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 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, Pharmacognosy
PSO 3.	Perform research on various medical aspects and implement the Pharmaceutical knowledge in formulating the best suitable dosage form to provide high quality medicines to the society.
PSO 4.	Upgrade practical skill of the students through industrial training and research to meet the challenges of the Pharmaceutical field.
PSO 5.	Promote the development of communication skills, leadership qualities, ethics and regulatory aspects of Pharmaceuticals among the students.

Class: FIRST YEAR B. PHARMACY Semester- I Course: Human Anatomy and Physiology I	
Upon completion of the course, the learner shall be able to:	
CO. No	Course Outcome
101.1	Explain the gross morphology, structure and functions of various organs of the human
101.2	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.

Class: FIRST YEAR B. PHARMACY Semester- I Course: Pharmaceutical Analysis I	
Upon completion of the course, the learner shall be able to:	
CO. No	Course Outcome
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

Class: FIRST YEAR B. PHARMACY Semester- I Course: Pharmaceutics I	
Upon completion of the course, the learner shall be able to:	
CO. No	Course Outcome
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

Class: FIRST YEAR B. PHARMACY Semester- I Course: Pharmaceutical Inorganic Chemistry	
Upon completion of the course, the learner shall be able to:	
CO. No	Course Outcome
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 radiopharmaceuticals.

Class: FIRST YEAR B. PHARMACY
Semester- I
Course: Communication skills

Upon completion of the course, the learner shall be able to:

CO. No	Course Outcome
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	Lear effective manage the team as a team player
105.4	Develop interview skills
105.5	Summarize body language and personality development

Class: FIRST YEAR B. PHARMACY
Semester- I
Course: Remedial Biology

Upon completion of the course, the learner shall be able to:

CO. No	Course Outcome
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.

Class: FIRST YEAR B. PHARMACY
Semester- I
Course: Remedial Mathematics

Upon completion of the course, the learner shall be able to:

CO. No	Course Outcome
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

Class: SECOND YEAR B. PHARMACY
Semester I
Course: Human Anatomy and Physiology –Practical

Upon completion of the course, the learner shall be able to:

CO No	Course Outcome
107.1	Estimate 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.

Class: SECOND YEAR B. PHARMACY
Semester I
Course: Pharmaceutical Analysis Lab- I

Upon completion of the course, the learner shall be able to:	
CO No	Course Outcome
108.1	Apply the practice of volumetric analysis with assay & standardization.
108.2	Experiment with given samples for volumetric, gravimetric and solvent extraction methods.
108.3	Utilize pharmacopoeial monographs to evaluate samples.
108.4	Demonstrate assay of sodium benzoate, sodium chloride and potassium chloride.

Class: FIRST YEAR B. PHARMACY **Semester- I** **Course: Pharmaceutics-I** Practical	
Upon completion of the course, the learner shall be able to:	
CO. No	Course Outcome
109.1	Read prescription and commonly used Latin terms in pharmacy practice
109.2	Interpret quantities of active and inactive ingredient required for formulation.
109.3	Relate compounding, labeling and dispensing of extemporaneous preparations.
109.4	Summarize patient counseling and patient education methods

Class: FIRST YEAR B. PHARMACY **Semester- I** **Course:** Pharmaceutical Inorganic Chemistry –Practical	
Upon completion of the course, the learner shall be able to:	
CO. No	Course Outcome
110.1	Apply limit tests for inorganic ions
110.2	Relate identification test for inorganic substances
110.3	Perform test for purity
110.4	Summarize Preparation of inorganic pharmaceuticals

Class: FIRST YEAR B. PHARMACY **Semester- I** **Course:** Communication skills –Practical	
Upon completion of the course, the learner shall be able to:	
CO. No	Course Outcome
111.1	Understand basic communication covering the Meeting People, Asking Questions, Making Friends What did you do? and Do's and Dont's
111.2	Relate pronunciation consonant sounds, nouns and vowel sounds
111.3	Read advanced learning
111.4	Summarize Interview handling skills, E-Mail etiquette and presentation Skills

Class: FIRST YEAR B. PHARMACY **Semester- I** **Course:** Remedial Biology – Practical	
Upon completion of the course, the learner shall be able to:	
CO. No	Course Outcome
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.

Class: FIRST YEAR B. PHARMACY Semester- II Course: Human Anatomy and Physiology II (Theory)	
Upon completion of the course, the learner shall be able to:	
Co. No	**Course Outcome**
201.1	Explain the component of Nervous system with reference to structural and functional anatomy of brain.
201.2	Summarize processes and part of organs in digestive system and their function.
201.3	Interpret role of urinary system in water salt balance with brief anatomy and physiology of kidney, nephron, urinary bladder.
201.4	Outline the chemical co-ordination and the role of hormones in the body homeostasis, growth, development and metabolism.
201.5	Illustrate the components of reproductive system with reference to physiology of menstruation, fertilization, spermatogenesis, oogenesis, pregnancy and parturition.
201.6	Explain physiological processes and mechanism for respiration.

