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

PROGRAM SPECIFIC OUTCOMES B. PHARMACY	
PSO 1:	Graduates will have a theoretical and practical understanding of all core and supplementary pharmaceutical sciences subjects, including drug delivery systems, routes of administration of different drugs, their mechanisms of action, chemistry, drug doses, patient treatment & counseling, drug dispensing, hospital & clinical pharmacy, quality control, quality assurance, and regulation.
PSO 2:	Graduates will be able to use their knowledge of cell and molecular biology, synthetic and macromolecular chemistry, chemical and biomedical engineering, materials science, anatomy, physiology and pharmacology, clinical research, biopharmaceutics, pharmacovigilance and pharmacoeconomics in the diagnosis, prevention and treatment of various diseases.
PSO 3:	Graduates will use their preparation and analytical abilities experience to meet industrial needs.
PSO 4:	Graduates will use their understanding of drug regulations to expand their businesses and promote the distribution of all scheduled drugs and cosmetics.

PROGRAM SPECIFIC OUTCOMES M. PHARMACY	
PSO 1:	Graduates will learn in-depth information on drug design, action, delivery and analysis in drug development & research.
PSO 2:	Graduates will be able to adhere to worldwide guidelines and pharmacopoeial standards to emphasize the value of quality control and assurance in drug analysis and formulation development.
PSO 3:	Graduates will acquire comprehensive details on preclinical and clinical research, regulatory requirements and pharmacovigilance of target pharmaceuticals and cosmetics with a focus on safety, efficacy & stability.
PSO 4:	Graduates will develop and analyze innovative drug delivery systems by creating, choosing, and using appropriate resources, such as modern molecular and IT technologies.

Program Name	Course Code	Course Name	CO No.	Course Outcome Upon completion of the course, the learner shall be able to:
B. PHARM SEM I	BP101T	Human Anatomy and Physiology I Theory	B101T.1	Explain how the separate systems interact to yield integrated physiological responses.
			B101T.2	Apply detailed concepts related to integumentary, skeletal, body fluids, lymphatic, special senses, peripheral nervous & cardiovascular system to novel technical and/or clinical scenarios.
			B101T.3	Critically interpret how different physiological systems of the body function with its mechanisms.
	BP102T	Pharmaceutical Analysis I – Theory	B102T.1	Recognize and explain the fundamental concepts and tenets behind different analytical techniques of pharmaceutical analysis in order to specify the concentration, it's calculation, preparation and standardization of pharmaceutical substances.
			B102T.2	Apply the principles of titrimetric and gravimetric techniques while analyzing drugs and to illustrate the methods of conductometry, potentiometry and polarography and how they are used to analyze drugs for maintaining its purity and standards.
			B102T.3	Point out causes of errors that frequently occur during pharmaceutical analysis along with indicators used and offer solutions to overcome errors.
	BP103T	Pharmaceutics I – Theory	B103T.1	Elucidate historical development of profession of pharmacy & pharmacopoeia in India
			B103T.2	Comprehend the concepts of prescription, posology, pharmaceutical incompatibility and pharmaceutical calculations
			B103T.3	Classify and describe the formulation and evaluation of powder, liquid & semisolid dosage forms

B. PHARM SEM I	**BP104T**	**Pharmaceutical Inorganic Chemistry – Theory**	B104T.1	Explain the basic fundamental principles of Pharm. Inorganic Chemistry and provide the updated knowledge of sources and determination of impurities in pharmaceutical substances and communicate in public for better health of society.
			B104T.2	Categorize and analyze the role of ions in human physiology and monographs of inorganic compounds with its pharmaceutical and medicinal importance useful to health care professionals.
			B104T.3	Summarize the different aspects of radiopharmaceuticals and its pharmaceutical applications associated with environmental sustainability
	BP105T	**Communication skills – Theory**	B105T.1	Understand the communication and its process, they will be identify barriers and how perception influences communication. Furthermore, they will learn how to communicate effectively face-to-face and use non-verbal communications
			B105T.2	Improve basic listening skill and to identify situations in which written communication is appropriate and comprehend the challenges of effective writing.
			B105T.3	Enables students to prepare and structure effective presentations, deliver them confidently, and overcome their fear of public speaking. They will also learn interview tips and practice effective communication skills in group discussions.
	BP106RBT	**Remedial Biology**	B106T.1	Identify the living world and morphology of different parts of flowering plants
			B106T.2	Summarize functions of cells and organs in CVS, Digestive, Respiratory, Excretory, Nervous, Endocrine and Reproductive system
			B106T.3	Elaborate the physiology, nutritional requirement for plants and animals

B. PHARM SEM1	BP106RMT	Remedial Mathematics – Theory	B106RMT.1	Know the theory and their application in Pharmacy
			B106RMT.2	Solve the different types of problems by applying theory
			B106RMT.3	Appreciate the important application of mathematics in Pharmacy
	BP107P	Human Anatomy and Physiology – Practical	B107P.1	Demonstrate the principle and working of various instruments used in Human Anatomy & Physiology.
			B107P.2	Identify microscopic features of various types of cells and tissues as well as gross anatomy and physiology of various bones.
			B107P.3	Perform hematological tests and also record Blood Pressure, heart rate & pulse rate.
	BP108P	Pharmaceutical Analysis I – Practical	B108P.1	Perform titrimetric analysis and limit tests to ascertain the purity of given pharmaceutical sample and operate equipment instruments required for the pharmaceutical analysis of given samples.
			B108P.2	Formulate and standardize primary and secondary standard solutions and estimate normality of a solution by analytical methods.
			B108P.3	Prepare students with formulas and calculations involved during pharmaceutical analysis.
	BP109P	Pharmaceutics I – Practical	B109P.1	Recall the principles used in the preparation of solid, liquid and semi solid dosage forms.
			B109P.2	Experiment with monophasic & biphasic liquid dosage forms for internal and external administration.
			B109P.3	Design powders and granules, semi solid dosage forms & suppositories.

B. PHARM SEM I	**BP110P**	**Pharmaceutical Inorganic Chemistry – Practical**	B110P.1	Update the basic practical knowledge of Pharmaceutical Inorganic chemistry and Analyze; identify the Inorganic compounds qualitatively associate with good laboratory practices.
			B110P.2	Plan and prepare medicinally important inorganic compounds associate in safely handling of chemicals for environment sustainability.
			B110P.3	Analyze levels of impurities in inorganic compounds as per Pharmacopoeial standards and confirm the purity of Inorganic compounds by its physical and chemical properties.
	BP111P	**Communication skills – Practical**	B111P.1	Emphasise the key elements of skilled written communication required for professional success with effective presentations and to acquire confidence in facing job interviews
			B111P.2	Students should be able to apply verbal and nonverbal communication techniques in a professional environment, as well as promote optimism and self-confidence.
			B111P.3	Gain knowledge, abilities, and judgment in human communication that will help them work productively with others
	BP112RBP	**Remedial Biology – Practical**	B112RBP.1	Explain techniques for handling microscope and preparation of permanent slides, ultra structure of cells and bones, and discuss anatomy & physiology of frog using computer models
			B112RBP.2	Examine and summarize morphology and microscopy of stem, root, leaf, seed, fruit, flower and their modifications
			B112RBP.3	Evaluate physiological parameters like blood group, blood pressure, tidal volume

Program Name	Course Code	Course Name	CO No.	Course Outcome
B. PHARM SEM II	BP201T	Human Anatomy and Physiology II – Theory	B201T.1	Explain the gross morphology, anatomy and physiology of various systems of the human body.
			B201T.2	Summarize how the separate systems interact to yield integrated physiological responses.
			B201T.3	Predict factors or situations affecting various organ systems that could disrupt homeostasis and the types of problems that would occur in the body if various organ systems could not maintain homeostasis and allowed regulated variables (body conditions) to deviate from normal.
	BP202T	Pharmaceutical Organic Chemistry I – Theory	B202T.1	Provide the basic and updated knowledge needed in the area of Pharm. Organic Chemistry associated withthe classification, IUPAC nomenclature, Isomerism and drawing the structure of organic compound.
			B202T.2	Summarize the methods of preparation and analyze the reaction kinetics, Orientation, reactivity and stability of organic compound from its structure and functional group.
			B202T.3	Apply the contextual knowledge of different uses of organic compound to assess public health and safety benefits.
	BP203T	Biochemistry – Theory	B203T.1	Illustrate the chemistry and biological significance of biological macromolecules along with fundamentals of bioenergetics and biological oxidation
			B203T.2	Explain the metabolism of nutrient molecules in physiological and pathological conditions and catabolic processes that occur with respect to carbohydrates, lipids, amino acids etc.
			B203T.3	Classify enzymes, their functions, mechanism and factors that influence their action, and relate the structure of DNA with its function in replication and gene expression with organization of mammalian genome

