Programme Outcomes (POs) for Degree Pharmacy	
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 well-being.
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:** 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.
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.

Program Specific Outcomes (PSOs) for Degree Pharmacy	
PSO 1.	Apply the knowledge of basic science, life sciences and fundamental process involved in pharmaceuticals.
PSO 2.	Impart theoretical & Practical knowledge among students in the various fields of pharmaceutical sciences viz., Pharmaceutics, Pharmaceutical Chemistry, Pharmacology and Pharmacognosy.
PSO 3.	Imbibe research culture amongst the students and make them competent enough to fulfill the needs of Pharmaceutical Industry.
PSO 4.	Upgrade practical skills of the students through industrial training and visits to accustom students' of working and culture of Pharmaceutical Industry.
PSO 5.	Promote the development of communication skills, leadership qualities, ethics and regulatory aspects of Pharmacy profession among the students.

Year	Semester	Course with code	Course Outcome Number	Course Outcome: Upon completion of the course, the learner shall be able to:
FIRST YEAR B. PHARMACY	Semester- I	Human Anatomy and Physiology I	101.1	Outline different levels of organization of human body.
			101.2	Explain the gross morphology, structure and functions of various organs of the human body.
			101.3	Describe the various homeostatic mechanisms and their imbalances.
			101.4	Identify the various tissues and organs of different systems of human body.
			101.5	Perform the various experiments related to special senses and nervous system.
		Pharmaceutical Analysis I	102.1	Understand the principles of volumetric and electro chemical analysis
			102.2	Carryout various volumetric and electrochemical titrations
			102.3	Develop analytical skills
			102.4	Outline the ionization, acidity, basicity and pKa of organic compounds.
			102.5	Describe the Redox titrations
		Pharmaceutics I	103.1	Summarize the history of profession of pharmacy
			103.2	Explain the basics of different dosage forms
			103.3	Interpret pharmaceutical calculations and pharmaceutical incompatibilities
			103.4	Relate the professional way of handling the prescription
			103.5	Outline the Preparation of various conventional dosage forms
		Pharmaceutical Inorganic Chemistry	104.1	Summarize importance of inorganic compounds in pharmacy
			104.2	Interpret the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals
			104.3	Understand the medicinal and pharmaceutical importance of inorganic compounds
			104.4	Explain measurements, calculations along with methods for buffers
			104.5	Describe pharmaceutical aspects of radiopharmaceuticals.
		Communication skills	105.1	Understand the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation
			105.2	Communicate effectively (Verbal and Non Verbal)
			105.3	Learn effective management of the team as a team player
			105.4	Develop interview skills.
			105.5	Inculcate the body language and personality development
		Remedial Biology	106BT.1	Know the classification and salient features of five kingdoms of life.
			106BT.2	Understand the basic components of anatomy.
			106BT.3	Describe physiology of different systems of plants
			106BT.4	Know the basic components of anatomy of animals with special reference to human body
			106BT.5	Explain physiology of different systems of animals with special reference to humans.

Year	Semester	Course with code	Course Outcome Number	Course Outcome: Upon completion of the course, the learner shall be able to:
FIRST YEAR B. PHARMACY	Semester-I	**Remedial Mathematics**	106MT.1	Know the theory and their application in Pharmacy
			106MT.2	Solve the different types of problems by applying theory
			106MT.3	Appreciate the important application of mathematics in Pharmacy
			106MT.4	Apply Analytical Geometry and calculus
			106MT.5	Use of mathematics in solving Chemical kinetics and Pharmacokinetics equations
		Human Anatomy and Physiology – Practical	107.1	Determine formed elements of blood and correlate the results with clinical conditions
			107.2	Identify locations of bone in human skeleton with their importance
			107.3	Describe body tissue and organs based on structure and organization of cells
			107.4	Compare the common diagnostic and biochemical test performed in clinical conditions and its Use in diagnosis and prognosis of diseases.
		Pharmaceutical Analysis Lab- I	108.1	Apply the concept of volumetric analysis by assay & standardization.
			108.2	Experiment with given samples for volumetric, gravimetric and solvent extraction methods.
			108.3	Utilize Pharmacopoeial monographs to evaluate pharmaceutical samples.
			108.4	Demonstrate electroanalytical methods.
		Pharmaceutics-I Practical	109.1	Relate prescription and commonly used Latin terms in pharmacy practice
			109.2	Outline roles of active and inactive ingredient required for formulation.
			109.3	Describe compounding, labeling and dispensing of extemporaneous preparations.
			109.4	Summarize patient counseling and patient education methods
		Pharmaceutical Inorganic Chemistry – Practical	110.1	Identify impurities by limit tests for inorganic ions.
			110.2	Relate identification test for inorganic substances
			110.3	Perform test for purity
			110.4	Illustrate Preparation of inorganic pharmaceuticals
		Communication skills –Practical	111.1	Understand basic communication skills.
			111.2	Relate pronunciation consonants, nouns and vowel sounds
			111.3	Illustrate advanced learning
			111.4	Summarize Interview handling and e-communication Skills
		Remedial Biology – Practical	112.1	Understand techniques of experimental biology.
			112.2	Explain structure of cell and its components.
			112.3	Determine blood group, blood pressure and tidal volume.
			112.4	Study structure and function of parts of plants and frog using suitable techniques.

