaf Constants
		3	Determine the Physical Parameters of Crude drugs
B.Pharmacy V Semester (III Year) (PCI Regulation)			
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Medicinal Chemistry II (Theory)	BP501T		**Upon completion of the course student will be able to**
		1	Understand the structure, MOA, SAR, synthesis, uses, and properties of Anti-histaminic agents.
		2	Understand the structure, MOA, SAR, synthesis, uses, and properties of Gastric proton pump inhibitors.
		3	Understand the structure, MOA, SAR, synthesis, uses, and properties of Antineoplastic agents.
		4	Understand the structure, MOA and uses of Antibiotics and Plant products
		5	Understand the structure, MOA, SAR, synthesis, uses, and properties of Anti-anginal (Calcium channel blockers, Diuretic and Antihypertensive agents)
		6	Understand the structure, MOA, SAR, synthesis, uses, and properties of Anti-arrhythmic drugs (Anti-hyperlipidemic agents, Coagulant & Anticoagulants and Drugs used in congestive heart failure)
		7	Understand the structure, MOA, SAR, synthesis, uses, and properties of Drugs acting on endocrine system (Sex hormones, Drugs for erectile dysfunction, Oral contraceptives, Corticosteroids, Thyroid and Anti-thyroid drugs)
		8	Understand the structure, MOA, SAR, synthesis, uses, and properties of Anti-diabetic agents.
		9	Understand the structure, MOA, SAR, synthesis, uses, and properties of Local anaesthetics.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Industrial PharmacyI– Theory	BP502T		**Upon completion of the course student will be able to**
		1	Learn about the science behind performing a Preformulation study before formulating a novel drug delivery system.
		2	Understand the advanced drug delivery systems and their applications.
		3	Understand the process of developing a formulation that is both safe and efficient for a patient.
		4	Know very well about orally administered solid dosage forms (Tablets, capsules and pellets) and liquid dosage forms (syrups, elixirs, suspensions and emulsions) with standard protocols.
		5	Know very well about novel drug delivery systems like parenterals, ophthalmic preparations and pharmaceutical aerosols with standard protocols.
		6	Understand about basics and legal aspects of cosmeticology and various formulations like dentifrices, lipsticks, nail polish and baby products etc.
		7	Understand how to select a suitable packaging option for the formulated dosage form to store it for extended periods.
		8	Know about the standard stability testing procedures for formulated dosage forms for better storage conditions.
Industrial PharmacyI (Practical)	BP506P		**Upon completion of the course student will be able to**
		1	Perform pre-formulation studies for any selected API
		2	Formulate and evaluate tablets using various granulation techniques like (wet, dry and direct compression) with selected APIs
		3	Coat the formulated tablets with appropriate coating solutions.
		4	Formulate and dispense hard gelatin capsules with selected APIs.
		5	Formulate some parenteral formulations like calcium gluconate and ascorbic acid injection

		6	Perform quality control tests for the selected marketed tablets
		7	Formulate ophthalmic preparations like eye ointments and eye drops
		8	Formulate and dispense creams like cold cream and vanishing cream
		9	Perform quality control tests for various packaging materials according to IP.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmacology II (Theory)	BP503T		**Upon Completion of this course student will able to**
		1	Familiarize with the pathophysiology of cardiovascular system and drugs acting on cardiovascular system.
		2	Understand the pathophysiology of disease of Hematopoietic system and drugs acting on it.
		3	Explain the pharmacology and rational use of drugs used for the treatment various endocrine disorders.
		4	Have basic knowledge of autocoids.
		5	Describe the principles, applications and types of bioassay, Evaluate the potency of unknown compound with reference to standard
Pharmacology II (Practical)	BP507P		**Upon Completion of this course student will able to**
		1	Know principles of bioassay, its types including advantages and disadvantages
		2	Determine the potency of a substance on isolated tissues.
		3	Explain the effect of drugs either alone or in combination on isolated frog's rectus abdominus muscle and frog's heart
		4	Explain and perform matching point, bracketing and interpolation bioassay to find unknown concentration of Acetylcholine.
		5	Demonstrate and discuss recording of effects of CNS acting drugs in rats/mice using Actophotometer and anti-epileptic activity using Convulsiometer with the help of software.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmacognosy and Phytochemistry II (Theory)	BP504T		**Upon Completion of this course student will able to**
		1	Learns about biogenetic studies and significance in drug discovery
		2	Know Chemistry, sources, commercial appplications of alkaloid drugs,volatile oil drugs,terpenoids, flavonoids, tannins, steroids, glycosides, resins
		3	Know Isolation, identification and analysis of phytoconstituents by HPLC etc.
		4	Understand Industrial production, estimation, and utilization of phytoconstituents
		5	Use modern methods in extraction, isolation, identification, and purification such as electrophoresis, spectroscopy, chromatography
Pharmacognosy and Phytochemistry II (Practical)	BP508P		**Upon Completion of this course student will able to**
		1	Learn and exercise techniques of Morphology, histology, powder characteristic, extraction, and detection by TLC or chemical tests of alkaloidal, glycosidal, volatile oil containing crude drug
		2	Learn and exercise techniques involving isolation and detection by TLC or chemical tests of active principles alkaloids, glycosides, steroids
		3	Learn and exercise Seperation of sugars by paper chromatography
		4	Learn and exercise TLC of herbal extract
		5	Learn and exercise Distillation of volatile oils and detection of phytoconstituents by TLC
		6	Learn and exercise Analysis of crude drugs-resins and glycosides by chemical tests
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical Jurisprudence (Theory)	BP505T		**Upon Completion of this course student will able to**
		1	Understand the Drugs and Cosmetics Act 1940 and its rules 1945.
		2	Understand about various schedules in the Drugs and Cosmetics Act and will have knowledge on various administrative bodies like DTAB, CDR, DCC etc.
		3	Know about pharmacy act 1948, Medicinal and Toilet Preparation Act 1955 and Narcotic Drugs and Psychotropic Substances Act 1985 and rules.
		4	Know about Drugs and Magic Remedies Act and its rules, Prevention of Cruelty to Animals Act 1960 and about National Pharmaceutical Pricing Authority.
B.Pharmacy VI semester (III Year) (PCI Regulation)			
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Medicinal Chemistry III – (Theory)	BP601T		**Upon completion of the course student will be able to**
		1	Understand the importance of drug design and different techniques of drug design.
		2	Understand the chemistry of drugs with respect to their biological activity of Antibiotics, Antitubercular drugs, Urinary tract anti-infective agents, Antiviral agents, Antifungal agents, Anti-protozoal Agents, Sulphonamides and Sulfones
		3	Know the metabolism, adverse effects and therapeutic value of drugs
		4	Know the importance of SAR of drugs.
		5	Understand combinatorial chemistry

Medicinal Chemistry III (Practical)	BP607P		**Upon Completion of this course student will able to**
		1	Synthesize the following drugs and intermediatesSulphanilamide 7-Hydroxy, 4-methyl coumarin Chlorobutanol Triphenyl imidazole Tolbutamide Hexamine
		2	Isonicotinic acid hydrazide Chloroquine Metronidazole Dapsone Chlorpheniramine maleate
		3	Prepare medicinally important compounds or intermediates by Microwave irradiation technique
		4	Draw structures and reactions using chem draw®
		5	Determine physicochemical properties such as logP, clogP, MR, Molecular weight, Hydrogen bond donors and acceptors for class of drugs course content using drug design software Drug likeliness screening (Lipinskies RO5)
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmacology III – Theory (Theory)	BP602T		**Upon completion of the course student will be able to**
		1	Know drugs used in respiratory disorders and GIT disorders
		2	learn in detail about various infectious agents, mechanisms, sensitivity, and resistance of different antiinfectives.
		3	Gain knowledge about different antiviral drugs pharmacology.antitubercular, antileprotics, use of MDT, and drug resistance
		4	Study in detail about cancer pathophysiology and pharmacology of different anticancer drugs, Immunosupressants
		5	Explain about toxicological studies and chronopharmacology.
Pharmacology III – Practical	BP608P		**Upon completion of the course student will be able to**
		1	Do dose calculation in pharmacological experiments
		2	Perform antiallergic activity by mast cell stabilization assay
		3	Study of anti-ulcer activity of a drug using pylorus ligand (SHAY) rat model andNSAIDS induced ulcer model.
		4	Study of effect of drugs on gastrointestinal motility
		5	Perform effect of agonist and antagonists on guinea pig ileum
		6	Estimate serum biochemical parameters by using semi- autoanalyser
		7	Study of effect of saline purgative on frog intestine
		8	Perform Insulin hypoglycemic effect in rabbit
		9	Perform test for pyrogens (rabbit method)
		10	Determine acute oral toxicity (LD50) of a drug from a given data
		11	Determine acute skin irritation / corrosion of a test substance
		12	Determine acute eye irritation / corrosion
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Herbal Drug Technology (Theory)	BP603T		**Upon completion of the course student will be able to**
		1	Learn about identification, authentication, processing of herbal raw material
		2	Know Indian systems of medicine,Ayurvedic formulation preparation
		3	Know good agricultural practices
		4	Study Neutraceutical market
		5	Know herbal drug interactions
		6	Know herbal cosmetic formulation preparation, excipients used
		7	Prepare herbal formulations like syrups, mixtures, tablets
		8	Know WHO&ICH guide lines for the evaluation of herbal drugs
		9	Know patenting and regulatory requirements for herbal drugs
Herbal Drug Technology	BP609P		**Upon completion of the course student will be able to**
		1	Perform preliminary phytochemical screening of crude drugs
		2	Learn and exercise techniques of Determination of alcohol content of asava and arista
		3	Learn and exercise techniques of Evaluation of excipients of natural origin
		4	Learn and exercise Cosmetic formulation (Preparation of dosage forms creams, lotions, shampoos) using standardized plant extract and evaluation as per pharmacopeial requirement
		5	Learn and exercise Therapeutic formulation (preparation of dosage forms syrups, mixtures, tablets) using standardized plant extract and evaluation as per pharmacopeial requirement