B. PHARM SEM II	**BP204T**	**Pathophysiology – Theory**	B204T.1	Explain basic principles involved in cell injury, cellular adaptations, apoptosis, inflammation and healing, atherosclerosis and disturbances of homeostasis like pH and electrolyte imbalances
			B204T.2	Summarize the etiopathogenesis and clinical manifestations of Cardiovascular, Respiratory, Renal, Hematologic, Gastrointestinal, Nervous, Endocrine, Integumentary, Neoplastic and Infectious Disorders
			B204T.3	Identify and differentiate diagnostically relevant clinical complications of Cardiovascular, Respiratory, Renal, Hematologic, Gastrointestinal, Nervous, Endocrine, Integumentary, Neoplastic and Infectious Disorders
	BP205T	**Computer Applications in Pharmacy – Theory**	B205T.1	Ability to understand, classify and utilize computers, recognize different input and output devices, and illustrate how a computer's numerical system works.
			B205T.2	Apply basic learning and assessment for designing and development of databases and websites using HTML, XML, CSS.
			B205T.3	Integrate and effectively use computers in all pharmacy-related tasks such as drug information services, pharmacokinetics, mathematical model in drug design, preclinical development etc.
			B205T.4	Understand about bioinformatics and their impact in vaccine discovery.
	BP206T	**Environmental sciences – Theory**	B206T.1	Understand multidisciplinary nature of environmental studies
			B206T.2	Acquire skills to help the concerned individuals in identifying and solving environmental problems
			B206T.3	Describe Environmental Pollution: Air pollution; Water pollution; Soil pollution

B. PHARM SEM II	BP207P	Human Anatomy and Physiology II – Practical	B207P.1	Describe anatomy & physiology of various organ systems with special reference to vital organs & gonads.
			B207P.2	Perform and interpret general neurological examinations to assess the physiology and functions of olfactory, hypoglossal, optic nerves and central as well as spinal reflexes
			B207P.3	Evaluate respiratory, metabolic and hematologic parameters of human body & relate the condition with clinical significance
	BP208P	Pharmaceutical Organic Chemistry I– Practical	B208P.1	Update the basic practical knowledge of Pharmaceutical Organic Chemistry and analyze, identify Organic compounds qualitatively associate with good laboratory practices.
			B208P.2	Plan and prepare solid derivatives of Organic compound associate within safely handling of chemicals for environment sustainability.
			B208P.3	Construct different molecular models of organic compounds by using modern tools.
	BP209P	Biochemistry – Practical	B209P.1	Elaborate the principles and Qualitative analysis of Carbohydrates & proteins.
			B209P.2	Examine and identify the variables influencing enzyme activity and interpret the correlation of concentration of proteins or carbohydrates to optical density.
			B209P.3	Analyze physiological and pathological components of urine and formulate buffer solutions with defined pH.
	BP210P	Computer Applications in Pharmacy – Practical	B210P.1	Demonstrate and make use of MS Word, for designing questionnaire for diseases and labels as well as HTML to create web page to show personal information
			B210P.2	Utilization of online tools, to gather more information about such a medicine and its adverse effects.
			B210P.3	Create, design and generate database by using MS Access which can be exported into html and xml format and this may be implemented in numerous pharmaceutical specialties

Program Name	Course Code	Course Name	CO No.	Course Outcome
B. PHARM SEM III	BP301T	Pharmaceutical Organic Chemistry II – Theory	B301T.1	Explain methods of preparations, reactions, properties, mechanism, aromaticity, stability and uses of different organic compounds.
			B301T.2	Illustrate the different analytical constants of fats and oils and evidences in derivation of structure of Benzene.
			B301T.3	Analyze effect of different substituents on orientation, reactivity and properties of organic compounds.
	BP302T	Physical Pharmaceutics I – Theory	B302T.1	Acquire detail knowledge on different types of states of matter and solubility, as well as how to utilize them in the development of drugs and drug delivery systems.
			B302T.2	Demonstrate the basic principles of adsorption, solubilization and differentiate type of interfaces by applying relevant examples from pharmaceutical sciences.
			B302T.3	Describe, characterize, and distinguish the different forms of complexes and how they relate to drug action and protein binding and also acquire skills and working knowledge of the principles and concepts of pH buffers
	BP303T	Pharmaceutical Microbiology – Theory	B303T.1	Learn about bacteriology and animal cell culture comprising understanding of methods of cultivation, isolation, identification, processing & storage of microorganisms and application of animal cell culture in production of Bio similar
			B303T.2	Get expertise in sterilization includes methods, principle and instrumentation & sterility testing of various pharmaceutical products according to official pharmacopoeias.
			B303T.3	Acquire knowledge of bioassay & microbial spoilage, assessment of microbial contamination, spoilage and preservation of pharmaceutical products
	BP304T	Pharmaceutical Engineering – Theory	B 304T.1	Know various unit operations used in Pharmaceutical industries.
			B 304T.2	Understand the material handling techniques which is used in pharmaceutical Industry.
			B 304T.3	Perform various processes involved in pharmaceutical manufacturing Unit.

B. PHARM SEM III	BP305P	Pharmaceutical Organic Chemistry II – Practical	B305P.1	Explain principle, reaction, mechanism, procedure and uses of synthesis and analytical constant determination
			B305P.2	Perform synthesis, recrystallization and analytical constant determination of different organic compounds
			B305P.3	Analyze the percentage yield and analytical constant of the given organic compounds
	BP306P	Physical Pharmaceutics I – Practical	B306P.1	Acquire skills and working knowledge of the principles and concepts of phase diagram
			B306P.2	Perform, determine and analyze the physical parameters such as solubility, surface tension, partition coefficient, and pKa in dosage form design.
			B306P.3	Analyze the drug complexes by various methods an interpret the data
	BP307P	Pharmaceutical Microbiology – Practical	B307P.1	Learn preparation & maintenance of class 100 area, personal hygiene & sterilization of glassware, nutrition media for conductance of microbiology experiments aseptically.
			B307P.2	Acquire abilities of handling different equipment used in microbiology practical Sterilization
			B307P.3	After completion of the course student will be able To implement different techniques for isolation of micro-organisms from various substances & to identify various types of micro-organisms
			B307P.4	Analyzing and solving the microbial analytical issue of various samples like water, Pharmaceutical dosage forms etc.
	BP 308P	Pharmaceutical Engineering – Practical	B308P.1	Know various unit operations used in Pharmaceutical industries.
			B308P-2	Understand the material handling techniques which is used in pharmaceutical Industry
			B308P.3	Perform various processes involved in pharmaceutical manufacturing Unit

Program Name	Course Code	Course Name	CO No.	Course Outcome
B. PHARM SEM IV	BP401T	Pharmaceutical Organic Chemistry III– Theory	B401T.1	Explain the stereo-chemical aspects of optical isomerism Geometrical, Conformation and atropisomerism.
			B401T.2	Describe the methods of preparation, properties, reactions, mechanism and application of heterocyclic compound.
			B401T.3	Discuss the principal, properties, reaction, mechanism and application of synthetically important reactions.
	BP402T	Medicinal Chemistry I – Theory	B402T.1	Explain history, fundamental concepts, classification, distribution and actions related to receptors and drugs.
			B402T.2	Describe SAR, structure, IUPAC name, properties, mechanism of action, uses, adverse effects, synthesis and metabolism of different medicinal compounds, Hormones or neurotransmitters.
			B402T.3	Analyze therapeutic and adverse effect of different medicinal compounds.
	BP403T	Physical Pharmaceutics II – Theory	B403T.1	Study physicochemical properties of drug and the flow behavior of fluid, deformation of solids.
			B403T.2	Describe various chemical and kinetic properties of system and explain the different reaction kinetics i.e. Zero, first and second order.
			B403T.3	Estimation of derived properties of powders and Compile the stability data for determination of expiry date of pharmaceutical drug products.
	BP404T	Pharmacology I – Theory	B404T.1	Classify drugs acting on various organ system on the basis of its therapeutic use
			B404T.2	Describe concept of pharmacology, pharmacodynamics and pharmacokinetics of drugs and steps and regulations concerned with drug discovery and clinical evaluation of new drugs
			B404T.3	Illustrate pharmacological effects, mechanism of action, indications, contraindications and adverse effects of drugs, pharmacological understanding in the averting and treatment of a variety of diseases