Year	Semester	Course with code	Course Outcome Number	Course Outcome: Upon completion of the course, the learner shall be able to:
FIRST YEAR B. PHARMACY	Semester- II	**Human Anatomy and Physiology II (Theory)**	201.1	Explain the gross morphology, structure and functions of various organs of the human body.
			201.2	Summarize processes and part of organs in digestive system and their function.
			201.3	Relate the anatomy and physiology of urinary system.
			201.4	Outline role of hormones in the human body.
			201.5	Illustrate the different components of reproductive and nervous system.
			201.6	Explain physiological processes and mechanism for respiration.
		Pharmaceutical Organic Chemistry I – Theory	202.1	Identify type of isomerism and IUPAC nomenclature of the organic compounds.
			202.2	Explain the name reactions and its orientations.
			202.3	Predict reactivity and stability of organic compounds.
			202.4	Illustrate the uses of organic compounds.
			202.5	Outline identification or confirmatory tests of organic compounds.
		Biochemistry – Theory	203.1	Define basics of biochemistry.
			203.2	Explain the metabolism of nutrient molecules.
			203.3	Outline the concept of biological oxidation.
			203.4	Summarize the nucleic acid metabolism and genetic information transfer.
			203.5	Understand the biochemical role of enzymes in drugs and therapeutics.
		Pathophysiology – Theory	204.1	Outline basic concepts and mechanisms of cell injury and adaptation; inflammation and tissue repair.
			204.2	Illustrate pathophysiology's of different organ systems of the body.
			204.3	Analyse complications associated with pathologies of different organ systems.
			204.4	Enlist different diagnostic tests used for diagnosis of pathologies.
			204.5	Appraise role of drugs in alleviation of various pathologies.
			204.6	Explain generation of neoplasm and the etiologic factors responsible for it.
		Computer Applications in Pharmacy	205.1	Outline basic concepts and application of computers in pharmacy
			205.2	Explain role of databases
			205.3	Discuss use of computers in Hospital and Clinical Pharmacy
			205.4	Summarize data analysis in Preclinical development
			205.5	Extend role of databases in Bioinformatics

Year	Semester	Course with code	Course Outcome Number	Course Outcome: Upon completion of the course, the learner shall be able to:
FIRST YEAR B. PHARMACY	Semester- II	**Environmental sciences**	206.1	Describe basics of the environment and its allied problems
			206.2	Show the awareness about environmental problems among learners
			206.3	Outline skills to help the concerned individuals in identifying and solving environmental problems.
			206.4	Demonstrate an attitude of concern for the environment.
			206.5	Plan to attain harmony with Nature.
		Human Anatomy and Physiology II (Practical)	207.1	Illustrate the anatomy of systems of the human body using specimen, models, charts, etc.
			207.2	Demonstrate the function of nervous system and total blood count by cell analyzer.
			207.3	Perform recording of body temperature and BMI.
			207.4	Outline different types of taste, permanent slides of vital organs, tidal volume and vital capacity.
		Pharmaceutical Organic Chemistry I – (Practical)	208.1	Explain systematic qualitative analysis of unknown organic compounds.
			208.2	Illustrate physical constant determinations of organic compounds.
			208.3	Summarize solid derivative preparation of organic compounds.
			208.4	Demonstrate the construction of molecular models.
		Biochemistry – (Practical)	209.1	Outline the various qualitative tests of biomolecules.
			209.2	Summarize the various quantitative analyses of biomolecules.
			209.3	Demonstrate the preparation of buffer solution and measurement of pH
			209.4	Relate the effect of temperature and substrate salivary amylase activity.
		Computer Applications in Pharmacy (Practical)	210.1	Summarize MS Access.
			210.2	Explain HTML web page.
			210.3	Outline MS WORD.
			210.4	Illustrate Web and XML pages.