(Practical)	BP605T	6	Learn and exercise Monographanalysis of herbal drugs from recent Pharmacopeiasto standardize the herbal extract for the evaluation of identity and purity
		7	Learn and exercise Determination of total aldehyde content in herbal drugs or crude drugs to standardize the herbal extract for the evaluation of identity and purity
		8	Learn and exercise Determination of total phenol content in herbal drugs or crudedrugs to standardize the herbal extract for the evaluation of identity and purity
		9	Learn and exercise Determination of total alkaloid content in herbal drugs or crude drugs to standardize the herbal extract for the evaluation of identity and purity
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Biopharmaceutics and Pharmacokinetics – Theory	BP604T		**Upon completion of the course student will be able to**
		1	Understand the concept of Biopharmaceutics, Pharmacokinetics and their applications–absorption mechanisms, factors, their application with examples and also acquire knowledge on the concept of drug distribution, protein binding – factors.
		2	Acquire knowledge on the concept of elimination. Understand the concepts of bioavailability, bioequivalence, concepts, assessments, design, regulation, *in vitro* dissolution methods and *in vitro-in vivo* correlations.
		3	Describe the different pharmacokinetic models. Evaluate and estimate drug changes in the body by using pharmacokinetic models.
		4	Describe various multi compartment models and its significance.
		5	Understand the concept of Linear and Non-Linear kinetics, mechanisms and method of assessments.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical Biotechnology (Theory)	BP605T		**Upon Completion of This Course Student will able to**
		1	Understand regarding the enzyme immobilization and their different methods, applications in pharma field and study of some important enzymes like penicillinase, hyaluronidase, amylase, protease, streptodornase
		2	Describe the different types of pharmaceutical important products are prepared by r DNA technology like Human insulin, Intron, hepatitis vaccine and PCR.
		3	Explain the Immunity like cell mediated and humoral immunity and different bacterial, viral vaccine products. Trained regarding methods of collection of blood products, plasma substitutes
		4	Learn in detail about the Immuno blotting techniques such as western blotting, southern blotting, ELISA, microbial transformation and steroidal transformation and their application in pharmaceutical field.
		5	Acquire the knowledge in detail about the design of bioreactor, various methods of fermentation and production of penicillin vitamin B_{12} citric acid, glutamic acid and griseofulvin
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Quality Assurance (Theory)	BP606T		**Upon Completion of This Course Student will able to**
		1	Learn about the Quality management systems, ICH guidelines, TQM, ISO, NABL
		2	Understand the organisation personnel, premises, equipment, raw materials
		3	Understand the process of Quality control of rubber, container closures, secondary packing materials
		4	Know very well about study of complaints and documentation of pharmaceutical industry
		5	Know about the evaluation and calibration of equipments, good warehousing practices
B.Pharmacy IV Year I Semester (PCI Regulation)			
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Instrumental Methods of Analysis (Theory)	BP701T.		**Upon Completion of This Course Student will able to**
		1	Understand how to select a suitable analytical method for qualitative and quantitative analysis of a chemical constituents
		2	Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis
		3	Understand the chromatographic separation and analysis of drugs
		4	Discuss quantitative & qualitative analysis of drugs by using various analytical instruments
		5	Outline principles, instrumentations and applications of Electrophoresis
umental Methods of Analysis (Prac	BP705P.		**Upon completion of the course student will be able to**
		1	Learn and exercise the determination of absorption maxima and effect of solvents on absorption maxima of organic compounds
		2	Learn and exercise the determination of dextrose by colorimetry and sulfanilamide by colorimetry
		3	Simultaneous estimation of ibuprofen and paracetamol by UV spectroscopy
		4	Assay of paracetamol by UV- Spectrophotometry
		5	Estimation of quinine sulfate by fluorimetry
		6	Study of quenching of fluorescence
		7	Learn and exercise the determination of sodium by flame photometry
		8	Determination of potassium by flame photometry

		9	Determination of chlorides and sulphates by nephelo turbidometry
		10	Separation of amino acids by paper chromatography and sugars by thin layer chromatography
		11	Understand the concepts of experiments done using HPLC
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Industrial Pharmacy II(Theory)	BP 702T		**Upon completion of the course student will be able to**
		1	Outline the process of pilot plant and scale up of pharmaceutical dosage forms
		2	Understand the process of technology transfer from lab scale to commercial batch
		3	Summarize different laws and acts that regulate pharmaceutical industry
		4	Summarize the Concepts of Quality management
		5	Explain the approval process and regulatory requirements for drug products
Pharmacy practice (Theory)	BP 703T.		**Upon completion of the course student will be able to**
		1	Explain Organization of Hospital, Pharmacy therapeutic Committee and Pros and cons of drug distribution system
		2	Understand the Contents of Hospital pharmacy and functions of hospital pharmacist
		3	Classify drug interactions and adverse drug reactions and conduct therapeutic drug monitoring
		4	Estimate various pharmacokinetic parameters from the urinary excretion data
		5	Illustrate the role of Pharmacist in interdepartmental communication and community health education, Interpretation of Clinical laboratory results
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Novel Drug Delivery Systems	BP 704T		**Upon completion of the course student will be able to**
		1	Understand various approaches for development of Novel drug delivery system
		2	Outline the criteria for selection of drugs and polymers for development of Microencapsulation, Mucosal, Implantable drug delivery systems
		3	Summarize Basic components used, methods and types of formulation in transdermal, Gastroretentive and Nasopulmonary
		4	Summarize Basic components used, methods and types of formulation in Targeted drug delivery systems
		5	Explain the concepts of Intrauterine systems with its applications , intraocular barriers and formulations
Practice School	BP706PS		**Upon completion of the course student will be able to**
		1	To impart learning through experience.
		2	Enables students to have a smoother transition from academics to professional world.
		3	Enhances interpersonal skills, communication skills, leadership qualities
		4	Provides an opportunity to students to apply some of the ideas/skill sets in their careers, which also enhances their confidence levels
		5	Enables students to be aware of their personal strengths and limitations as professionals.

B.Pharmacy IV Year II semester (PCI Regulation)

Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
. Biostatistics and Research Methodology (Theory)	BP801T		**Upon completion of the course student will be able to**
		1	Determine the measures of central tendency and dispersion, correlation
		2	Determine regression, probability and hypothetical analysis
		3	Explain qualitative and quantitative design of research methodology
		4	Interpret the various statistical methods to solve statistical problems
		5	5. Analyze the experiments by using factorial design and design of experiments
Social And Preventive Pharmacy (T)	BP 802T		**Upon completion of the course student will be able to**
		1	Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide.
		2	Create awareness on prevention and control of various diseases
		3	Awareness about National Health care programs
		4	Have a critical way of thinking based on current healthcare development
		5	Evaluate alternative ways of solving problems related to health and pharmaceutical issues
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**