B. PHARM SEM IV	**BP405T**	**Pharmacognosy and Phytochemistry I– Theory**	B405T.1	Describe the development and scope of pharmacognosy and describe the chemical properties, applications, and evaluation of crude medications.
			B405T.2	Describe the cultivation, collection and preparation of medications with natural sources and describe the role of herbal medicines and of marine drugs in conventional medical practices.
			B405T.3	Describe Plant tissue culture, types of medicinal system and Primary metabolides
	BP406P	**Medicinal Chemistry I – Practical**	B406P.1	Explain principle reaction, mechanism, procedure and uses in relation with synthesis, assay and determination of partition coefficient of different drugs.
			B406P.2	Perform synthesis, assay and determination of partition coefficient of different drugs.
			B406P.3	Analyze results of the synthesis, assay and determination of partition coefficient of different drugs.
	BP407P	**Physical Pharmaceutics II – Practical**	B407P.1	Know the principle of separation method & calculate particle size by sieving, microscopic method.
			B407P.2	Study different technique for measurement of viscosity and Characterize the derived properties of powder
			B407P.3	Analyze the reaction rate constant of first andsecond order and construct the accelerated stability data.
	BP408P	**Pharmacology I – Practical**	B408P.1	Describe use of various animals in laboratory experiment for evaluation of pharmacological activities and as per CPCSEA guideline
			B408P.2	Demonstrate different routes of administration and common laboratory techniques for the animal studies, principle and procedures of various instruments /apparatus used in experimental pharmacology.
			B408P.3	Interpret effect of drug on animal testing model based on simulated models.
	BP409P	**Pharmacognosy and Phytochemistry I – Practical**	B409P.1	Demonstrate chemical tests to identify unorganized crude drugs and evaluate the quality and purity of crude drugs
			B409P.2	Perform linear measurements for crude drug identification
			B409P.3	Develop quality control methods for standardization of herbal drugs

Program Name	Course Code	Course Name	CO No.	Course Outcome
B. PHARM SEM V	BP501T	Medicinal Chemistry II – Theory	B501T.1	Explain fundamental concepts, classification, distribution and actions related to receptors and drugs.
			B501T.2	Describe SAR, structure, IUPAC name, properties, and mechanism of action, uses, adverse effects, synthesis and metabolism of different medicinal compounds, Hormones or neurotransmitters.
			B501T.3	Compare therapeutic and adverse effect of different medicinal compounds.
	BP502T	Industrial Pharmacy I– Theory	B502T.1	Understand the dosage forms such as tablets and capsules its design, formulation strategies, concept of mechanisms and packaging
			B502T.2	Describe formulation development, manufacturing, excipients used and evaluation of pellets, suspension, emulsion and semisolid dosage forms
			B502T.3	Outline formulation, manufacturing, environmental processing, validation, packaging of parenteral and ophthalmic dosage form
	BP503T	Pharmacology II – Theory	B503T.1	Classify the anti-inflammatory agents, drugs acting on Urinary, Cardiovascular and Endocrine system.
			B503T.2	Illustrate the pharmacology of autacoids, anti-inflammatory agents, drugs acting on Urinary, Cardiovascular and Endocrine system.
			B503T.3	Compare the bioassay of various drugs.
	BP504T	Pharmacognosy and Phytochemistry II– Theory	B504T.1	Emphasizes on basic metabolic pathways, techniques employed in the elucidation of biosynthetic pathway and formation of different secondary metabolites through these pathways.
			B504T.2	Describes the source, chemistry and analysis secondary metabolites.
			B504T.3	Describes the source, chemistry and Production therapeutic/commercial applications of secondary metabolites.
	BP405T	Pharmacognosy and Phytochemistry I– Theory	B405T.1	Describe the development and scope of pharmacognosy and describe the chemical properties, applications, and evaluation of crude medications.
			B405T.2	Describe the cultivation, collection and preparation of medications with natural sources and describe the role of herbal medicines and of marine drugs in conventional medical practices.
			B405T.3	Describe Plant tissue culture, types of medicinal system and Primary metabolides

B. PHARM SEM V	BP505T	Pharmaceutical Jurisprudence – Theory	B505T.1	Inculcate in students the ability to practice the code of pharmaceutical ethics and understand the various domains of the pharmaceutical legislation in India and its scope.
			B505T.2	Acquaint the students with the regulatory bodies monitoring Pharmacy education in India; various administrative authorities and agencies governing import, manufacture, distribution and sale of pharmaceuticals and to maintain standards and quality of drug product.
			B505T.3	study of various forensic laws with its objectives like Drug and Cosmetics Act 1940, Medical Termination Of Pregnancy Act 1971 and rules there under 1975, Narcotic and Psychotropic Substances Act 1985, Poisons Act 1919, Drug Price Control Order 1995, Medicinal and Toilet Preparations Act, Drug and Magic Remedies 1954,1955 etc
	BP506P	Industrial Pharmacy I – Practical	B506P.1	Perform preformulation, preparation and evaluation of tablets, capsules and liquid dosage forms
			B506P.2	Understand formulation of cosmetics and packaging material sciences
			B506P.3	Knowledge on sterile product preparation, tablet coating and its evaluation
	BP507P	Pharmacology II – Practical	B507P.1	Describe the analgesic, anti-inflammatory and diuretic activity, In vitro Pharmacology, Physiological salt solution, effects of spasmogens and spasmolytics using rabbit jejunum as well as effects of drugs on blood pressure and heart rate of dog.
			B507P.2	Apply the appropriate method and procedure to carry out bioassay of various drugs.
			B507P.3	Interpret the bioassay of various dugs, pA_2, pD_2 Value as well as effects of drugs on isolated frog heart.
	BP508P	Pharmacognosy and Phytochemistry II – Practical	B508P.1	Identify crude drugs by morphological and microscopical characteristics
			B508P.2	Isolate phytoconstituents from crude drugs and Perform Paper and Thin Layer Chromatography
			B508P.3	Carry out chemical tests for the identification of unorganized crude drugs

Program Name	Course Code	Course Name	CO No.	Course Outcome
B. PHARM SEM VI	BP601T	Medicinal Chemistry III – Theory	B601T.1	Discuss the nomenclature, Classification, SAR, MOA, metabolism, synthesis, uses and adverse effect of antibiotics, anti-tubercular and antiviral, antifungal, antibacterial, antimalarial and antiprotozoal drugs
			B601T.2	Describe the basic concept and applications of prodrug
			B601T.3	Illustrate the importance of drug design and different techniques of drug design.
	BP602T	Pharmacology III – Theory	B602T.1	Classify chemotherapeutic agents, drugs for respiratory & gastrointestinal tract diseases as well as immunostimulants and immunosuppressants.
			B602T.2	Illustrate the pharmacology of chemotherapeutic agents, drugs acting on immune system drugs used in the management of respiratory and gastrointestinal tract diseases. chronopharmacology
			B602T.3	Compare the clinical symptoms and management of various poisoning as well as acute, sub acute and chronic toxicity.
	BP603T	Herbal Drug Technology – Theory	B603T.1	Describe the WHO guidelines for Good agricultural and collection practices of herbal raw material.
			B603T.2	Describe tradition system of medicine, benefits of various plants as nutraceuticals in ailments, herb-food interaction of various plant drugs and benefits of herbal cosmetics.
			B603T.3	Discuss WHO and ICH guidelines for the assessment of herbal drugs.
	BP604T	Biopharmaceutics and Pharmacokinetics – Theory	B604T.1	Explain and recall basic concepts in biopharmaceutics and pharmacokinetics also discuss, analyze their significance.
			B604T.2	Demonstrate the plasma drug concentration for construction of pharmacokinetic model , development of relation, analyze & interpretation of pharmacokinetic parameter
			B604T.3	Outline & relate concepts of bioavailability and bioequivalence of drug products to identify, categorize and to prove bioequivalence.

B. PHARM SEM VI	**BP605T**	**Pharmaceutical Biotechnology– Theory**	B605T.1	Study fundamental principles of biotechnology in the field of genetic engineering, medicine and fermentation technology ultimately will comprehend the many methods employed in contemporary biotechnology.
			B605T.2	Acquire scientific knowledge of production of monoclonal antibody, bio-similar, transgenic (genetically modified) crops and animals, also various pharmaceuticals using microorganisms and mammalian cells.
			B605T.3	Gain knowledge about the evolution of the immune system, the structural characteristics of its components, and the procedures by which our body produces an immunological response. It will assist students in making predictions about the type of immune response that arises in response to bacterial, viral, or parasite infection and supporting those predictions with innovative experimental designs.
	BP606T	**Quality Assurance– Theory**	B606T.1	Explain fundamental knowledge about GMP and cGMP
			B606T.2	Understand validation and calibration of instruments in industry
			B606T.3	Learn importance of QA and QC departments in pharmaceutical industry.
	BP607P	**Medicinal chemistry III – Practical**	B607P.1	Plan and synthesize medicinally important compounds by conventional and microwave method.
			B607P.2	Utilize drug design tools software to assertion the physicochemical characteristics of substance
			B607P.3	Determine the percentage yield purity of some pharmaceuticals by assay or by Method ,construct the structure reaction of medicinally important drugs by chem draw software
	BP608P	**Pharmacology III – Practical**	B608P.1	Describe the antiallergic, anti-ulcer, hypoglycemic activity, dose calculation, pyrogen testing as well as effect of drugs on gastrointestinal motility, guinea pig ileum and frog intestine.
			B608P.2	Explain the acute skin and eye irritation/corrosion test, acute oral toxicity test.
			B608P.3	Interpret serum biochemical parameters, pharmacokinetic parameters and bio statistical methods in experimental pharmacology.
	BP609P	**Herbal Drug Technology – Practical**	B609P.1	Prepare herbal formulations and herbal cosmetics using standardized extracts
			B609P.2	Evaluate excipients of natural origin
			B609P.3	After undergoing this course students will be able carryout monograph analysis of herbal drugs determine alcohol content, aldehyde content, total alkaloids and phenol