Class: FIRST YEAR B. PHARMACY Semester- II Course: Pharmaceutical Organic Chemistry I – Theory	
Upon completion of the course, the learner shall be able to:	
Co. No	**Course Outcome**
202.1	Name the type of isomerism and IUPAC nomenclature of the organic compounds.
202.2	Explain the name reactions and its orientations.
202.3	Find reactivity and stability of organic compounds.
202.4	Illustrate the uses of organic compounds.
202.5	Choose identification or confirmatory tests of organic compounds.

Class: FIRST YEAR B. PHARMACY Semester- II Course: Biochemistry – Theory	
Upon completion of the course, the learner shall be able to:	
Co. No	**Course Outcome**
203.1	Demonstrate the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs and therapeutics.
203.2	Choose diagnostic applications of enzymes.
203.3	Explain the metabolism of nutrient molecules in physiological and pathological conditions.
203.4	Summarize the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.
203.5	Outline the biochemistry of biomolecules.

Class: FIRST YEAR B. PHARMACY Semester- II Course: Pathophysiology – Theory	
Upon completion of the course, the learner shall be able to:	
Co. No	**Course Outcome**

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.

Class: FIRST YEAR B. PHARMACY Semester- II Course: Computer Applications in Pharmacy	
Upon completion of the course, the learner shall be able to:	
Co. No	**Course Outcome**
204.1	Outline basic concepts and application of computers in pharmacy
204.2	Appraise role of databases
204.3	Outline applications of databases in Hospital and Clinical Pharmacy
204.4	Summarize data analysis in Preclinical development
204.5	Appraise role of databases in Bioinformatics

Class: FIRST YEAR B. PHARMACY Semester- II Course: Environmental sciences	
Upon completion of the course, the learner shall be able to:	
Co. No	**Course Outcome**
203.1	Appraise role the basic knowledge about the environment and its allied problems
203.2	Summarize the awareness about environmental problems among learners
203.3	Outline skills to help the concerned individuals in identifying and solving environmental problems.
203.4	Demonstrate an attitude of concern for the environment.
203.5	Interpret to attain harmony with Nature

Class: FIRST YEAR B. PHARMACY Semester- II Course: Human Anatomy and Physiology II (Practical)	
Upon completion of the course, the learner shall be able to:	
Co. No	**Course Outcome**
207.1	Illustrate the anatomy of the integumentary and special senses, nervous system, endocrine system, digestive system, respiratory system, using specimen, models charts, etc.
207.2	Demonstrate the function of olfactory nerve, visual acuity, reflex activity, positive and negative feedback mechanism, neurological examinations, total blood count by cell analyser.
207.3	Explain how to record body temperature and body mass index.
207.4	Outline different types of taste, permanent slides of vital organs, tidal volume and vital capacity.

Class: FIRST YEAR B. PHARMACY Semester- II Course: Pharmaceutical Organic Chemistry I – Practical	
Upon completion of the course, the learner shall be able to:	
Co. No	**Course Outcome**
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.

Class: FIRST YEAR B. PHARMACY Semester- II Course: Biochemistry – Practical	
Upon completion of the course, the learner shall be able to:	
Co. No	**Course Outcome**

209.1	Outline the various qualitative of biomolecules.
209.2	Summarize the various quantitative 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.

Class: FIRST YEAR B. PHARMACY **Semester- II** **Course: Computer Applications in Pharmacy**	
Upon completion of the course, the learner shall be able to:	
Co. No	**Course Outcome**
210.1	Summarize MS Access
210.2	Explain HTML web page
210.3	Outline MS WORD
210.4	Illustrate Web and XML pages

Class: SECOND YEAR B. PHARMACY **Semester III** **Course:** Organic Chemistry I	
Upon completion of the course, the learner shall be able to:	
CO No	Course Outcome
301.1	Summarize the basic concepts of organic chemistry for mono and polyfunctional compounds.
301.2	Explain the concepts of stereochemistry for organic compounds.
301.3	Outline the ionization, acidity, basicity and pKa of organic compounds.
301.4	Relate geometry, stability and properties of the reaction intermediate.
301.5	Illustrate the influence of structure on physicochemical properties of medicinal agents.

Class: SECOND YEAR B. PHARMACY **Semester III** Course: PHYSICAL PHARMACY	
Upon completion of the course, the learner shall be able to:	
CO. No	Course Outcome
302.1	Demonstrate various physical phenomena for design of dosage forms.
302.2	Identify various physical parameters of drugs and excipents.
302.3	Summarize state of matter, interfacial phenomena and buffers.
302.4	Interpret ionic equilibria, solubility and distribution phenomena in formulations.
302.5	Outline rheology and deformation of solids.

Class: SECOND YEAR B. PHARMACY **Semester III** Course: **Anatomy, Physiology & Pathophysiology**	
Upon completion of the course, the learner shall be able to:	
CO. No	Course Outcome
303.1	Explain the anatomy and physiology of the reproductive system and cardiovascular system.
303.2	Discuss the anatomy and physiology of the urinary system and digestive system.
303.3	Describe the concept, significance and application of ECG.
303.4	Summarize the etiology, pathogenesis, signs and symptoms of common diseases of the reproductive system and cardiovascular system,.
303.5	Summarize the etiology, pathogenesis, signs and symptoms of common diseases of the urinary system and digestive System.