Year	Semester	Course with code	Course Outcome Number	Course Outcome: Upon completion of the course, the learner shall be able to:
SECOND YEAR B. PHARMACY	Semester- III	**Pharmaceutical Organic Chemistry-II**	301.1	Summarize the organic chemistry aspects of some important organic compounds in pharmaceuticals.
			301.2	Illustrate the reactivity, orientation and stability of organic reactions.
			301.3	Describe the chemistry of fats, oils and cycloalkanes.
			301.4	Summarize the chemistry and uses of polynuclear organic compounds.
			301.5	Cite structure and uses of important organic compound
		Physical Pharmaceutics-I	302.1	Predict solubility of drug and factors affecting the solubility.
			302.2	Describe the various state of matter and their properties along with the physicochemical properties of drug molecules.
			302.3	Express surface and interfacial phenomenon.
			302.4	Discuss pharmaceutical complexation and protein binding.
			302.5	Outline pH and buffers with concepts related to it.
		Pharmaceutical Microbiology	303.1	Understand methods of identification, cultivation and preservation of various microorganisms.
			303.2	Summarize importance and implementation of sterilization in pharmaceutical processing and industry
			303.3	Illustrate sterility testing of pharmaceutical products.
			303.4	Appraise microbiological standardization of Pharmaceuticals.
			303.5	Explain the cell culture technology and its applications in pharmaceutical industries.
		Pharmaceutical Engineering	304.1	Explain basics of unit operations in pharmaceutical industries.
			304.2	Elaborate fluid flow and its measurement along with size reduction and separation.
			304.3	Illustrate heat transfer, evaporation and distillation as unit operations.
			304.4	Summarize process of drying, mixing, filtration and centrifugation.
			304.5	Identify the materials of construction and corrosion.
		Pharmaceutical Organic Chemistry-II (Practical)	305.1	Summarize the preparation, purification and quantification of important organic compounds
			305.2	Finding the Acid value, saponification value and Iodine value
			305.3	Infer the theoretical and percentage yields of the products obtained by synthesis.
			305.4	Complete the synthesis of various organic compounds by different chemical reactions.

Year	Semester	Course with code	Course Outcome Number	Course Outcome: Upon completion of the course, the learner shall be able to:
SECOND YEAR B. PHARMACY	Semester- III	**Physical Pharmaceutics-I (Practical)**	306.1	Predict physical parameters of drug as well as excipients like solubility, Pka, partition coefficient, HLB, surface tension and critical micelle concentration.
			306.2	Understand complex and adsorption isotherm
			306.3	Determination of stability constants using different methods.
			306.4	Predict solubility of partially miscible solvents by using CST method.
		Pharmaceutical Microbiology (Practical)	307.1	Carry out sterilization glassware's, equipment's and isolation and preservation of microorganisms.
			307.2	Interpret microorganisms on the basis of morphology and staining techniques.
			307.3	Plan and evaluate potability or drinking water along with determination of coliforms.
			307.4	Summarize sterility testing of pharmaceuticals.
		Pharmaceutical Engineering (Practical)	308.1	Illustrate energy requirements for optimizing the pharmaceutical unit processes.
			308.2	Discuss equipment's used in the manufacturing of pharmaceuticals.
			308.3	Determine moisture content, drying curves, humidity and crystallization with suitable method.
			308.4	Perform experiments related to unit operations