Program Name	Course Code	Course Name	CO No.	Course Outcome
B. PHARM SEM VII	BP701T	Instrumental Methods of Analysis – Theory	B701T.1	Learn about the interaction of matter with electromagnetic radiations as well as with present other solvents for drugs as well as related problems analysis.
			B701T.2	Fully comprehend concepts of Spectroscopic methods and Chromatographic techniques for analysis purpose.
			B701T.3	Recall use of various modern tools for analysis of organic, inorganic, and natural products. Also upgrade with advanced technology for better outcomes.
	BP702T	Industrial Pharmacy II – Theory	B702T.1	Discuss the process of pilot plant scale up of pharmaceutical dosage forms.
			B702T.2	Demonstrate the practice and the process of technology transfer from lab scale to commercial.
			B702T.3	Explain the different laws and acts that regulate pharmaceutical industry.
	BP703T	Pharmacy Practice – Theory	B703T.1	Define various terminologies used in the pharmacy practice
			B703T.2	Illustrate the organizational structure, classification, functions and policies (including formularies) of hospitals and pharmacy organizations, distribution, use and monitoring of drug, clinical interpretations, Patient counseling and pharmacy management.
			B703T.3	Describe the personnel and their responsibilities in hospital and pharmacy organizations, importance of drug information services, education and training programmes in hospitals and the role of pharmacist in pharmacy stores management, inventory control, Budget preparation, adverse drug reactions, community pharmacy
	BP704T	Novel Drug Delivery System – Theory	B704T.1	Understand various approaches and applications for development of Novel Drug Delivery Systems
			B704T.2	Discuss and study oral, mucosal, dermal, pulmonary and nasal drug delivery systems over conventional dosage forms for prolonged action
			B704T.3	Illustrate the principles and fundamentals of drug targeting in the design of site-specific drug delivery system
	BP705 P	Instrumental Methods of Analysis – Practical	B705P.1	Fully comprehend concepts of modern tools for evaluation, separation and analysis purpose.
			B705P.2	Analyze drugs quantitatively and qualitatively using various analytical modern tools.
			B705P.3	Demonstrate proficiency in the use of various analytical modern.

Program Name	Course Code	Course Name	CO No.	Course Outcome
B. PHARM SEM VIII	BP801T	Biostatistics and Research Methodology – Theory	B801T.1	Understand the fundamental concepts of statistics and to draw graphs and plots based on type of data
			B801T.2	Apply probability, regression, hypothesis while using statistical tools to analyse data
			B801T.3	Recognize the purpose of research, its methods, and its uses, as well as to explain experimental design in research.
	BP802T	Social and Preventive Pharmacy – Theory	B802T.1	Review Concept of health And examine general principles of prevention and control of various diseases.
			B802T.2	Facilitate information about various National health programs and understand objectives and outcome of the program
			B803T.3	Access and manage Community services in rural, urban and school health.
	BP805ET	Pharmacovigilance – Theory	B805ET.1	Describe History, development, Pharmacovigilance Program of India (PvPI), vaccine safety surveillance, various terminologies used in Pharmacovigilance, significance of drug safety monitoring and evaluation of Medicine and in pediatrics, geriatrics, pregnancy and lactation and in special population respectively, WHO international drug monitoring program, Pharmacogenomics of adverse drug reactions.
			B805ET.2	Categorize methods for safety data generation of drugs life cycle at the phases of pre-clinical, clinical and post approval stages, drugs on the basis of anatomical, chemical and therapeutic use, drug dictionaries and coding, Pharmacovigilance methods, adverse drug reactions and its reporting systems and communication in Pharmacovigilance.
			B805ET.3	Discuss Pharmacovigilance planning, expedited reporting, CIOMS requirements for ADR reporting, ICH guidelines for ICSR, PSUR
	BP811ET	Advanced Instrumentation Techniques – Theory	B811ET.1	Understand about the interaction of matter with electromagnetic radiations, as well as the challenges that arise as a result of this interaction in drug analysis.
			B811ET.2	Completely comprehend the concept of modern technologies as well as the calibration of advanced analytical modern instruments.
			B811ET.3	Recall the use of numerous modern tools for organic, inorganic, and natural product analysis, such as NMR, MASS spectroscopy, Thermal analysis, XRD, RIA, Extraction techniques, and Hyphenated techniques. Upgrade utilizing advanced technologies in order to achieve excellent outcomes.

B. PHARM (SUK) SEM III	2.3.1	Physical Pharmacy – I	B2.3.1T.1	Investigate and apply various theories, laws and equations related to different states of matter.
			B2.3.1T.2	Demonstrate use of physicochemical properties of drugs in the formulation development and evaluation of dosage forms.
			B2.3.1T.3	Understand solubility of drugs, diffusion principles, phase rule and applications of distribution law.
	2.3.2	Pharmaceutical Microbiology & Immunology	B2.3.2T.1	Study microbiology comprising history, classification, & taxonomy of micro-organisms also understanding of methods of cultivation, isolation, identification, processing & storage of microorganisms (Bacteria, Virus & Yeast, Fungi & rickettsia)
			B2.3.2T.2	Get expertise in sterilization including methods, principle and instrumentation & sterility testing of various pharmaceutical products according to official pharmacopoeias.
			B2.3.2T.3	Gain knowledge about the evolution of the immune system, the structural characteristics of its components, and the procedures by which our body produces an immunological response.
	2.3.3	Pharmaceutical Biochemistry	B2.3.3 T.1	Illustrate the chemistry and biological significance of biological macromolecules along with fundamentals of bioenergetics and biological oxidation
			B2.3.3 T.2	Explain the metabolism of nutrient molecules in physiological and pathological conditions and catabolic processes that occur with respect to carbohydrates, lipids, amino acids etc.
			B2.3.3 T.3	Classify enzymes, their functions, mechanism and factors that influence their action, and relate the structure of DNA with its function in replication and gene expression with organization of mammalian genome
	2.3.4	Pharmacognosy & Phytochemistry – II	B2.3.4T.1	Study of drug containing volatile oil, resin, Tanins, fibres etc.
			B2.3.4T.2	Explain Phytochemical screening of plant extract
			B2.3.4T.3	Describes pharmaceutical aids & technical products

B. PHARM (SUK) SEM III	2.3.5	**Biostatistics and Computer applications**	B2.3.5 T.1	Ability to understand, classify and utilize computers, recognize different input and output devices, and illustrate how a computer's numerical system works.
			B2.3.5 T.2	Apply basic learning and assessment for designing and development of databases and websites using HTML, XML, CSS.
			B2.3.5 T.3	Integrate and effectively use computers in all pharmacy-related tasks such as drug information services, pharmacokinetics, mathematical model in drug design, preclinical development etc.
	2.3.6	**Physical Pharmacy – I (Practical)**	B2.3.6P.1	Apply the knowledge of physical properties of drug molecules & understand the phenomenon of partition coefficient and surface tension
			B2.3.6P.2	Understand the concept of solubility and recognize basic rules and equations regarding physical principles.
			B2.3.6P.3	Apply the knowledge of ionic equilibria, adsorption isotherms & chemical kinetics.
	2.3.7	**Pharmaceutical Microbiology & Immunology (Practical)**	B2.3.7P.1	Acquire abilities of handling different equipments used in microbiology practical also to learn preparation & maintenance of class 100 area, personal hygiene & sterilization of glassware for conductance of microbiology experiments aseptically
			B2.3.7P.2	After completion of the course student will be able to implement different techniques for isolation of micro- organisms from various substances & to identify various types of micro-organisms
			B2.3.7P.3	Learn microbial analysis of air, water & pharmaceutical samples also serological analysis of micro-organism.
			B2.3.7P.4	Learn evaluation of antimicrobial agent/ disinfectants
	2.3.8	**Pharmaceutical Biochemistry (Practical)**	B2.3.8P.1	Elaborate the principles and Qualitative analysis of Carbohydrates & proteins.
			B2.3.8P.2	Examine and identify the variables influencing enzyme activity and interpret the correlation of concentration of proteins or carbohydrates to optical density.
			B2.3.8P.3	Analyze physiological and pathological components of urine and formulate buffer solutions with defined pH.