Pharma Marketing Management (T)	BP803ET.		**Upon completion of the course student will be able to**
		1	Acquire the concepts of Industry and competitive analysis; Analyzing consumer buying and industrial buying behavior.
		2	Understand the concepts about Product management in pharmaceutical industry.
		3	An overview of personal selling and online promotional techniques for OTC Products.
		4	Summarize the concepts of Designing channel and Strategic importance, tasks in physical distribution management.
		5	An overview of DPCO(Drug Price Control Order), NPPA (National Pharmaceutical Pricing Authority) and Emerging concepts in marketing:
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical Regulatory Science (T)	BP804 ET		**Upon completion of the course student will be able to**
		1	Understand the process of drug discovery and development
		2	Understand the concepts of Approval processes
		3	Explain the regulatory approval process and their registration in Indian and international markets
		4	Describe the monitoring aspects of clinical trials, GCP and Pharmacovigilance
		5	Outline the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Cosmetic Science (T)	BP809ET		**Upon completion of the course student will be able to**
		1	Understand the importance of quality in pharmaceutical products and are explored into importance of Good practices such as GMP, GLP etc.
		2	An overview of Principles of formulation and building blocks of skin care products
		3	3. Understand the concepts and Classification of Sunscreens and SPF
		4	Summarize the Principles of Cosmetic Evaluation
		5	6. Understand Cosmetic problems associated with Hair, Skin and scalp
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Project Work	BP813PW		**Upon completion of the course student will be able to**
		1	Generate the topic for the project and Collect the information from the relevant sources
		2	Assemble the information into a more realistic draft ethically and conclude the contents.
		3	Prepare the presentation and explain outcome of their project along with further scope for research. This develops their oratory and leadership skills
Pharm D I Year (PCI Regulation)			
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Human Anatomyand Physiology-I (Theory)	T1101		**Upon completion of the course student will be able to**
		1	Understand about the structure of human body from fundamental level.
		2	Know about structure of all human organs macroscopic to microscopic level.
		3	Get knowledge about the normal functioning of all organs present in human body.
		4	Understand about normal functions of all systems present in human being.
		5	Understand about coordination between various systems present in human body.
		6	Brief knowledge about few common diseases that occur in human being.
Human Anatomyand Physiology-I (Practical)	T1108		**Upon completion of the course student will be able to**
		1	Demonstrate skills for handling compound miscroscope and appliances used in hematological experiments
		2	Identify the various tissues and organs of different systems of human body.
		3	Perform the various experiments related to special senses and nervous system.
		4	Determine Blood pressure,Blood group and recording of temperature
		5	Determine R.B.C,W.B.C,Differential count of blood
		6	Study of various systems with the help of charts, models & specimens
		7	Determine ESR,haemoglobin content of the blood, bleeding time and clotting time
		8	Study of appliances used in experimental physiology.
		9	Record simple muscle curve using gastroenemius sciatic nerve preparation.

		10	Record simple summation curve using gastroenemius sciatic nerve preparation.
		11	Record simple effect of temperature using gastroenemius sciatic nerve preparation.
		12	Record simple effect of load & after load using gastroenemius sciatic nerve preparation.
		13	Record simple fatigue curve using gastroenemius sciatic nerve preparation.
		14	Perform pregnancy diagnosis test.
		15	Study of different family planning appliances
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
			Upon completion of the course student will be able to
		1	Know various types of dosage forms and Professional way of handling the prescription
		2	Know historical background and profession of pharmacy and career oppurtunities in pharmacy profession.
		3	Know various types of pharmacoepias , Development of Indian Pharmacopoeia and about the contents of monograph.
		4	Understand various Latin terms used in the prescription and how to measure weights in terms of imperial and metric systems and various pharmaceutical calculations.
Pharmaceutics (Theory)	T1102	5	Understand about various types of powders and granules its stability over other dosage forms and about preparation of effervescent powders and granules.
		6	Know different types of monophasic liquid dosage forms and its formulation aspects.
		7	Know biphasic liquid dosage forms, its formulation aspects and how to overcome stability problems.
		8	Gain information on preparation of semisolid dosage forms like suppositories
		9	Understand extraction and galenical products – Principles and procedures.
		10	Perform various pharmaceutical calculations
		11	Know various types of surgical dressings and information about suturing materials.
		12	Understand incompatibility and methods of overcoming incompatibility
			Upon completion of the course student will be able to
		1	Classify various conventional dosage forms in professional way and can able to handle the prescription and identify sources of errors in prescription.
		2	Gain skill in the operation of common pharmaceutical measuring, weighing and compounding devices. And can able to understand pharmaceutical terminology, abbreviations and symbols commonly used in the prescribing, dispensing, and charting of medications in the pharmacy.
Pharmaceutics (Practical)	T1109	3	Prepare various powders like Eutectic powder , Explosive powder , Dusting powder and Insufflations and can know about the advantage of solid dosage forms over other formulations.
		4	Formulate monophasic liquid dosage forms like syrups, elixers, linctuses, solutions.
		5	Formulate biphasic liquid dosage forms like emulsions and suspensions.
		6	Calculate displacement value and prepare suppositories
		7	Identify the type of incompatibility and preparing the formulation overcoming these incompatibilities.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
			Upon completion of the course student will be able to
		1	Have cognizance of the cell structure, various transport mechanisms of cell membrane
		2	Know the structure and functions, mechanism of action, applications of enzymes in therapeutic and diagnostic purpose.
		3	Acknowledge the most important carbohydrate "glucose" this can be broken down via glycolysis and enters Krebs cycle and oxidative phosphorylation to generate ATP.
		4	Apprehend the oxidation of fatty acids and synthesis of cholesterol and various diseases associated with lipid storage
		5	Gather the knowledge of biological oxidation-reduction reactions
Medicinal Biochemistry (Theory)	T1103	6	Familiar with catabolism of amino acids and various disorders of protein metabolism
		7	Gather the knowledge of protein synthesis and replication of nucleic acids
		8	Get the idea of role of clinical chemistry laboratory.
		9	Acquire the knowledge on urine analysis and various kidney function tests.
		10	Familiar with of liver pigments and various tests to assess liver functionality.
		11	Have intuition on various lipo proteins and its importance.
		12	Have an insight of immune chemical techniques.
		13	Have familiarity with electrolyte composition in various body fluids and its importance
			Upon completion of the course student will be able to
		1	Qualitatively analyze the normal and abnormal constituents of urine
Medicinal Biochemistry (Practical)	T110A	2	Quantitatively estimate the various constituents present in urine

		3	Study the factors affecting enzymatic activity
		4	Identify the lipids present in the given sample
		5	Quantitatively estimate the various constituents in serum.
		6	Do qualitative analysis of carbohydrates and identification tests for proteins
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical organic chemistry (Theory)	T1104		**Upon completion of the course student will be able to**
		1	Familiar with physical properties and isomerism.
		2	Acknowledge brief idea on name, structures, nomenclature of various organic compounds.
		3	Have idea on free radicals, its mechanism and relative basicity.
		4	Understand the alicyclic compounds, its preparation methods & theories.
		5	Familiar with nucleophiles and its substitution reactions (SN1&SN2), kinetics and stereochemistry of the nucleophillic substitution reactions.
		6	Have knowledge on alkyl halides, elimination unimolecular & bimolecular reactions via formation of carbocation and its orientation.
		7	Have cognizance of electrophiles, free radical addition reactions, peroxide effect.
		8	Understand free radical substitution and addition reactions of alkene
		9	Familiar with resonance, hyperconjugation, nucleophillic substitution reactions, elimination reactions, formation of conjugated dienes, its orientation and reactivity of addition to free radicals
		10	Understand Electrophillic substitution reations, ortho para directing groups, resonance stabilization of benzyl radical.
		11	Aware of carboxylic acids, its acidity , effect of substituents on its acidity, nucleophillic acyl substitution reactions.
		12	Have detailed emphasis on mechanisms for general naming reactions.
		13	Acknowledge mechanism of some named reactions.
		14	Know bimolecular displacement reactions, orientation and comparision with aromatic substitution.
		15	Have detailed idea to write oxidation & reduction reactions of some organic compounds.
		16	Predict synthesis, assay , uses of some pharmaceutically active organic compounds.
Pharmaceutical organic chemistry (Practical)	T110B		**Upon completion of the course student will be able to**
		1	Synthesize various pharmaceutically active organic compounds
		2	Identify and confirm various organic compounds
		3	Use stereo models
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical Inorganic chemistry (Theory)	T1105		**Upon completion of the course student will be able to**
		1	Facilitates the fellow pupil to predict the sources of errors and methods to determine impurities in inorganic drugs and pharmaceuticals.
		2	Develop the fundamentals of volumetric analytical skills. It constructs the fundamental methodology to prepare different strength of solutions.
		3	Acquires knowledge on acids, bases, buffers, methods of adjusting isotonicity.
		4	Associate the concept of standardization by oxidation – reduction methods.
		5	Gain knowledge on various non - aqueous solvents and different types of titrations.
		6	Develop an idea that standardization can be done for some compounds by precipitation titrations.
		7	Familiar with different classes of inorganic pharmaceuticals and their analysis by complexometry.
		8	Identification of different anions, cations and various indicators used for analysis of pharmaceuticals.
		9	Peculates the basic knowledge in the principles and concept of standardization by gravimetric methods.
		10	Acquainted with the principles and procedures of limit tests.
		11	Acquire the principles, procedures of analysis and applications of medicinal gases.
		12	Know various gastrointestinal agents like acidifiers, antacids, cathartics, antimicrobials and preparation, assay, properties and medicinal uses of some inorganic compounds of these classes.
		13	Know properties, preparations, assays and uses of a variety of inorganic compounds.
		14	Know expectorants, emetics, hematinics, poison and antidotes, astringents and preparation, assay, properties and medicinal uses of some inorganic compounds of these classes
		15	Characterize the medicinal and pharmaceutical importance of various electrolyte replensihers.
		16	Attain the knowledge on inorganic compounds those exist as pharmaceutical preparations and pharmaceutical aids.
		17	Analyze the importance of inorganic pharmaceuticals in preventing and curing the disease.
		18	Develop the ideas with the fundamental of analytical chemistry among the pupil.