Year	Semester	Course with code	Course Outcome Number	Course Outcome: Upon completion of the course, the learner shall be able to:
SECOND YEAR B. PHARMACY	Semester- IV	Pharmaceutical Organic Chemistry III	401.1	Summarize the organic chemistry of stereoisomers and heteroyclic compounds.
			401.2	Find the appropriate nomenclature to heterocylic and sterioisomers.
			401.3	Illustrate synthesis and reactions of optical and geometrical isomers.
			401.4	Outline the preparation and reactions of heterocyclic compounds
			401.5	Demonstrate reactions of synthetic importance
		Medicinal Chemistry-I	402.1	Explain the medicinal chemistry of important classes of various drugs.
			402.2	Outline the drug metabolism and physicochemical properties of drugs.
			402.3	Summarize the medicinal chemistry of ANS and cholinergic neurotransmitter drugs.
			402.4	Demonstrate the medicinal chemistry of drugs acting on CNS
			402.5	Relate the structural features of drugs with their biological action.
		Physical Pharmaceutics-II	403.1	Understand concept, preparation and properties of colloidal dispersion.
			403.2	Explain flow behaviors of dispersion and deformation of solids.
			403.3	Discuss concept and properties of coarse dispersion as well as pharmaceutical powders.
			403.4	Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms
			403.5	Know the stability of drug by its physicochemical kinetic study.
		Pharmacology I	404.1	Understand the fundamental concepts of pharmacodynamics and pharmacokinetics
			404.2	Describe the mechanism of actions of different categories of drugs and their pharmacological effects on various organ systems.
			404.3	Apply the basic pharmacological knowledge in understanding the adverse effects and drug interactions
			404.4	Outline the process of drug discovery and clinical development
			404.5	Explain the pharmacology of drugs acting of peripheral and central nervous system.
		Pharmacognosy and Phytochemistry-I	405.1	Recite and classify drugs of natural origin with quality control aspects.
			405.2	Summarize the techniques in the cultivation and production of crude drugs.
			405.3	Illustrate plant tissue culture techniques with modern applications.
			405.4	Contrast various systems of medicines with respect to pharmacognosy.
			405.5	Memorize all primary metabolites with their pharmaceutical importance

Year	Semester	Course with code	Course Outcome Number	Course Outcome: Upon completion of the course, the learner shall be able to:
SECOND YEAR B. PHARMACY	Semester- IV	**Medicinal Chemistry-I (Practical)**	406.1	Plan synthesis and an assay of important drugs and intermediates.
			406.2	Select facile synthetic routes and synthesize drugs and intermediates.
			406.3	Analyze concentration of drugs in the given sample.
			406.4	Make use of the physicochemical properties and find partition coefficient drugs.
		Physical Pharmaceutics-II (Practical)	407.1	Explain measurement of micromeritic properties of drugs, excipients and dosage forms.
			407.2	Understand viscosity and sedimentation behavior.
			407.3	Judge kinetics of chemical reactions.
			407.4	Perform accelerated stability study for drug and formulation.
		Pharmacology-I (Practical)	408.1	Understand basic experimental pharmacology with animal handling.
			408.2	Outline commonly used instruments, animals and laboratory techniques used in experimental pharmacology along with the regulatory requirements.
			408.3	Describe the pharmacology of various drugs using simulated experiments acting on hepatic enzymes, ciliary motility and eye of animals.
			408.4	Demonstrate activity of drugs using simulated experiments acting on the peripheral and central nervous system of animals.
		Pharmacognosy and Phytochemistry-I (Practical)	409.1	Identify and evaluate crude drugs by chemical tests and leaf constant methods.
			409.2	Use various methods for standardization of herbal drugs.
			409.3	Relate important extraction techniques for extraction of herbal drugs.
			409.4	Memorize various index and tests for evaluation of crude drugs.