B. PHARM (SUK) SEM III	**2.3.9**	**Pharmacognosy & Phytochemistry – II (Practical)**	B2.3.9P.1	Identify crude drugs by morphological and microscopical characteristics
			B2.3.9P.2	Isolate phytoconstituents from crude drugs and Perform Paper and Thin Layer Chromatography
			B2.3.9P.3	Carry out chemical tests for the identification of unorganized crude drugs
	2.3.10	**Biostatistics and Computer applications (Practical)**	B2.3.10 P.1	Demonstrate and make use of MS Word, for designing questionnaire for diseases and labels as well as HTML to create web page to show personal information
			B2.3.10 P.2	Utilization of online tools, to gather more information about such a medicine and its adverse effects.
			B2.3.10 P.3	Create, design and generate database by using MS Access which can be exported into html and xml format and this may be implemented in numerous pharmaceutical specialties

Program Name	Course Code	Course Name	CO No.	Course Outcome
B. PHARM (SUK) SEM IV	2.4.1	Physical Pharmacy – II	B2.4.1T.1	Student's are able to assess the states of matter, surface area & understand the surface tension and interfacial phenomenon.
			B2.4.1T.2	Understand the particle size, shape and surface area & physics of particles and rheology.
			B2.4.1T.3	Describe drug stability & study of dispersed systems.
	2.4.2	Pharmaceutical Biotechnology	B2.4.2T.1	Study fundamental principles of biotechnology in the field of genetic engineering, medicine and fermentation technology ultimately will comprehend the many methods employed in contemporary biotechnology.
			B2.4.2T.2	Execute future prospects of biotechnology by applying knowledge in production of therapeutic proteins, biosimillars, transgenic (genetically modified) crops and animals, also various pharmaceuticals using microorganisms and mammalian cells.
			B2.4.2T.3	Gain knowledge of production of various immunological products including vaccines sera, allergic extracts, diagnostics and biological.
	2.4.3	Pharmaceutical Heterocyclic & Polycyclic Chemistry	B2.4.3T.1	Explain the stereo-chemical aspects of optical isomerism Geometrical, Conformation and atropisomerism
			B2.4.3T.2	Describe the methods of preparation, properties, reactions, mechanism and application of heterocyclic compound.
			B2.4.3T.3	Discuss the principal, properties, reaction, mechanism and application of synthetically important reactions.
	2.4.4	Pharmaceutical Chemistry	B2.4.4T.1	Explain Introduction, Definition, Classification and applications of different phytoconstituents and other compounds
			B2.4.4T.2	Describe Properties, Isolation, synthesis structure illucidation of phytoconstituents and other compounds.
			B2.4.4T.3	Illustrate Stereochemical aspects of different organic compounds.
	2.4.5	Pharmacology – I	B2.4.5T.1	Explain the basic of drug discovery and development stages.
			B2.4.5T.2	Describe the basic of general pharmacology.
			B2.4.5T.3	Illustrate pharmacology of drug acting on Autonomic nervous system.

B. PHARM (SUK) SEM IV	**2.4.6**	**Physical Pharmacy – II (practical)**	B2.4.6 P.1	Gain the knowledge of particle size analysis and surface, interfacial tension & HLB determination methods.
			B2.4.6 P.2	Determination of particle size & viscosity of solid & liquid.
			B2.4.6 P.3	Apply the knowledge of dispersed systems by various methods.
	2.4.7	**Pharmaceutical Biotechnology (practical)**	B2.4.7P.1	Study standardization of water and antibiotics
			B2.4.7P.2	Execute preparation of callus culture & isolation of genetic material from plant cells.
			B2.4.7P.3	Practical execution of production of secondary metabolite from plant cells
			B2.4.7P.4	Practical implementation of method of isolation of proteins, enzymes by various method such as gel electrophoresis, entrapment, adsorption method
	2.4.8	**Pharmaceutical Heterocyclic & Polycyclic Chemistry (practical)**	B2.4.8P.1	Explain principle, reaction, mechanism, procedure, uses of synthesis, analytical constant and functional group determination
			B2.4.8P.2	Perform synthesis, recrystallization, analytical constant and fuctional group determination of different organic compounds
			B2.4.8P.3	Analyze the percentage yield, analytical constant and Functional group determination of the given organic compounds
	2.4.9	**Pharmaceutical Chemistry (practical)**	B 2.4.9P.1	Explain principle, reaction, procedure, mechanism and application of extraction, identification test, Estimation of functional groups and titrimetric analysis of phytoconstituents and biomolecules.
			B 2.4.9P.2	Perform extraction, identification test, Estimation of functional groups and titrimetric analysis of phytoconstituents or biomolecules.
			B 2.4.9P.3	Analyze extraction, identification test, Estimation of functional groups and titrimetric analysis of phytoconstituents and biomolecules
	2.4.10	**Pharmacology – I (practical)**	B2.4.10P. 1	Explain the CPCSEA guidelines for handling, root of administration, blood withdrawal from laboratory animals.
			B2.4.10P. 2	Demonstrate the effect of drugs on rabbit eyes and frog esophagus.
			B2.4.10P. 3	Comprehend the absorption and bioavailability, protein binding, urinary excretion, antioxidant activity of given drug.

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B. PHARM (SUK) SEM V	3.5.1	Cosmeticology	B3.5.1T.1	Comprehend basic knowledge of cosmetic preparations and its physiological considerations while developing applications
			B3.5.1T.2	Learn the concepts of excipients and their selection for development of cosmetics and various sensitivity and irritation tests used for colours
			B3.5.1T.3	Learn various appropriate formulation manufacturing and evaluation methods for cosmetics used for skin, hair, nail, eye, and aerosols
	3.5.2	Pharmaceutical Engineering	B3.5.2T.1	Learn scientific principles regarding fluids and their handling
			B3.5.2T.2	Know various preventive methods used for corrosion control in pharmaceutical industries. Also learn concepts of maintenance and safety during operations.
			B3.5.2T.3	Know the principle, construction, working, uses, advantages and disadvantages of Pharmaceutical equipments used for various unit operations
	3.5.3	Medicinal Chemistry – I	B3.5.3T.1	Explain history, fundamental concepts, classification, distribution and actions related to receptors and drugs.
			B3.5.3T.2	Describe SAR, structure, IUPAC name, properties, mechanism of action, uses, adverse effects, synthesis and metabolism of different medicinal compounds, Hormones or neurotransmitters
			B3.5.3T.3	Compare therapeutic and adverse effect of different medicinal compounds.
	3.5.4	Pharmaceutical Polymer Chemistry	B3.5.4T.1	Describe basic concepts and pharmaceutical uses of polymers and nitrogeneous bases.
			B3.5.4T.2	Classify pharmaceutical excipients, lipids, carbohydrates with their general chemistry and structure property relationship
			B3.5.4T.3	Classify and describe natural pigments with their examples

B. PHARM (SUK) SEM V	3.5.5	Pharmacology – II	B3.5.5T.1	Elaborate and summaries principles of cell injury, inflammation and adaptation as a basis for etiopathology of diseases
			B3.5.5T.2	Construct and utilize pharmacological profile of different diuretics and emphasize their utility in edematous and non-edematous state.
			B3 .5.5T.3	Prepare and apply an algorithm for treatment of various cardiovascular disorders and autacoid mediated pathological conditions.
	3.5.6	Cosmeticology (Practical)	B3.5.6P.1	Impart practical preparative skills of cosmetic formulations for skin their quality control tests
			B3.5.6P.2	Learn practical knowledge of cosmetic formulations for hair with their evaluation parameters
			B3.5.6P.3	Gain practical hands-on experience of cosmetic formulations for eye and nail with their evaluation parameters
	3.5.7	Medicinal Chemistry – I (Practical)	B3.5.7P.1	Explain principle, reaction, mechanism, procedure & uses of synthesize of different medicinal compounds.
			B3.5.7P.2	Perform & report synthesis of different medicinal compounds.
			B3.5.7P.3	Analyse percentage yeild of different synthesized compounds.
	3.5.8	Pharmaceutical Polymer Chemistry (Practical)	B3.5.8P.1	Estimate ester value, saponification value, acid value of a given natural oil
			B3.5.8P.2	Practice paper and thin layer chromatographic techniques and explain its applications
			B3.5.8P.3	Identify protein and amino acid from natural crude powder and execute extraction procedures for natural compounds.
	3.5.9	Pharmacology – II (Practical)	B3.5.9P.1	Describe the different nobel laureates in the field of medicine and physiology and their contribution and ECG recordings from given data
			B3.5.9P.2	Demonstrate the different instruments and effect of different drugs on experimental animals by using simulation
			B3.5.9P.3	Determine the biological parameters from given biological samples

Program Name	Course Code	Course Name	CO No.	Course Outcome
B. PHARM (SUK) SEM VI	3.6.1	Pharmaceutical Technology – II	B3.6.1T.1	Understand the tablet, capsule and microencapsulation and its design, formulation strategies, packaging of dosage form
			B3.6.1T.2	The need, design, development and evaluation of several sustained and controlled release dosage forms
			B3.6.1T.3	Apply knowledge into practice and create new pilot layout techniques
	3.6.2	Pharmaceutical Unit Operations	B3.6.2T.1	Explain various unit operations in the design and manufacture of dosage forms and describe preventive measures of corrosion and concept of fluid flow
			B3.6.2T.2	Discuss about various material handling systems.
			B3.6.2T.3	Write about humidity, air-conditioning, refrigeration and automated process control systems.
			B3.6.2T.4	Employ correct material in construction of pharmaceutical plant and comply GLP, GMP and OECD guidelines in lab or pilot plant to avoid the accidental situations, biological and environmental hazards.
	3.6.3	Medicinal Chemistry – II	B3.6.3T.1	Explain history, fundamental concepts, classification, distribution and actions related to receptors and drugs.
			B3.6.3T.2	Describe SAR, structure, IUPAC name, properties, mechanism of action, uses, adverse effects, synthesis and metabolism of different medicinal compounds, Hormones or neurotransmitters.
			B3.6.3T.3	Compare therapeutic and adverse effect of different medicinal compounds.
	3.6.4	Pharmaceutical Analysis – III	B3.6.4.T.1	Understanding of basic principle of spectroscopical methods like UV-Vis, IR, NMR, Mass etc.
			B3.6.4.T.2	Application of data for interpretation of structure.
			B3.6.4.T.3	Importance of spectroscopy for estimation of different components from the formulations.