		19	Know about the preparation, assay, properties and medicinal uses of various electrolytes and dental products.
		20	Atriculate the principles and procedures of analysis of drugs and also regarding the application of inorganic pharmaceuticals.
		21	Enumerate the basics of radioactive compounds and pharmaceutical applications of radioactive substances.
Pharmaceutical Inorganic chemistry (Practical)	T110C		**Upon completion of the course student will be able to**
		1	Gain the fundamentals of volumetric analytical skills analytical techniques in lab.
		2	Determine various impurities in inorganic drugs and pharmaceuticals.
		3	Identify and determine test for purity and preparation of some inorganic compounds.
		4	Ascertain the knowledge about assay of pharmaceutical substances.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Remedial Mathametics (Theory)	T1106		**Upon completion of the course student will be able to**
		1	Know Partial fraction, logarithm, matrices and determinant, analytical geometry, calculus, differential equation and Laplace transform
		2	Explain the different types of problems by applying theory of Partial fraction, Logarithms , Function, in Pharmacy Limits and continuity, Matrices and Determinant, Calculus
		3	Describe the concept of matrix. Definite and indefinite integral and its application in pharmacy
		4	Explain the basic concept of graphical representation and diagrammatic representation of data
		5	Apply mathematical concepts and principles to perform computations for Pharmaceutical Sciences.
		6	Communicate mathematical knowledge and understanding to help in the field of Clinical Pharmacy
		7	Create, use and analyze mathematical representations and mathematical relationships.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Remedial Biology (Theory)	T1107		**Upon completion of the course student will be able to**
		1	Get knowledge on composition of plant cell and its importance.
		2	Get knowledge on different cellular composition and its functions of different parts of plant and their modifications.
		3	Know classification of plants based on its taxonomical characters.
		4	Get knowledge on taxonomical characters of specified families.
		5	Get knowledge about structural composition of microorganisms.
		6	Get knowledge on structural composition of animal cell and its importance.
		7	Know the external and internal characters of different types of vertebrates.
		8	Get knowledge about poisonous animals in the environment.
Remedial Biology (Practical)	T110D		**Upon completion of the course student will be able to**
		1	Get knowledge on instruments used in experimental biology and its operation.
		2	Know the principles and procedures involved in staining techniques for the preparation of slide.
		3	Grasp knowledge on different cellular composition and its importance in living organisms (plants&Animal).
		4	Get knowledge about morphological features and modified morphological features and its importance of different parts of plant.
		5	Know about anatomical features and physiological features with reference to human by simulatory model.
		6	Grasp knowledge on different cellular composition of different parts of plant.
		7	Know different types of animals for its identification.
		8	Know about few plant physiology techniques.
Pharm D IIYear			
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pathophysiology (Theory)	T2101		**Upon completion of the course student will be able to**
		1	Describe abnormal physiologic processes associated with common disease processes
		2	Explore the most common Etiologies and predisposing factors associated with human disease
		3	Understand the basis for some laboratory tests and other diagnostic procedures.
		4	Understand how the various organ systems are interrelated, and use this understanding to promote a holistic approach towards the evaluation and treatment of patients.
		5	Explain age-related differences in physiologic and pathophysiologic processes and their clinical manifestations

Course	Course Code	Course Outcome Number	Course Outcome
Pharmaceutical Microbiology (Theory)	T2102		**Upon completion of the course student will be able to**
		1	Acquire the knowledge in detail about the different characteristic of microorganisms such as bacteria, virus, rickettsiae, spirochetes and nutritional requirements of the microorganisms
		2	Determine the impact of pharmaceutical significance of microorganisms, cultivation and identification of bacteria and role of different scientist involved in the development of microbiology field
		3	Gained the basis of bacterial growth curve, different growth pattern like batch culture, continuous culture, synchronous culture, chemostat and turbidostat methods.
		4	Learned in detail about the immunity , different types of immunity, active, passive immunity,phagocytosis, structure of antigen, types of antibodies, exo and endo toxin and booster dose.
		5	Understand the different types of sterilization methods to kill the pathogenic microorganisms like moist heat sterilization, dry heat sterilization, radiation, filtration and chemical substances involved for the sterilization of microorganisms.
		6	Explain the different diagnostic methods such as widal test, southern blotting, western blotting methods, PCR test and QBC test
		7	Understand regarding the diseases and their causative microorganisms and symptoms and treatment methods
		8	Trained regarding methods and principles involved in the microbiological assay of antibiotics, vitamins and aminoacids
Pharmaceutical Microbiology (Practical)	T2107		**Upon completion of the course student will be able to**
		1	Understand different equipments and processing used in experimental microbiology
		2	Determine and report the Sterilization of glassware, preparation and sterilization of media, Sub culturing of bacteria and fungus. Nutrient stabs and slants preparations
		3	Determine the methods of Simple, Grams staining and acid fast staining
		4	Isolate pure culture of micro-organisms by multiple streak plate technique
		5	Determine the Microbiological assay of antibiotics by cup plate method, Motility determination by Hanging drop method
		6	Know Sterility testing of pharmaceuticals, Biochemical test.
		7	Understand enumeration of micro-organisms (Total and Viable)& Determination of minimum inhibitory concentration,
		8	Perform microbiological assay of antibiotics by cup plate method, Microbiological assay of vitamins by Turbidometric method
		9	Determine RWC, Diagnostic tests for some common diseases, Widal, malarial parasite.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmacognosy & Phytopharmaceuticals (Theory)	T2103		**Upon completion of the course student will be able to**
		1	Know development of pharmacognosy from ancient to present
		2	Know the different classification methods of crude drugs
		3	Recognize crude drugs of pharmaceutical and medicinal importance and their microscopic study
		4	Understand the Cultivation methods of crude drugs
		5	Know the different methods of Adulteration and evaluation of Crude drugs
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmacognosy & Phytopharmaceuticals (practical)	T2108		**Upon completion of the course student will be able to**
		1	Understand well about cellwall constituents and cell inclusions
		2	Learn and experience techniques of macroscopical (colour, odour, taste, size,shape) and microscopical identification (T.S.) of crude drugs- alkaloids, glycosides,volatile oils, carbohydrates,resin crude drugs for the detection of identity and purity
		3	Learn and experience techniques of Quantitative chemical tests for lipid crude oils and drugs for the detection of identity and purity
		4	Learn and experience techniques of Chemical tests for carbohydrates, lipid crude drugs and oils, protein drug gelatin for the detection of identity and purity
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
			Upon completion of the course
		1	Students would have studied and learned about the importance of Pharmacokinetics i.e., Absorption, distribution, metabolism and excretion during selection of drugs and should have gained knowledge on Plasma drug concentration. Should have been thorough with the concepts of Pharmacodynamics. They wouid have come across the factors that modify
		2	Students should have learned about ANS neurotransmitters, and pharmacology of drugs in ANS