Year	Semester	Course with code	Course Outcome Number	Course Outcome: Upon completion of the course, the learner shall be able to:
THIRD YEAR B. PHARMACY	Semester- V	Organic Chemistry –III	501.1	Explain the chemistry of heterocyclic and biomolecules.
			501.2	Interpret the nomenclature of heterocyclic compounds.
			501.3	Examine the various name reactions of heterocyclic.
			501.4	Simplify the chemistry of steroids, peptides and polymers.
			501.5	Apply Merrifield solid phase synthesis of DNA
		Pharmaceutics II	502.1	Apply formulation aspects of various dosage forms.
			502.2	Build formulation and evaluation of biphasic dosage form.
			502.3	Analyze formulation and manufacturing aspects of semisolid dosage forms
			502.4	Develop pressurized packaging system for drug delivery
			502.5	Discuss the basic concepts of cosmetic science.
		Pharmaceutical Biotechnology	503.1	Make use of biotechnology in development of Pharmaceutical Products.
			503.2	Apply techniques, ethics and environmental safety involved in fermentation and recombinant DNA technology.
			503.3	Importance of molecular biology and immunology in biotechnological products.
			503.4	Utilize applications of rDNA, enzyme and cell immobilization technology in Pharmaceutical industry.
			503.5	Analyze uses of cell culture, microbial biotransformation and bioinformatics uses in Pharmaceutical industry
		Pharmacology-II	504.1	Illustrate the basic pharmacological aspects of various disorders.
			504.2	Explain pharmacology of drugs used in chemotherapy along with rational use of antimicrobials.
			504.3	Analyze pharmacology of drugs used as immunomodulators.
			504.4	Simplify pharmacology of drugs used in endocrine disorders.
			504.5	Explain pharmacology of hematological disorders.
		Cosmeticology	512.1	Apply basic aspects of cosmetic products
			512.2	Simplify raw materials for cosmetics
			512.3	Appraise toxicological aspects of cosmetics
			512.4	Categorize various cosmetic formulations along with functional evaluation
			512.5	Examine sensorial parameters of cosmetics
		Packaging of Pharmaceuticals	513.1	Construct basic packaging materials for pharmaceuticals
			513.2	Appraise Strip and Blister Packaging for pharmaceuticals
			513.3	Importance of sterilization and stability aspects for packaging
			513.4	Explain primary and ancillary packaging materials
			513.5	Describe labelling aspects of pharmaceuticals

Year	Semester	Course with code	Course Outcome Number	Course Outcome: Upon completion of the course, the learner shall be able to:
THIRD YEAR B. PHARMACY	Semester- V	Organic Chemistry Lab II	505.1	Assess the separation and quantification of binary mixtures.
			505.2	Identify organic compounds by various physiochemical tests.
			505.3	Make use of theoretical aspects of recrystallization for purification of compounds.
			505.4	Test for confirmation of organic compounds by preparing their derivatives.
		Pharmaceutics Lab II	506.1	Make use of formulation aspects for preparation of various dosage form.
			506.2	Examine formulation and evaluation parameters of biphasic system.
			506.3	Develop semisolids and cosmetics with evaluation aspects.
			506.4	Inspect pharmaceutical aerosols.
		Pharmaceutical Biotechnology Lab.	507.1	Develop hands on aseptic preparations for microbiological screenings and morphological evaluation.
			507.2	Utilize staining techniques, antimicrobial screenings and biochemical tests for microbiological evaluation.
			507.3	Analyze quality of raw materials, food products and water for assessment of extent of microbial contaminating.
			507.4	Determine TDT and TDP and its application in Pharmaceuticals.

Year	Semester	Course with code	Course Outcome Number	Course Outcome: Upon completion of the course, the learner shall be able to:
THIRD YEAR B. PHARMACY	Semester- VI	**Pharmaceutical chemistry I Theory**	601.1	Identify and study the suitable drug targets for treatment of disorders.
			601.2	Discuss the chemistry of medicinal agents.
			601.3	Illustrate QSAR of medicinal agents.
			601.4	Compile chemical classification, nomenclature and stereochemistry of medicinal agents.
			601.5	Understand mechanism of action (MOA) of different classes of medicinal compounds.
		Pharmaceutics III Theory	602.1	Discuss solid oral dosage forms and their manufacturing techniques.
			602.2	Explain solid dosage forms IPQC and evaluation including stability.
			602.3	Describe large scale manufacturing and layouts for tablet.
			602.4	Summarize importance of documentation.
			602.5	Understand the responsibilities of quality assurance & quality control departments.
		Pharmaceutical Analysis II	603.1	Choose the correct analytical method for qualitative and or quantitative estimation.
			603.2	Simplify the instrumentation of spectroscopy and other analytical techniques.
			603.3	Explain fundamentals, working principle and applications of X-ray.
			603.4	Outline the concepts and quality control aspects related to radiopharmaceuticals.
			603.5	Calculate and interpret the results for spectral analysis and statistical data analysis.
		Pharmacognosy II– Theory	604.1	Explain the concept of adulteration in crude drugs and extraction process.
			604.2	Elaborate pharmacognostic account of crude drugs containing volatile oils, resins and tannins
			604.3	Illustrate the biosynthetic pathways of constituents of volatile oils.
			604.4	Outline Pharmacognosy of terpenoids and secondary metabolites of plant tissue culture.
			604.5	Describe significance of excipients of natural origin with its applications in pharmaceuticals.
		Biopharmaceutics and Pharmacokinetics	609.1	Explain the basic terms used in Biopharmaceutics and Pharmacokinetics
			609.2	Understand the concept of pharmacokinetics models and its significance
			609.3	Summarize BCS Classification, theories of Dissolution and methods of dissolution testing
			609.4	Discuss concepts of Bioavailability and Bioequivalence and IVIVC
			609.5	Solve problems based on principles of Pharmacokinetics