B. PHARM (SUK) SEM VI	3.6.5	Pharmacology – III	B3.6.5T.1	Elaborate and decipher the currently updated concepts of innate and adaptive immunity and related immunologic disorders including organ transplant rejection and role of immunostimulats and immunomodulators in safe and effective prevention and treatment of these diseases so as to formulate strategies for public awareness regarding allergic and related health hazards of drugs and chemicals including environmental pollutants
			B3.6.5T.2	Understand and apply the updated factual and conceptual knowledge of thyroid disorders, diabetes, impotence and infertility and detailed pharmacological profiles of drugs used in their treatment so as to counsel patients of various socioeconomic and occupational backgrounds in dealing with these diseases and formulate data collection strategies to provide inputs for dosage form innovations and research personnel
			B3.6.5T.3	Generate updated understanding of Pharmacological basis of principles of chemotherapy of infections and cancer, microbial resistance and clinical profiles of various categories of antimicrobial and anticancer drugs with special emphasis on choice of antimicrobials and anticancer drugs so for formulating an understanding of strategies to curb antimicrobial resistance without their overzealous use and conveying these issues to patients while counseling so as to improve their quality of life
	3.6.6	Pharmacognosy & Phytochemistry - III	B3.6.6T.1	Describe cultivation, collection, commercial varieties, and Biosynthetic pathway and identification test of glycosides.
			B3.6.6T.2	Describe alternative system of medicine and explain ayurvedic preparation
			B3.6.3T.3	Describes the source, chemistry, chemical test and uses of tradition crude drugs.
	3.6.7	Pharmaceutical Technology – II (Practical)	B3.6.7P.1	Prepare and evaluate tablets and capsules dosage forms
			B3.6.7P.2	Understand formulation of oral sustained and controlled release formulation
			B3.6.7P.3	Able to create label to meet regulatory criteria

B. PHARM (SUK) SEM VI	**3.6.8**	**Pharmaceutical Unit Operations (Practical)**	B3.6.8P.1	Know various unit operations used in pharmaceutical industries
			B3.6.8P.2	Determine the varoius parameters & influence of drying & distillation
			B3.6.8P.3	Experimental illustration of size reduction & mixing by using various principles & energy laws
	3.6.9	**Medicinal Chemistry – II (Practical)**	B3.6.9P.1	Explain principle reaction, mechanism, procedure and uses in relation with synthesis, Partition Coefficient, Dissociation Constant, Molar Refractivity of Compounds for QSAR analysis. And determination of partition coefficient of different drugs.
			B3.6.9P.2	Perform and report synthesis, Partition Coefficient, Dissociation Constant, Molar Refractivity of Compounds for QSAR analysis. and determination of partition coefficient of different drugs.
			B3.6.9P.3	Analyse results of the synthesis, Partition Coefficient, Dissociation Constant, Molar Refractivity of Compounds for QSAR analysis. and determination of partition coefficient of different drugs.
	3.6.10	**Pharmaceutical Analysis – III (Practical)**	B3.6.10P.1	Calibration of various analytical and spectroscopical instruments.
			B3.6.10P.2	Develop skill for handling of instruments like UV, Flame and IR.
			B3.6.10P.3	Design of experiment by using UV, IR etc and estimate quantitatively drugs from the formulations.
	3.6.11	**Pharmacognosy & Phytochemistry - III (Practical)**	B3.6.11P.1	Identify crude drugs by morphological and microscopical characteristics.
			B3.6.11P.2	Carry out chemical tests for the identification of crude drugs
			B3.6.11P.3	Describe standardization of traditional drug formulation

Program Name	Course Code	Course Name	CO No.	Course Outcome
B. PHARM (SUK) SEM VII	4.7.1	Biopharmaceutics & Pharmacokinetics	B4.7.1T.1	Study the detail concepts of biopharmaceutics and pharmacokinetics.
			B4.7.1T.2	Discuss the ADME parameters and BE-BA concepts.
			B4.7.1T.3	Comparative study of one compartment and multicompartment modeling.
	4.7.2	Medicinal Chemistry – III	B4.7.2.T.1	Explain history, fundamental concepts, classification, distribution and actions related to receptors, vitamins and drugs.
			B4.7.2.T.2	Describe SAR, structure, IUPAC name, properties, reaction, mechanism of action, uses, adverse effects, synthesis and metabolism of different medicinal compounds, vitamins and hormones or neurotran.
			B4.7.2.T.3	Analyze therapeutic and adverse effect of different medicinal compounds.
	4.7.3	Pharmaceutical Analysis – IV	B4.7.3.T.1	Define and describe terms used in quality assurance and validation process
			B4.7.3.T.2	Classify and describe theory, instrumentation and applications of basic chromatographic tools.
			B4.7.3.T.3	Classify and describe theory, instrumentation and applications of advanced chromatographic techniques
	4.7.4	Pharmacology – IV	B4.7.4T.1	Classify drugs acting on various organ system on the basis of its therapeutic use.
			B4.7.4T.2	Explain the pharmacology of drugs acting on Central nervous system, respiratory system and gastrointestinal system; pathophysiology and pharmacotherapy of neurodegenerative, respiratory and gastrointestinal disorders.
			B4.7.4T.3	Identify the drugs used for the treatment of various diseases by referring its signs and symptoms

B. PHARM (SUK) SEM VII	**4.7.5**	**Pharmacognosy & Phytochemistry – IV**	B4.7.5T.1	Describe the advances in Pharmacognostic and phytochemical screening for alkaloidal drugs.
			B4.7.5T.2	Explain principles, types, methods and applications of plant tissue culture for secondary metabolites.
			B4.7.5T.3	Discuss aromatic plants, natural sweeteners, bitters, plant allergens, herbal health food and herbal cosmetics.
	4.7.6	**Quality assurance**	B4.7.6T.1	Acquire fundamental knowledge about GMP and cGMP
			B4.7.6T.2	Understand validation and calibration of instruments in industry
			B4.7.6T.3	Learn importance of QA and QC departments in pharmaceutical industry.
	4.7.7	**Biopharmaceutics & Pharmacokinetics (Practical)**	B4.7.7P.1	Summarize the pharmacokinetics study.
			B4.7.7P.2	Study the ADME parameters and BE-BA concepts.
			B4.7.7P.3	Comparative study of one compartment and multicompartment modeling.
	4.7.8	**Medicinal Chemistry – III (Practical)**	B4.7.8P.1	Explain principle reaction, mechanism, procedure and uses in relation with synthesis of different drugs.
			B4.7.8P.2	Perform and report percentage yield of synthesized medicinal compounds.
			B4.7.8P.3	Analyze results of synthesized medicinal compounds.
	4.7.9	**Pharmaceutical Analysis – IV (Practical)**	B4.7.9.P.1	Separate and analyze the different formulation by chromatographic technique.
			B4.7.9.P.2	Determine Rf values by using basic chromatographic techniques
			B4.7.9.P.3	Describe working of modern chromatographic techniques

B. PHARM (SUK) SEM VII	**4.7.10**	**Pharmacology – IV (Practical)**	B4710P.1	Demonstrate various pharmacological activities and effect of drugs on animal testing model by using pharmacological screening methods
			B4710P.2	Interpret serum biochemical parameters in experimental pharmacology.
			B4710P.3	Describe various instruments used in experimental pharmacology.
	4.7.11	**Pharmacognosy & Phytochemistry – IV (Practical)**	B4.7.11.P.1	Identify crude drugs by its morphology.
			B4.7.11.P.2	Apply the evaluation methods as morphology, microscopy and chemical test as a quality control tool for alkaloid containing crude drugs.
			B4.7.11.P.3	Practice the technique involved in herbal cosmetic formulation and their standardization.