Pharmacology-I (Theory)	T2104	3	Students would have known about different cardiovascular disorders, detailed pharmacology of each class of drugs and multiple uses of same category of drugs like CCB's, Diuretics etc
		4	Students would have gained knowledge on various CNS neurotransmitters, their agonists, antagonists and the concepts on Psychopharmacology drugs.
		5	Students would have studied indetail about respiratory disorders and the pharmacological of different categories of drugs.
		6	Students would know the basis of hormonal disorders. To understand synthesis, storage, release and the actions of different hormones in the body. To gain a sound knowledge over the use of drugs to correct either the hypo conditions or hyper conditions and their side effects. To provide a clear idea regarding different Insulin or other hormonal preparations available in the market along with their advantages and disadvantages.
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Community pharmacy (Theory)	T2105		**Upon completion of the course student will be able to**
		1	Demonstrate knowledge of the business and professional practice management skills in community pharmacies.
		2	Demonstrate the prescription, legality & identification of medication related problems like drug interactions.
		3	Identify symptoms of minor ailments and provide appropriate medication.
		4	Participate in prevention programs of communicable diseases and exhibit professional ethics by promoting safe and appropriate medication use throughout society.
		5	Demonstrate the role of pharmacist in improving the adherence.
		6	Explain age-related differences in physiologic and pathophysiologic processes and their clinical manifestations.
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Pharmacotherapeutics-I (Theory)	T2106		**Upon completion of the course student will be able to**
		1	Know the pathophysiology and management of cardiovascular, Respiratory and Endocrine diseases.
		2	Understand the therapeutic approach to the management of these diseases.
		3	Know the importance of preparation of individualized therapeutic plans based on diagnosis.
		4	Develop clinical skills in the therapeutic management of these conditions.
		5	Know the controversies in drug therapy.
		6	Provide patient – centered care to diverse patients using the evidence based medicine.
Pharmacotherapeutics-I (Practical)	T2109		**Upon completion of the course student will be able to**
		1	Identify drug interactions and rationalize the prescription
		2	Discuss the therapeutic approach to management of selected diseases
		3	Prepare individualized therapeutic plans based on diagnosis
		4	Perform patient counseling
		5	Conduct planned experiments and prepare laboratory report in a standard forma
Pharma D III Year			
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Pharmacology-II (Theory)	T3101		**Upon completion of the course student will be able to**
		1	Understand the pathophysiology of disease of Hematopoietic system and drugs acting on it.
		2	Cognizance underlying mechanism on renal system.
		3	Acknowledge better understanding in pharmacology of chemotherapeutic agents.
		4	Have basic knowledge of immunopharmacology.
		5	Describe principles of bioassay, various types of toxicity studies and their procedure.
		6	Appreciate the knowledge on learning in depth knowledge on cell, macromolecules, cell signaling, DNA replication, cell cycle, gene and its structure
			Upon completion of the course student will be able to
		1	Study of commonly used instruments in experimental pharmacology. Introduction to CPCSEA guidelines and OECD guidelines.
		2	Know Introduction to animal physiology with their biochemical reference values in various animal species.
		3	Study of various routes of drug administration, anesthetics agents used to anesthetize laboratory animals and techniques of Euthanasia
		4	Study of physiological salt solutions, drug solution and use in various animal experiments.
		5	Study of methods for collection of blood, body fluids and urine from experimental animals.

Pharmacology-II (Practical)	T3107	6	Determine the potency of a substance on isolated tissues.
		7	Explain the effect of drugs either alone or in combination on isolated frog's rectus abdominus muscle and frog's heart
		8	Know introduction to principles of bioassay, its types including advantages and disadvantages
		9	Explain and perform matching point, bracketing and interpolation bioassay to find unknown concentration of Acetylcholine.
		10	Demonstrate and discuss recording of effects of CNS acting drugs in rats/mice using Actophotometer and anti-epileptic activity using Convulsiometer with the help of software.
		11	Demonstrate recording of effects of skeletal muscle relaxant drugs in rats/mice using Rota-rod apparatus and Analgesic activity using Eddy's Hot Plate with the help of software.
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical Analysis (Theory)	T3102		**Upon completion of the course student will be able to**
		1	Understand the concepts of QC/QA, GLP, ICH Guidelines and their importance in pharmaceutical industry.
		2	Develop the practical skills using instrumental techniques and gain knowledge on instrumental techniques for analysis of pharmaceuticals.
		3	Acquire knowledge on basic principles of electrochemical analytical techniques.
		4	Gain knowledge on the basic principles of spectroscopy, develop the practical skills using instrumental techniques, understand the knowledge about assay of pharmaceutical substances.
Pharmaceutical Analysis (Practical)	T3108		**Upon completion of the course student will be able to**
		1	Perform paper and thin layer chromatographic experiments and gain the knowledge on interpretation of data obtained after the experiment to conclude the results.
		2	Handle different instruments like spectrophotometers, flame photometer, HPLC and GC to analyze the pharmaceutical compounds.
		3	Have ability to develop basic practical skills using instrumental techniques.
		4	Ascertain the knowledge about assay of pharmaceutical substances.
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Pharmacotherapeutics II (Theory)	T3103		**Upon completion of the course student will be able to**
		1	Understand the pathophysiology and management of Cancer, Renal, Infectious and Skin diseases.
		2	Develop Patient case based Assessment Skills.
		3	Choose and justify appropriate drug and treatment duration to a given patient with regard to current recommendations and patient-related factors such as other diseases, age, organ functions and other drug treatment.
		4	Calculate creatinine clearance using the Cockroft-Gaults equation and by results and patient factors evaluate renal function and the need for adjustment of drug therapy
		5	Apply Knowledge and clinical skills to care of patients
		6	Provide patient – centered care to diverse patients using the evidence based medicine.
Pharmacotherapeutics-II (Practical)	T3109		**Upon completion of the course student will be able to**
		1	Identify drug interactions and rationalize the prescription
		2	Discuss the therapeutic approach to management of selected diseases
		3	Prepare individualized therapeutic plans based on diagnosis
		4	Perform patient counseling
		5	Conduct planned experiments and prepare laboratory report in a standard forma
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical Jurisprudence	T3104		**Upon completion of the course student will be able to**
		1	Understand the various concepts of the pharmaceutical legislation in India.
		2	Gain knowledge on Principles and Significance of professional ethics and about moral principles to be followed in the society.
		3	Learn the various laws governing the manufacturing, sale, research & usage of drugs. Understand significance of Schedule M and Schedule Y related Manufacturing & clinical trials. understand the labeling requirements and packaging guidelines for drugs and cosmetics.
		4	Know Laws as prescribed by the Pharmacy Council of India and information regarding duties of drug inspector and pharmacy Act.

		5	Gain knowledge on manufacture of Ayurvedic, Homeopathic preparations , construction of bonded and non- bonded laboratory and duties to be paid for manufacturing of alcoholic preparations and export of alcoholic preparations in bond and outside bond.
		6	Identify potential fraud and abuse legal issues of narcotic &psychotropic substances.
		7	Study the Sailent Features of Drugs and magic remedies Act and its rules and gain information on prohibited and exempted advertisements.
		8	Understand about the regulations pertaining to drug price control order and describe about the sale price of bulk drugs and retail price of formulations.
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Medicinal Chemistry (Theory)	T3105		**Upon completion of the course student will be able to**
		1	Understand the concept of advanced techniques in the drug discovery, CADD, QSAR and cobinatorial chemistry.
		2	Gain knowledge in the medicinal chemistry of Anti-infective agents.
		3	Acquire knowledge about sulphonamides, classification, structures, SAR, therapeutic uses and synthesis.
		4	Acquire knowledge in the classification, structures, SAR, therapeutic uses and synthesis of anti-malarial, and antibacterials.
		5	Acquire knowledge in the classification, structures, SAR, therapeutic uses and synthesis of antibiotics.
		6	Gain knowledge in the medicinal chemistry of antineoplastic agents.
		7	Understand the etiology of various cardiac diseases and identify targets to treat them and gain knowledge on medicinal chemistry of drugs acting on cardiovascular system
		8	Acquire knowledge about Hypoglycemic agents.
		9	Gain knowledge in the medicinal chemistry of ant thyroid drugs.
		10	Gain knowledge in the medicinal chemistry of antidiabetics.
		11	Understand the importance of various diagnostic aids.
		12	Gain knowledge in the medicinal chemistry of steroidal harmones, their analogues.
Medicinal Chemistry (Practical)	T3110		**Upon completion of the course student will be able to**
		1	Carry out the synthesis of various organic intermediates containing heterocyclic rings, drugs.
		2	Analyze the purity of API and intermediates.
		3	Ascertain the knowledge on the methodology to perform QSAR
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical Formulations (Theory)	T3106		**Upon completion of the course student will be able to**
		1	Familiarize oneself with the types of various dosage forms.
		2	Grasp the formulation and quality control test and evaluation of uncoated as well as coated tablets.
		3	Become expert in production and filling of hard & soft gelatine capsules. Quality control test for Same
		4	Gain an understanding of the formulation and evaluation of semisolid preparation such as ointment, gel etc.
		5	Know inside out in the formulation concepts of pharmaceutical suspensions and emulsions and their stability problems.
		6	Acquire working knowledge and understanding the production facilities of Parenterals
		7	Become proficient in the various controlled and novel drug delivery systems and its importance
Pharmaceutical Formulations (Practical)	T3111		**Upon completion of the course student will be able to**
		1	Prepare and evaluate various solid and liquid dosage forms and demonstration of tablet coating
		2	Prepare parental formulations
		3	Formulate and evaluate semisolid dosage forms
		4	Prepare various cosmetic preparations
Pharm D IV Year			
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Pharmacotherapeutics-III (Theory)	T4101		**Upon completion of the course student will be able to**
		1	Understand the pathophysiology and pharmacotherapy of several common disease states
		2	Know The Principles of Pharmacotherapy in Particular Patients Groups.
		3	Apply knowledge and clinical skills to problem solving in unfamiliar situations.
		4	Obtain and interpret information from literature and apply this information in a clinical situation
		5	Present information on the therapeutic use of drugs to fellow students and staff in a clear and professional manner.
		6	Undertake medication reviews
			Upon completion of the course student will be able to