Year	Semester	Course with code	Course Outcome Number	Course Outcome: Upon completion of the course, the learner shall be able to:
THIRD YEAR B. PHARMACY	Semester- VI	Pharmaceutical chemistry I Theory	610.1	Explain basic toxicology and general management of poisoning.
			610.2	Describe various organ specific toxicities and toxicities associated with use of alcohol, morphine and barbiturate.
			610.3	Elaborate on guidelines to be followed to carry out acute, sub-acute and chronic toxicities and alternatives to animal studies.
			610.4	Demonstrate the knowledge of regulatory toxicology, regulatory scenario with respect to India and concept of risk assessment and management of risk.
			610.5	Discuss regulatory toxicology aspects in design of nonclinical toxicology and clinical development of drugs.
		Pharmaceutical Chemistry Lab I	605.1	Design and perform various unit operations of organic synthetic reactions
			605.2	Characterize reaction intermediates and final products.
			605.3	Apply the theoretical concepts behind organic synthesis.
			605.4	Understand principle behind green chemistry technique in chemical synthesis/ organic synthesis.
		Pharmaceutics Lab III	606.1	Elaborate preformulation aspects of solid dosage form
			606.2	Explain formulation of solid dosage forms like tablets and capsules and evaluate them for their quality.
			606.3	Understand the tablet coating process.
			606.4	Illustrate the concepts of accelerated stability testing and shelf life calculations
		Pharmaceutical Analysis Lab II	607.1	Understand the sample preparation technique for FTIR spectroscopy, interpret the IR spectra.
			607.2	Outline the various methods of spectroscopy with its utility in assay of drugs.
			607.3	Analyze pka and other properties of drugs by potentiometry.
			607.4	Demonstrate the use of flame photometer and fluorimeter.

Year	Semester	Course with code	Course Outcome Number	Course Outcome: Upon completion of the course, the learner shall be able to:
FOURTH YEAR B. PHARMACY	Semester- VII	Pharmaceutical chemistry II	701.1	Discuss the chemistry of medicinal agents.
			701.2	Compile chemical classification, nomenclature and stereochemistry of medicinal agents.
			701.3	Modify structure of drugs by reviewing SAR and metabolism.
			701.4	Perceive MOA of different classes of medicinal compounds.
			701.5	Design the synthesis of drugs.
		Pharmacognosy III	702.1	Discuss the Pharmacognosy of drugs containing alkaloids, glycosides and glycoproteins
			702.2	Elaborate biosynthetic pathways of alkaloids from various amino acids.
			702.3	Appraise biopharmaceutical considerations and pharmacopeial study of herbal drugs.
			702.4	Develop alternative system of formulations using some natural excipients and their standardization along with regulatory aspects.
			702.5	Interpret some important phytoconstituents by spectroscopic techniques.
		Pharmaceutical Analysis III	703.1	Explain the various methods used for the multicomponent analysis of drugs by UV spectroscopy.
			703.2	Discuss chromatographic and hyphenated techniques for qualitative and quantitative analysis.
			703.3	Elaborate NMR and mass spectrometry.
			703.4	Evaluate the spectral data for structural interpretation of chemical compound.
			703.5	Assess analytical method validation.
		Pharmaceutical Jurisprudence	705.1	Assess the Pharmaceutical legislations in India and rules therein.
			705.2	Describe various regulatory procedures for drugs and cosmetics and other related acts.
			705.3	Explain IPC & CRPC aspects along with provisions of drug price control order.
			705.4	Describe provisions of Indian Patent act.
			705.5	Appraise role of drug regulatory agencies of developed countries guidelines of the same.
		Intellectual Property Rights	709.1	Discuss basics of IPR with respect to pharmaceuticals.
			709.2	Perceive the knowledge of patents with case studies.
			709.3	Adapt various harmonized practices and integrate the knowledge required for various intellectual properties.
			709.4	Explain significance of rules and regulations pertaining to IPR.
			709.5	Justify the role of IPR in pharmaceutical product launch.