Program Name	Course Code	Course Name	CO No.	Course Outcome
B. PHARM (SUK) SEM VIII	4.8.1	Pharmaceutical Technology - III	B4.8.1T.1	Outline formulation, manufacturing, environmental processing, validation, packaging of parenteral and ophthalmic dosage form
			B4.8.1T.2	Explain different blood glandular products, sutures and ligatures
			B4.8.1T.3	Understand various novel drug delivery systems and pilot plant scale up techniques in pharmacy
	4.8.2	Pharmaceutical Jurisprudence	B4.8.2T.1	Inculcate in students the ability to practice the code of pharmaceutical ethics and understand the various domains of the pharmaceutical legislation in India and its scope.
			B4.8.2T.2	Acquaint the students with the regulatory bodies monitoring Pharmacy education in India; various administrative authorities and agencies governing import, manufacture, distribution and sale of pharmaceuticals and to maintain standards and quality of drug product.
			B4.8.2T.3	Study of various forensic laws with its objectives like Drug and Cosmetics Act 1940, Medical Termination Of Pregnancy Act 1971 and rules there under 1975, Narcotic and Psychotropic Substances Act 1985, Poisons Act 1919, Drug Price Control Order 1995, Medicinal and Toilet Preparations Act, Drug and Magic Remedies 1954,1955 etc
	4.8.3	Pharmaceutical Industrial Management	B4.8.3T.1	Explain General Agreement on Tariffs and Trades and acquire Knowledge about Patent act.
			B4.8.3T.2	Understand concept of Management, PERT and CPM, material management system,production planning system,marketing in pharmaceutical industry
			B4.8.3T.3	Acquire knowledge of community pharmacy

B. PHARM (SUK) SEM VIII	4.8.4	**Medicinal Chemistry – IV**	B4.8.4T.1	Upon course completion, the students should be able to correlate the core theoretical principles of Organic, Medicinal Chemistry especially drug design aspects and Pharmacological nuances with current existing classes QSAR, Prodrugs, NSAIDs, Narcotic and Non narcotic analgesics,, Steroids, Antihistaminics, Antiemetics and anti ulcer drugs, Thyroid drugs and Oral hypogycemics
			B4.8.4T.2	The students will understand and analyse the structural aspects of drugs as well as their targets at the molecular level and to explore the drug development of classes of drugs prescribed in the subject.
			B4.8.4T.3	The students will comprehend the mechanism of physicochemical, structural and pharmacological effects exhibited by the classes of drugs prescribed in the theory course.
			B4.8.4T.4	The knowing of the side effects and adverse drug reactions of the drugs prescribed in the course will equip them with knowledge to apply it in their own life as pharmacist and for the people around them whenever their help is sought in procedural manner while serving the society as healthcare professional with a practical application of professional ethics.
			B4.8.4T.5	Through assignment such as class seminar, students will be well shaped to understand, analyse , organise the theory content and deliver it which will enable them shape their communication skill, professional identity and leadership skills with the help of modern tools.
	4.8.5	**Pharmacology – V**	B4.8.5T.1	Introduction and appliances used for bioassay, perform bioassay and DRC of different drugs
			B4.8.5T.2	Interpret serum biochemical parameters, pharmacokinetic parameters and bio statistical methods in experimental pharmacology.
			B4.8.5T.3	Comment on special instruction, any Drug interaction, prescription of pediatric/geriatric/ pregnancy and lactation

B. PHARM (SUK) SEM VIII	**4.8.6**	**Pharmaceutical Technology - III (Practical)**	B4.8.6P.1	Describe importance of air handling
			B4.8.6P.2	Formulate and evaluate parenterals and opthamic products
			B4.8.6P.3	Explain importance of primary packaging
	4.8.7	**Medicinal Chemistry – IV (Practical)**	B4.8.7P.1	The students should be able to understand and apply the fundamental principles of Organic, Analytical and Medicinal chemistry as well as be able to co relate their theory knowledge in developing practical skills during synthesis of mentioned medicinal compounds, intermediates etc
			B4.8.7P.2	Wherever applicable students should be able to use applied instruments required during the practical coursework, also learn the calibration and maintenance of the same for their effective use in analysis of synthesised molecules. They should be able to relate their experiments and the data obtained about the physicochemical properties of given drug with CADD tools and principles.
			B4.8.7P.3	The students should be enabled to know and understand the alternative synthetic routes such as green chemistry to adopt with current global needs of environmental sustainability.
	4.8.8	**Pharmacology – V (Practical)**	B4.8.8P.1	Introduction and appliances used for bioassay, perform bioassay and DRC of different drugs
			B4.8.8P.2	Interpret serum biochemical parameters, pharmacokinetic parameters and bio statistical methods in experimental pharmacology.
			B4.8.8P.3	Comment on special instruction, any Drug interaction, prescription of pediatric/geriatric/ pregnancy and lactation

Program Name	Course Code	Course Name	CO No.	Course Outcome
M. PHARM SEM I (PHARMACEUTICS)	MPH101T	Modern Pharmaceutical Analytical Techniques	M101T.1	Describe the principles, instrumentation and application of various spectroscopic and assays Techniques.
			M101T.2	Discuss the quantitative and qualitative chromatographic separation and analysis of drugs with respect to its principle and instrumentation.
			M101T.3	Illustrate the principles, instrumentation and application of electrophoresis, x ray crystallography, potentiometry and thermal techniques.
	MPH102T	Drug Delivery System	M102T.1	Basic information about its approaches, formulations, technologies, and criteria for selection of drugs and polymers systems needed for Rate controlled and SR/CR formulations.
			M102T.2	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.
			M102T.3	Recent developments in Vaccine, Protein and Peptide drug delivery system with respect to its formulation and evaluations parameters
	MPH103T	Modern Pharmaceutics	M103T.1	Understand elements of pre-formulation studies and its role in pharmaceutical product development
			M103T.2	Grasp knowledge about Industrial management and GMP considerations in pharmaceutical manufacturing
			M103T.3	Learn Optimization Techniques & Pilot Plant Scale Up Techniques along with Stability Testing, sterilization process & packaging of dosage forms.

M. PHARM SEM I (PHARMACEUTICS)	**MPH104T**	**Regulatory Affair**	M104T.1	Illustrate the concepts of innovator and generic drugs, their regulatory guidelines, scale-up & drug development process.
			M104T.2	Recognize the preparation of Dossiers, their submission to regulatory agencies in different countries & post approval regulatory requirements for actives and drug products.
			M104T.3	Explain the requirements for approvals for conducting clinical trials, monitoring of trials & pharmacovigilance.
	MPH105P	**Pharmaceutics Practical I**	M105P.1	Basic practical knowledge of all analytical instruments and their application in estimation of drug concentrations
			M105P.2	Formulations and evaluation concepts of all novel dosage forms
			M105P.3	Understand and apply the preformulation and micrometrics concept of various particle size and application in drug delivery

Program Name	Course Code	Course Name	CO No.	Course Outcome
M. PHARM SEM II (PHARMACEUTICS)	MPH201T	Molecular Pharmaceutics (Nano Tech and Targeted DDS)	M201T.1	Learn various approaches for development of novel drug delivery systems
			M201T.2	Comprehendcriteria for selection of drugs and polymers for the development of nano formulations
			M201T.3	Understand various formulation and evaluation techniques of novel drug delivery systems.
	MPH202T	Advanced Biopharmaceutics & Pharmacokinetics	M202T.1	Advanced information about bipopharmaceutics and pharmacokinetics related to drug and dosage forms
			M202T.2	Basic information related to use raw data and derive the pharmacokinetic models and parameters the best describe the process of drug absorption, distribution, metabolism and elimination.
			M202T.3	Applied knowledge about design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters and clinical application of pharmacokinetic models.
	MPH203T	Computer Aided Drug Delivery System	M203T.1	Elucidate the history of computers in pharmaceutical research and development as well as concept of optimization techniques in pharmaceutical formulations.
			M203T.2	Recognize use of computers in preclinical development& computational modeling in drug disposition.
			M203T.3	Explain computational fluid dynamics, artificial intelligence, robotics & computers in market analysis as well as clinical development.

M. PHARM SEM II (PHARMACEUTICS)	**MPH204T**	**Cosmetic and Cosmeceuticals**	M204T.1	Describe the regulatory provisions related to the import and manufacture of cosmetics as per the Drugs and Cosmetics Act 1940 and the Rules 1945
			M204T.2	Select key ingredients suitable in the formulation of various cosmetics and Describe the guidelines for the regulation of herbal cosmetics by private bodies
			M204T.3	Explain the various problems related to the skin and hair and design various cosmeceutical products
	MPH205P	**Pharmaceutics Practical II**	M205P.1	Formulations and evaluation concepts of all novel dosage forms
			M205P.2	Basic and advanced knowledge of all optimization techniques and their applications.
			M205P.3	Basic practical knowledge of all cosmetically formulations and their evaluations.