Pharmacotherapeutics-III (Practical)	T4107	1	Identify drug interactions and rationalize the prescription
		2	Discuss the therapeutic approach to management of selected diseases
		3	Prepare individualized therapeutic plans based on diagnosis
		4	Perform patient counseling
		5	Conduct planned experiments and prepare laboratory report in a standard forma
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Hospital Pharmacy (Theory)	T4102		**Upon completion of the course student will be able to**
		1	Know various drug distribution methods.
		2	Know the professional practice management skills in hospital pharmacies.
		3	Provide unbiased drug information to the doctors.
		4	Know the manufacturing practices of various formulations in hospital set up.
		5	Appreciate the practice based research methods.
		6	Appreciate the Practice Based Research Methods, stores management and inventory control.
Hospital Pharmacy (Practical)	T4108		**Upon completion of the course student will be able to**
		1	Analyse prescriptions for drug interaction
		2	Formulate and prepare parenteral formulations and powders
		3	Perform inventory analysis
		4	Answer drug information queries through literature search
		5	Conduct planned experiments and prepare laboratory report in a standard format
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Clinical Pharmacy (Theory)	T4103		**Upon completion of the course student will be able to**
		1	Explain the roles and responsibilities of clinical pharmacist
		2	Analyse and interpret the laboratory test results for clinical diagnosis
		3	Conduct interview to elicit medication history and perform patient counseling
		4	Identify, monitor, assess, manage, prevent, document and report suspected adverse drug reactions
		5	Provide drug and poison information through critical analysis
		6	Recognise the potential sources of medication errors and act for its prevention
Clinical Pharmacy (Practical)	T4109		**Upon completion of the course student will be able to**
		1	Assess prescriptions for drug interaction and answer drug information query
		2	Perform patient counseling on medication and conduct medication history interview
		3	Analyse and interpret the data obtained through laboratory tests
		4	Conduct planned experiments and prepare laboratory report in a standard format
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Biostatistics & Research Methodology (Theory)	T4104		**Upon completion of the course student will be able to**
		1	Know basic research methods which are used in clinical study design that relates to experimental and observational studies, collecting data, study and analyze. Observe Errors relating experimentation
		2	Observe relation between components also measure and study linearly. We can observe one component influence with multiple factors.
		3	Understand Testing the hypothesis, how far population parameter significant based on estimator with the help of parametric tests. Non parametric tests can also observed
		4	Understand analysis of variance helps in study total variation observational data
		5	Know application of analysis in field or lab experimental to design. Factorial experiments.
		6	Know research objects about reliability and validity experimental and clinical study.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
			Upon completion of the course student will be able to
		1	Know basic concepts and factors influencing absorption, distribution and elimination of drugs.
		2	Understand various pharmacokinetic models used in calculating various pharmacokinetic parameters
		3	Study the pharmacokinetic parameters of drugs administered through intravenous bolus and infusion routes that follows one compartment open model

Biopharmaceutics &Pharmacokinetics (Theory)	T4105	4	Determine the pharmacokinetic parameters of drugs administered through intravenous bolus and infusion routes that follows two compartment open model.
		5	Understand the concept of multiple dosage regimen and determine pharmacokinetic parameters of drugs administered through intravenous bolus, infusion and oral routes.
		6	Understand the non-linear pharmacokinetic model and its parameters of drugs.
		7	Determine pharmacokinetic parameters by using non-compartmental model
		8	Understand basic concepts, estimation and factors influencing bioavailability and bioequivalence of drugs.
Biopharmaceutics & Pharmacokinetics (Practical)	T4110		**Upon completion of the course student will be able to**
		1	Enhance dissolution characteristics of slightly soluble drugs by co-solvency, solid dispersion and use of surfactant
		2	Compare dissolution studies of two different marketed products of same drug.
		3	Perform Protein binding studies of a drug and Calculation of bioavailability
		4	Calculate the Pharmacokinetic parameters like Ka, Ke, t1/2, Cmax, AUC, AUMC, MRT etc. from blood profile data.
		5	Calculate bioavailability from urinary excretion data for two drugs.
		6	Determine metabolic pathways for different drugs based on elimination kinetics data
		7	Perform absorption studies in animal inverted intestine using various drugs.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Clinical Toxicology (Theory)	T4106		**Upon completion of the course student will be able to**
		1	Demonstrate an understanding of the roles of various health care personnel in the prevention and management of poisonings
		2	Demonstrate an understanding of the health and economic implications of toxic exposures
		3	Demonstrate and apply an understanding of general toxicology principles and clinical management practice
		4	Demonstrate and apply an understanding of the history, assessment, and therapy considerations associated with the management of a toxic exposure
		5	Demonstrate and apply an understanding of the characteristics of and treatment guidelines for specific toxic substances
		6	Propose several preventive approaches to reduce unintentional poisonings
		7	Enable the pharmacist to function as contributing health care team member when faced with a toxic exposure experience, including emergencies.
Pharm D V Year			
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Clinical Research (Theory)	T5101		**Upon completion of the course student will be able to**
		1	Understand new drug development process
		2	Understand clinical studies scenario in Indian and other countries
		3	Understand the regulatory and ethical requirement in clinical trails
		4	Know the role and responsibilities of clinical trial personnel
		5	Know the designing of clinical trial documents
		6	Manage the clinical trial coordination process
		7	Know safety monitoring and reporting in clinical trails
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmacoepidemiology and Pharmacoeconomics (Theory)	T5102		**Upon completion of the course student will be able to**
		1	Compare and contrasts different study designs.
		2	Distinguish methods of data collection and recording.
		3	Understand issues involved in selecting sample and recruiting participants.
		4	Discuss threats to validity and issues of interpretations
		5	Discuss applications of pharmacoepidemiological concepts and methods to pharmacy practice.
		6	Explain measures of disease occurrence and association.
		7	Demonstrate knowledge and understanding of statistical theory.
		8	Select and apply appropriate statistical techniques for managing common types of medical data.
		9	Interpret correctly the results of statistical analyses
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
			Upon completion of the course student will be able to

Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring	T5103	1	Apply PK-PD principles in cases using patient data to optimize pharmacotherapy and drug dosing for maximal efficacy and minimal toxicity.
		2	Recognise, document and manage drug dosing in cases involving significant patient pharmacokinetic variability due to physiology or disease (eg age, obesity, pregnancy, malabsorption, organ dysfunction, critical illness, therapeutic target site).
		3	Recognize, characterize and manage cases with clinically significant PK-PD drug interactions.
		4	Demonstrate appropriate therapeutic drug management (TDM) in cases with medications for which concentrations can be measured or predicted from available PK research data
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Clerkship	T5104		**Upon completion of the course student will be able to**
		1	Discuss the role of Pharmacist in clinical pharmacy services
		2	Demonstrate the skills of a clinical Pharmacist
		3	Discuss the available therapeutic options in the management of diseases
		4	Prepare a pharmaceutical care plan for a given case
		5	Detect ,Interpret and report medication errors and drug interactions
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Project Work	T5105		**Upon completion of the course student will be able to**
		1	Address a problem related to Pharmacy practice in hospital, community service or clinical set up with a wider perspective and generality
		2	Address a problem related to Pharmacy practice in hospital, community service or clinical set up with a wider perspective and generality
		3	Define the problem to be addressed and translate it into a statement of aim, objectives, scope and plan for the project
		4	Carry out and report an information survey and take account of findings in executing project
		5	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
		6	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
		7	Present a coherent, logically argued, fully referenced report and engage in a professional manner in a viva-voce discussion about the project drug

M.Pharmacy

Pharmaceutics I Semester (PCI Regulation)

Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Modern Pharmaceutical Analytical Techniques (Theory)	MPH101T		**Upon completion of the course student will be able to**
		1	Understand the UV-Visible spectroscopy, IR, flame and atomic absorption spectroscopy.
		2	Know principles of NMR spectroscopy, instrumentation and applications.
		3	Understand the principles of mass spectroscopy, different ionization techniques and applications of mass spectroscopy.
		4	Understand the different chromatographic techniques like paper, ion exchange, gas, HPLC, etc
		5	Know the principles and procedures of paper and capillary electrophoresis; XRD and its applications.
		6	Understand the principles and procedures of immunoassays like radioimmunoassay, ELISA and bioluminescent assays.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
			Upon completion of the course student will be able to
		1	Understand drug delivery system give a detailed information transporting a pharmaceutical compound in the body as needed to safely achieve its desired therapeutic effect.
		2	Understand approaches, formulations, technologies, and systems for transporting a pharmaceutical compound in the body as needed to safely achieve its desired therapeutic effect with suitable drug delivery.