Year	Semester	Course with code	Course Outcome Number	Course Outcome: Upon completion of the course, the learner shall be able to:
FOURTH YEAR B. PHARMACY	Semester- VII	Pharmacognosy Lab II	706.1	Evaluate physicochemical characteristics of powdered crude drugs and monograph analyses.
			706.2	Judge authenticity of powder formulation on the basis of qualitative chemical tests and powder microscopy.
			706.3	Determine the total aldehyde content/phenol content/ total alkaloids in crude drugs.
			706.4	Estimate actives of crude drug using suitable isolation and detection method.
			706.5	Analyze morphological characters of marketed formulation.
		Pharmaceutical analysis lab III	707.1	Evaluate the concentration of analytes by UV Spectroscopic multicomponent analytical methods.
			707.2	Estimate different chromatographic techniques for qualitative and quantitative applications.
			707.3	Assess validation parameters for analytical methods.
			707.4	Predict the amount of drug in marketed formulation
		Pharmacology Lab II	708.1	Estimate the concentration of unknown using bioassay technique.
			708.2	Appraise the role of oxytocin using suitable bioassay method.
			708.3	Demonstrate pharmacology of drugs affecting behavior using suitable simulations.
			708.4	Discuss the guidelines and protocols in toxicity studies.

Year	Semester	Course with code	Course Outcome Number	Course Outcome: Upon completion of the course, the learner shall be able to:
FOURTH YEAR B. PHARMACY	Semester- VIII	Pharmaceutical Chemistry III	801.1	Discuss the medicinal chemistry of CNS and ANS drugs and there utility in therapeutics.
			801.2	List opioid receptors and chemistry of drugs acting on it.
			801.3	Outline chemistry of NSAIDs
			801.4	Appraise chemistry of drugs used in treatment of gout.
			801.5	Discuss the chemistry of drugs containing steroidal ring.
		Pharmaceutics IV	802.1	Discuss preformulation and formulation aspects of sterile products.
			802.2	Explain oral SR/CR products, principles of design, development and evaluation.
			802.3	Understand concepts of validation and pilot plant scale up for large scale manufacturing operations.
			802.4	Know the importance of Industrial Pharmacy and NDDS.
			802.5	Demonstrate biopharmaceutics and significance of various pharmacokinetic parameters.
		Clinical Pharmacy	807.1	Relate to the role of pharmacist in different setups like clinics, pharmacies and in the community.
			807.2	Appraise the crucial role of pharmacists in patient counseling and eventually in drug adherence and compliance to therapy.
			807.3	Discuss the types, risk factors, classification, and methods of detection, monitoring and reporting of ADRs, drug interactions, pharmacovigilance and TDM in normal as well as special populations.
			807.4	Outline the process of drug discovery and development, Ethical Guidelines/Schedules, Role of Ethics Committee, essential documents in clinical trials/research, BA-BE studies
			807.5	Appreciate the role of GCP in conduct of clinical research
		Novel Drug Delivery Systems	811.1	Explain basic concenpt of NDDS.
			811.2	Interprite differnet NDDS for different route- oral, transdermal, ocular, transmucosal and implantable
			811.3	Understand concepr and need of passive and active targeting.
			811.4	Explain basic concept of targeted drug delivery to colon, brain, lymphatic system and tumor
			811.5	Discuss nanocarriers for drug targeting in various tissues of human body.

Year	Semester	Course with code	Course Outcome Number	Course Outcome: Upon completion of the course, the learner shall be able to:
FOURTH YEAR B. PHARMACY	Semester- VIII	Pharmaceutical Chemistry Lab II	803.1	Perform various unit operations of organic synthetic reactions
			803.2	Characterize reaction intermediates and final products by using TLC.
			803.3	Know the theoretical concepts behind organic synthesis.
			803.4	Understand the concepts of green chemistry.
		Pharmaceutics Lab IV	804.1	Demonstrate formulation and development of parenterals and ophthalmic products.
			804.2	Understand about quality control and documentation of a manufacturing process.
			804.3	Perform the Pharmacopoeial tests on parenteral products and their packaging materials.
			804.4	Know excipient/API specifications, Validation and SOP's