Program Name	Course Code	Course Name	CO No.	Course Outcome
M. PHARM SEM I (PHARMACEUTICAL CHEMISTRY)	MPC101T	**Modern Pharmaceutical Analytical Techniques**	M101T.1	Describe the principles, instrumentation and application of various spectroscopic and assays Techniques.
			M101T.2	Discuss the quantitative and qualitative chromatographic separation and analysis of drugs with respect to its principle and instrumentation.
			M101T.3	Illustrate the principles, instrumentation and application of electrophoresis, x ray crystallography, potentiometry and thermal techniques.
	MPC102T	**Advanced Organic Chemistry -I**	M102T.1	Discuss the mechanism, stereochemistry and applications of various named organic reactions, synthetic reagents with special emphasis on substitution and elimination reaction
			M102T.2	Explain the different organic intermediates involved in determining the reaction mechanism along with various protecting and de-protecting groups
			M102T.3	Discuss the disconnection approach to develop synthetic routes for small target molecule along with the chemistry, synthesis and mechanism of reactions in heterocyclic compounds
	MPC103T	**Advanced Medicinal chemistry**	M103T.1	Learn the different stages, techniques and strategies of drug design, discovery and development for biological targets & role of medicinal chemistry in drug research
			M103T.2	Explain the concepts of drug receptor interactions, drug resistance, prodrug development and peptidomimetics approach along with their applications
			M103T.3	Learn medicinal chemistry aspects of the important class of drugs along with types of Enzyme inhibition and its application in medicine

M. PHARM SEM I (PHARMACEUTICAL CHEMISTRY)	MPC104T	**Chemistry of Natural Products**	M104T.1	Explain the importance of natural compounds as lead molecules for new drug discovery.
			M104T.2	Elaborate isolation, purification, characterization, general methods of structural elucidation of compounds of natural origin and Explain Chemistry and Physiological significance of Vitamin
			M104T.3	Discuss rDNA technology tool for new drug discovery. Also Discuss the constituent present in crude drugs used for anti-diabetic, antitumor and liver disfunction therapy.
	MPC105P	**Pharmaceutical Chemistry Practical I**	M105P.1	Illustrate Analysis of API and their formulations by using different spectroscopic and chromatographic method.
			M105P.2	Perform synthesis, purification and characterization of compounds with known reaction rearrangement.
			M105P.3	Isolation and characterization of compounds and interpretation of UV, IR data.

Program Name	Course Code	Course Name	CO No.	Course Outcome
M. PHARM SEM II (PHARMACEUTICAL CHEMISTRY)	MPC201T	Advanced Spectral Analysis	M.201T.1	Fully comprehend concepts of UV, IR, NMR and MASS spectroscopy for interpretation of various organic compounds.
			M.201T.2	Outline the basic concept of chromatography, RIA, Thermal analysis and Raman Spectroscopy.
			M.201T.3	Recall use of various modern tool such as hyphenated instruments for analysis of organic, inorganic, and natural products.
	MPC202T	Advanced Organic Chemistry -II	M202T.1	Employ green chemistry principles and serve as an effective alternative for conventional chemistry and to use a thorough organic structure analysis.
			M202T.2	Use all catalysis in single-step and multi-step process in manufacturing of drugs and drug intermediates and also to learn more about the science of sonochemistry and chemistry of peptides.
			M202T.3	Understand stereo-chemical features including conformation and stereo electronic effects; asymmetric synthesis, reaction dynamics, and photochemical reactions.
	MPC203T	Computer Aided Drug Design	M203T.1	Design innovative drug-like compounds using a variety of molecular modelling softwares and QSAR approach.
			M203T.2	Comprehend how the QSAR, pharmacophore modelling, in silico-drug design, virtual screening techniques, and docking techniques were used in the development of novel drug candidates.
			M203T.3	Apply several software programmes for predicting physicochemical properties of molecule with special emphasis on pharmacophore concept and de novo drug design.

M. PHARM SEM II (PHARMACEUTICAL CHEMISTRY)	MPC204T	Pharmaceutical Process Chemistry	M204T.1	Understand the strategies for scale up process and impurities in the API.
			M204T.2	Illustrate the various unit operations and unit processes.
			M204T.3	Discuss the industrial safety, Hazard labels, Fire hazards, ISO-14001 and OHSAS 18000.
	MPC205P	Pharmaceutical Chemistry Practical II	M205P.1	Perform Synthesis of organic compounds by different approaches like Oxidation, Reduction/hydrogenation & Nitration and interpretation, identification of organic compounds by FT-IR, NMR, MASS spectra
			M205P.2	Preparation of different organic compounds with known reaction mechanism
			M205P.3	etermine Lipinski's rule of 5, calculation of ADMET Properties and its analysis using software and Pharmacophore modelling using 2D, 3D QSAR, docking study

Program Name	Course Code	Course Name	CO No.	Course Outcome
M. PHARM SEM I (PHARMACOLOGY)	MPL101T	Modern Pharmaceutical Analytical Techniques	M101T.1	Describe the principles, instrumentation and application of various spectroscopic and assays Techniques.
			M101T.2	Discuss the quantitative and qualitative chromatographic separation and analysis of drugs with respect to its principle and instrumentation.
			M101T.3	Illustrate the principles, instrumentation and application of electrophoresis, x ray crystallography, potentiometry and thermal techniques.
	MPL102T	Advanced Pharmacology-I	M102T.1	Discuss the pathophysiology and pharmacotherapy of different diseases
			M102T.2	Elaborate the updated information about mechanism of drug actions at cellular and molecular level so as to correlate with research problems
			M102T.3	Provide detailed mechanisms of the adverse effects, explain and correlate contraindications and clinical uses of drugs used in treatment of diseases so as to utilize them in clinical data analysis and patient counseling
	MPL103T	Pharmacological and Toxicological Screening Methods-I	M103T.1	Appraise and critically discuss the regulations and ethical requirement for the usage of experimental animals.
			M103T.2	Describe the various animals used in the drug discovery process and good laboratory practices in maintenance and handling of experimental animals so as to observe strict adherence to ethical practices in drug research and development
			M103T.3	Describe the various newer screening methods involved in the drug discovery process and correlate such preclinical data to humans

M. PHARM SEM I (PHARMACOLOGY)	MPL104T	Cellular and Molecular Pharmacology	M104T.1	Critically discuss and elaborate signal transduction mechanisms and molecular pathways affected by drugs
			M104T.2	Comprehend and utilize the applicability of molecular pharmacology and biomarkers in drug discovery process
			M104T.3	Demonstrate molecular biology techniques as applicable for Pharmacology so as to use and emphasize evidence based and ethical methods in laboratory research
	MPL105P	Pharmacology Practical I	M105P.1	Demonstrate the ability to exercise good laboratory practices during day to day laboratory work
			M105P.2	Design experimental protocols, plan experimental activity with due consideration to cost and duration and adhere to the planned protocols
			M105P.3	Demonstrate the ability to work in a research team with total dedication and commitment to social and ethical responsibilities and regional relevant health problems associated with it

Program Name	Course Code	Course Name	CO No.	Course Outcome
M. PHARM SEM II (PHARMACOLOGY)	MPL201T	Advanced Pharmacology II	M201T.1	Explain mechanism of drugs acting on Endocrine, GIT, Alzheimer, Parkinson's, Cancer and DM
			M201T.2	Describe the mechanisms at cellular and molecular level of chemotherapeutic and Immuno-pharmacological agents.
			M201T.3	Illustrate the applications of chronotherapy in CVS, DM, Asthma and Peptic ulcer as well as protective activity of antioxidants, role of free radicals in DM, Neurodegenarative diseases and cancer
	MPL202T	Pharmacological and Toxicological Screening Methods-II	M202T.1	Explain history of drug development and regulatory guidelines for toxicity studies as per OECD, ICH, EPA & Schedule Y, Principles of GLP
			M202T.2	Discuss reproductive, geno, terato, carcino, dermal, oral, inhalation toxicity as well as toxicokinetics evaluation in preclinical studies
			M202T.3	Describe studies of IND, Safety pharmacology as well as alternative methods for animal toxicity
	MPL203T	Principles of Drug Discovery	M203T.1	Demonstrate the ability to use bioinformatic, genomic and proteomic tools in drug discovery, work out experimental study design and data analysis
			M203T.2	Comprehensively discuss and analyze the process of target and lead identification, optimization and validation essential to be a part of drug research team
			M203T.3	Demonstrate the ability to use various freewares and databases involved in computer aided drug design & discovery

M. PHARM SEM II (PHARMACOLOGY)	**MPL204T**	**Clinical Research and Pharamcovigilance**	M204T.1	Demonstrate the types of clinical trial designs and Explain the regulatory requirements for conducting clinical trial
			M204T.2	Explain the responsibilities of key players involved in clinical trials and Execute safety monitoring, reporting and close-out activities
			M204T.3	Explain the principles of Pharmacovigilance, detect new adverse drug reactions and their assessment and perform the adverse drug reaction reporting systems and communication in Pharmacovigilance
	MPL205P	**Pharmacology Practical II**	M205P.1	Demonstrate good laboratory practices during laboratory work
			M205P.2	Design experimental protocols, plan experimental activity with due consideration to ethical and social requirements
			M205P.3	Perform laboratory experimental work in a research team, communicate, discuss and plan experimental work