Drug Delivery System (Theory)	MPH102T	3	Know methods of manufacture and evaluation of various Sustained Release (SR) and Controlled Release (CR) formulations like Gastroretentive, Baccal, Transdermal and Occular drug delivery systems.
		4	Understand recent developments in protein and peptide for parenteral delivery approaches will give new dimension of drug deliver for antibiotics, insulin, etc.
		5	Understand vaccine delivery and different mode of application approach for clinical use. They know the different types of Drug carrier used in the process of drug delivery which serves to improve the selectivity, effectiveness, and/or safety of drug administration.
		6	Know the latest drug delivery knowledge and think to develop new formulation based on the individual requirement.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Modern Pharmaceutics (Theory)	MPH103T		**Upon completion of the course student will be able to**
		1	Learn about the science behind performing a Preformulation study before formulating a novel drug delivery system.
		2	Understand the current good manufacturing practices that are implemented in various pharmaceutical industries.
		3	Understand various validation protocols that are been followed in the pharmaceutical industries as per various regulatory guidelines.
		4	Understand various optimization techniques that are used in prior to formulate any new dosage form.
		5	Understand how to run the optimization softwares (For ex: Design expert and Minitab).
		6	Understand about the science between compaction and compression of a tablet.
		7	Understand about various dissolution parameters that have to be incorporated while performing dissolution studies.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Regulatory Affairs (Theory)	MPH104T		**Upon completion of the course student will be able to**
		1	Identify the concepts of innovator and generic drugs and drug development process.
		2	Describe the regulatory guidances and guidelines for filing and approval process.
		3	Detail the preparation of dossiers and their submission to regulatory agencies in different countries.
		4	Identify the post approval regulatory requirements for actives and drug products.
		5	Express the submission of global documents in CTD/eCTD formats.
		6	Define the clinical trials for approvals for conducting clinical trials.
		7	Describe the pharmacovigilence and process of monitoring in clinical trials.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmaceutics Practical I (Practical)	MPH105PA		**Upon completion of the course student will be able to**
		1	Know Variability and Operation of commonly used analytical instruments like UV Vis spectrophotometer, HPLC, Gas Chromatography, Fluorimetry and Flame photometry.
		2	Perform Analysis of various drugs and their formulation in single and combination dosage forms.
		3	Have knowledge as well as hands on training with respect to the principles of formulation science such as Preformulation studies and Micromeritics.
		4	Possess the knowledge about effect of compressional force on tablets Properties.
Pharmaceutics Practical II (Practical)	MPH105PB		**Upon completion of the course student will be able to**
		1	Get knowledge with respect to composition of dosage forms, selection of drugs and polymers for the development of delivering system
		2	Formulate and evaluation of various customized, Sustained Release (SR) and Controlled Release (CR) formulations.
		3	Formulate and evaluate various novel drug delivery systems: Floating DDS, Muco adhesive tablets and Trans dermal patches
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Seminar/Assignment			**Upon completion of the course student will be able to**
		1	Improve Oral and written communication skills.
		2	Explore an appreciation of theself in relation to its larger diverse social and academic contexts.
		3	Understand and discuss current, real-world issues
		4	Introduce to different types of scholarly sources and how to access them
		5	Provide with preliminary skills to do further research in the field of international relations

		6	Know how to break down a piece of writing into its component parts and analyze the arguments
		7	Give the opportunity to read in depth on a topic and understand how different pieces of scholarship are engaged in conversation with one another.
Pharmaceutics II Semester			
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Molecular Pharmaceutics (Nano Tech and Targeted DDS) (Theory)	MPH201T		**Upon completion of the course student will be able to**
		1	Understand the various approaches for development of novel drug delivery systems like Tumor targeting and Brain specific delivery.
		2	Understand the criteria for selection of drugs and polymers for the development of NTDS
		3	Know the need, concept, design and evaluation of various targeted drug delivery systems like Nano Particles, Liposomes, Niosomes, Aquasomes, Phytosomes, Electrosomes and Monoclonal Antibodies.
		4	Understand gene therapy and different mode of application approach for clinical use.
		5	Understand the formulation and evaluation of Aerosols and Intra Nasal Route Delivery systems.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Advanced Biopharmaceutics & Pharmacokinetics (Theory)	MPH202T		**Upon completion of the course student will be able to**
		1	Understand the basic concepts in biopharmaceutics and pharmacokinetics
		2	Understand the use of raw data and derive the pharmacokinetic models and parameters that best describe the process of drug absorption, distribution, metabolism and elimination. Describe various pharmacokinetic parameters by using various mathematical models.
		3	Know the critical evaluation of biopharmaceutic studies involving drug product equivalency
		4	Understand the design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters
		5	The potential clinical pharmacokinetic problems and application of basics of pharmacokinetic
		6	Understand the basic concepts of BA/BE studies and in-vitro -in-vivo correlations (IVIVC)
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Computer Aided Drug Delivery System (Theory)	MPH203T		**Upon completion of the course student will be able to**
		1	Explain about the role of computers in pharmaceutical research, various modelling approaches and parameters used in modelling.
		2	Understand about basics and guidelines of Quality by Design (QbD)
		3	Understand about computation modelling techniques of ADME process for a drug
		4	Understand about the concept of optimization and they can design a formulation of emulsion and microemulsion using softwares like design expert.
		5	Understand about legal aspects involved in using computers in pharmaceutical research
		6	Understand about using of computer aided designs in in-vitro dissolution studies.
		7	Understand about usage of computers in stimulating whole organisms and tissues.
		8	Understand the regulations involved in clinical data collection and management.
		9	Understand about current status of pharmaceutical automation and its future trends
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Formulation Development of Pharmaceutical and Cosmetic Products (Theory)	MPH204T		**Upon completion of the course student will be able to**
		1	Learn about the science behind performing a Preformulation study before formulating a novel drug delivery system.
		2	Learn about various pre-formulation parameters that have to be studied before formulating a novel drug delivery system.
		3	Learn about basics and recent developments in excipient science.
		4	Learn about the importance of solubility for a drug and methods to enhance the solubility.
		5	Learn about basics of drug dissolution and various parameters involved in in vitro drug dissolution studies.
		6	Know about the standard stability testing procedures for formulated dosage forms using ICH guidelines.
		7	Understand about basics and legal aspects of cosmeticology and various formulations like dentifrices, lipsticks, nail polish and baby products etc.

Course	Course Code	Course Outcome Number	Course Outcome
Pharmaceutics Practical III (Practical)	MPH205PA		**Upon completion of the course student will be able to**
		1	Know the effect of temperature, non solvent, incompatible polymer addition on preparation of microcapsules.
		2	Design and perform in-vitro evaluation studies for various novel drug delivery systems: Alginate beads, gelatin /albumin microspheres, liposomes / niosomes and spherules.
		3	Perform in-vitro dissolution of marketed products and interpretation of dissolution data.
		4	Calculate the various pharmacokinetic parameters of drugs and pharmaceutical products in animal models / Software.
Pharmaceutics Practical IV (Practical)	MPH205PB		**Upon completion of the course student will be able to**
		1	Learn how to use the Design Expert Software in the formulation design and data analysis.
		2	Calculate the various pharmacokinetic and pharmacodynamics parameters using Computer Simulations / Computational Modeling.
		3	Formulate and evaluate various cosmetic products and Multi Vitamin Syrup.
		4	Know the optimization techniques in Formulation Development of Tablets.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Seminar/Assignment			**Upon completion of the course student will be able to**
		1	Improve Oral and written communication skills.
		2	Explore an appreciation of theself in relation to its larger diverse social and academic contexts.
		3	Understand and discuss current, real-world issues
		4	Introduce to different types of scholarly sources and how to access them
		5	Provide with preliminary skills to do further research in the field of international relations
		6	Know how to break down a piece of writing into its component parts and analyze the arguments
		7	Give the opportunity to read in depth on a topic and understand how different pieces of scholarship are engaged in conversation with one another.
PHARMACEUTICAL ANALYSIS SEMESTER I			
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Modern Pharmaceutical Analytical Techniques (Theory)	MPA101T		**Upon completion of the course student will be able to**
		1	Understand the UV-Visible spectroscopy, IR, flame and atomic absorption spectroscopy.
		2	Know principles of NMR spectroscopy, instrumentation and applications.
		3	Understand the principles of mass spectroscopy, different ionization techniques and applications of mass spectroscopy.
		4	Understand the different chromatographic techniques like paper, ion exchange, gas, HPLC, etc
		5	Know the principles and procedures of paper and capillary electrophoresis; XRD and its applications.
		6	Understand the principles and procedures of potentiometry and thermal analytical techniques like DSC and TGA.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Advanced Pharmaceutical Analysis (Theory)	MPA102T		**Upon completion of the course student will be able to**
		1	Know about impurities classification, residual solvents classification and limits.
		2	Understand the classification of elemental impurities, factors affecting stability and stability commitment
		3	Understand accelerated stability studies, stability zones, photostability testing and stability of biological products.
		4	Understand the regulatory requirements and HPTLC fingerprinting.
		5	Know bioassays of vaccines and PCR instrumentation
		6	Understand the principles and procedures of different immunoassays.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical Validation (Theory)	MPA103T		**Upon completion of the course student will be able to**
		1	Understand introduction of Qualification and Validation involving Validation Master Plan, DQ, IQ, OQ, PQ, RQ, FAT, SAT.
		2	Know qualification of analytical instruments and glassware
		3	Know Advanced Validation of Utility Systems (Water, HVAC, Compressed air and Nitrogen) and Cleaning Validation.

		4	Know Analytical Method Validation according to USP and ICH guidelines.
		5	Understand Rigorous detailing of General principles of Intellectual Property.
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Food Analysis (Theory)	MPA104T		**Upon completion of the course student will be able to**
		1	Learn about the flavor studies and to detect spoilage of food.
		2	Understand the advanced analytical methods for estimation of concentration of carbohydrates, vitamins, fats, amino acids, proteins in food.
		3	Understand the process of determining nutritional quality
		4	Know very well about Chromatography techniques like GC-MS,LC- MS,Electrophoresis,HPLC,HPTLC,SFC, HPCPC, RIA,ELISA in analysis of food adulterants.
		5	Understand how to select a suitable analytical method for qualitative and quantitative analysis of a pesticide residues in food substance.
		6	Know about the use of BIS MARK, AGMARK on food substances.
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical Analysis Practical I (Practical)	MPA105PA		**Upon the completion of the course student will be able to perform**
		1	Calibration of glasswares and pH meter
		2	Calibration of UV-Visible spectrophotometer and FTIR spectrophotometer
		3	Calibration of GC and HPLC
		4	Cleaning validation of any one equipment and Imupurity profiling of drugs
		5	Assay of official compounds by different titrations and instrumental techniques
		6	Estimation of riboflavin/quinine sulphate by fluorimetry; Estimation of sodium/potassium by flame photometry
		7	Quantitative determination of hydroxyl group and amino group, and Colorimetric determination of drugs by using different reagents
Pharmaceutical Analysis Practical II (Practical)	MPA105PB		**Upon completion of the course student will be able to**
		1	Learn about the determination of total reducing sugar, proteins, vitamins content in foods
		2	Determine the saponification value, Iodine value, Peroxide value, Acid value of food products.
		3	Understand the selection of analytical methods for analysis of synthetic colors in food products
		4	Know very well about determination of concentration of preservatives and pesticides residue in food products
		5	Understand the selection of various analytical methods for determining food additives
		6	Determine density and specific gravity of food substances.
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Seminar/Assignment			**Upon completion of the course student will be able to**
		1	Improve Oral and written communication skills.
		2	Explore an appreciation of theself in relation to its larger diverse social and academic contexts.
		3	Understand and discuss current, real-world issues
		4	Introduce to different types of scholarly sources and how to access them
		5	Provide with preliminary skills to do further research in the field of international relations
		6	Know how to break down a piece of writing into its component parts and analyze the arguments
		7	Give the opportunity to read in depth on a topic and understand how different pieces of scholarship are engaged in conversation with one another.
PHARMACEUTICAL ANALYSIS SEMESTER II			
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Advanced Instrumental Analysis (Theory)	MPA201T		**Upon completion of the course student will be able to**
		1	Understand the basic principles of HPLC and applications of HPLC.
		2	Understand the chromatographic techniques like size exclusion, ion exchange, ion pair, affinity, gas and HPTLC.
		3	Know basic concepts about SFC, CE and CE-MS hyphenation.
		4	Understand the principles of mass spectroscopy, different ionization techniques, mass analysers and MS/MS systems.
		5	Understand the NMR spectroscopy, 2D NMR techniques and LC-NMR hyphenation
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
			Upon completion of the course student will be able to
		1	Perform extraction of drugs and metabolites from biological samples and validation of bio-analytical methods

Modern Bio-Analytical Techniques (Theory)	MPA202T	2	Know factors affecting bioavailability, transport models and permeability methods.
		3	Understand drug interactions, microsomal assays and toxicokinetics; and applications of LC-MS in bioactivity screening and proteomics.
		4	Know cell culture techniques, cell viability assays and flow cytometry.
		5	Expalin Metabolite identification by microsomal approaches and drug product performance
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Quality Control and Quality Assurance (Theory)	MPA203T		**Upon completion of the course student will be able to**
		1	Understand concepts of QC/QA, GLP, ICH Guidelines Q-Series. Purchase specifications, selection of vendors and maintenance of stores
		2	Know cGMP guidelines in accordance to USFDA including CDER, CBER, PIC, WHO, EMEA for industrial management and CPCSEA guidelines.
		3	Understand detailed analysis of raw materials, IPQC, finished products and developing specifications according to ICH Q6 and Q3.
		4	Know characteristic documentation in pharmaceutical industry
		5	Understand clear perspective of manufacturing operations and controls.
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Herbal and Cosmetic Analysis (Theory)	MPA204T		**Upon completion of the course student will be able to**
		1	Learn about the Quality control of crude drugs
		2	Understand the advanced analytical methods for estimation of adulterants and deterioration of herbal drugs
		3	Understand the process of detection of herbal drugs and monographs of herbal dugs
		4	Know very well about herbal drug- drug interactions
		5	Know about the evaluation of cosmetic products
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical Analysis Practical III (Practical)	MPA205PA		**Upon completion of the course student will be able to**
		1	Know comparison of absorption spectra by UV and Wood ward – Fiesure rule and Interpretation of organic compounds by FT-IR
		2	Know Interpretation of organic compounds by NMR and MS
		3	Understand determination of purity by DSC in pharmaceuticals and Identification of organic compounds using FT-IR, NMR, CNMR and Mass spectra
		4	Perform bio molecules separation utilizing various sample preparation techniques and quantitative analysis of components by gel electrophoresis and HPLC techniques
		5	Perform Isolation of analgesics from biological fluids (Blood serum and urine).
		6	Know protocol preparation and performance of analytical / bioanalytical method validation, and protocol preparation for the conduct of BA/BE studies according to guidelines
Pharmaceutical Analysis Practical IV (Practical)	MPA205PB		**Upon completion of the course student will be able to**
		1	Perform in process and finished product quality control tests for tablets, capsules, parenterals and creams
		2	Perform quality control tests for primary and secondary packing materials, and assay of raw materials
		3	Know testing of related and foreign substances in drugs and raw materials, and preparation of Master Formula Record and Batch Manufacturing Record
		4	Perform quantitative analysis of rancidity in lipsticks and hair oil, and determination of aryl amine content and Developer in hair dye
		5	Know determination of foam height and SLS content of Shampoo, and determination of total fatty matter in creams
		6	Know determination of acid value and saponification value, and determination of calcium thioglycolate in depilatories
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Seminar/Assignment			**Upon completion of the course student will be able to**
		1	Improve Oral and written communication skills.
		2	Explore an appreciation of theself in relation to its larger diverse social and academic contexts.
		3	Understand and discuss current, real-world issues
		4	Introduce to different types of scholarly sources and how to access them
		5	Provide with preliminary skills to do further research in the field of international relations
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		7	Give the opportunity to read in depth on a topic and understand how different pieces of scholarship are engaged in conversation with one another.
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
			M.Pharm III SEMESTER
search Methodology and Biostatist		1	Understand the concepts of Reaeserch and types of study designs
	MRM301T	2	Summarize the concepts of Sampling techniques and hypothetical calculations
		3	Discuss the concepts of values in medical ethics
		4	Understand the concepts of CPCSEA and SOPS's
		5	Summarize the principles and Declarations of Helsinki

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