Class: SECOND YEAR B. PHARMACY Semester III Course: Pharmaceutical Analysis- I	
Upon completion of the course, the learner shall be able to:	
CO No	Course Outcome
304.1	Explain the basic concepts of pharmaceutical analysis.
304.2	Summarize the errors of pharmaceutical analysis with basic numerals.
304.3	Outline the volumetric methods of pharmaceutical analysis.
304.4	Make use of electro-analytical techniques & miscellaneous methods.
304.5	Illustrate the gravimetric & liquid-liquid extraction techniques as analytical methods.

Class: SECOND YEAR B. PHARMACY Semester III Course: Pharmaceutical Engineering	
Upon completion of the course, the learner shall be able to:	
CO No	Course Outcome
305.1	Explain basics of unit operations and safety aspects in pharmaceutical industries.
305.2	Elaborate fluid flow and its measurement.
305.3	Illustrate types of pumps, heat measuring devices, conveyors and crystallizers.
305.4	Summarize process of evaporation, distillation and refrigeration.
305.5	Identify the materials of construction and corrosion.

Class: SECOND YEAR B. PHARMACY Semester III Course: Organic Chemistry Lab I	
Upon completion of the course, the learner shall be able to:	
CO No	Course Outcome
306.1	Build safety measures in the laboratory.
306.2	Utilize theoretical aspects for determination of physical constant and functional group.
306.3	Infer organic spotting of mono and bi-functional group samples.
306.4	Demonstrate the determination of Log P values.

Class: SECOND YEAR B. PHARMACY Semester III Course: PHYSICAL PHARMACY, Lab	
Upon completion of the course, the learner shall be able to:	
CO. No	Course Outcome
307.1	Illustrate testing of various physical parameters.
307.2	Summarize the principles for determination of physical parameters.
307.3	Explain methods for determination of physical parameters.
307.4	Demonstrate HLB number of surfactants.

Class: SECOND YEAR B. PHARMACY Semester- IV Course: Pharmaceutical Organic Chemistry III– Theory	
Upon completion of the course, the learner shall be able to:	
Co. No	Course Outcome
401.1	Summarize the methods of preparation of organic compounds.
401.2	Outline the properties of organic compounds.
401.3	Explain the stereo chemical aspects of organic compounds.
401.4	Illustrate the stereo chemical reactions.

401.5	Relate medical uses and other application of organic compounds.

Class: SECOND YEAR B. PHARMACY **Semester- IV** **Course: Medicinal Chemistry I – Theory**	
Upon completion of the course, the learner shall be able to:	
Co. No	Course Outcome
402.1	Identify and study the suitable drug targets for treatment of disorders.
402.2	Understand the chemistry of drugs with respect to their pharmacological activity.
402.3	Know the Structural Activity Relationship (SAR) of different class of drugs.
402.4	Outline the drug metabolic pathways, adverse effect and therapeutic value of drugs.
402.5	Demonstrate the medicinal chemistry of important drugs.

Class: SECOND YEAR B. PHARMACY **Semester- IV** **Course: Physical Pharmaceutics II – Theory**	
Upon completion of the course, the learner shall be able to:	
Co. No	Course Outcome
403.1	Understand various physicochemical properties of drug molecules in the designing the dosage forms
403.2	Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
403.3	Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.
403.4	Understand concept, preparation and properties of colloidal dispersion.
403.5	Explain concept and types of flow behaviors of dispersion.

Class: SECOND YEAR B. PHARMACY **Semester- IV** **Course: Pharmacology I – Theory**	
Upon completion of the course, the learner shall be able to:	
Co. No	Course Outcome
404.1	Understand the pharmacological actions of different categories of drugs
404.2	Explain the mechanism of drug action at organ system/subcellular/macromolecular levels.
404.3	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
404.4	Outline the process of drug discovery and development.
404.5	Summarize the pharmacology of drugs acting on the Autonomic Nervous System and Central Nervous System ailments

Class: SECOND YEAR B. PHARMACY **Semester- IV** **Course: Pharmacognosy and Phytochemistry I– Theory**	
Upon completion of the course, the learner shall be able to:	
Co. No	Course Outcome
405.1	Read the introduction, history, scope & development of Pharmacognosy.
405.2	Express the classification and evaluation of crude drugs
405.3	Explain the Cultivation, Collection, processing and storage of DONO.
405.4	Recognize the role Pharmacognosy in various alternate systems of medicine and
405.5	Describe the biological source, chemical nature and uses of DONO containing carbohydrates, lipids, plant fibres and Proteins & enzymes

Class: FIRST YEAR B. PHARMACY Semester- II Course: Medicinal Chemistry I – Practical	
Upon completion of the course, the learner shall be able to:	
Co. No	**Course Outcome**
406.1	Summarize the synthesis of organic compounds.
406.2	Choose the correct method for assay of synthesized drugs.
406.3	Interpret the partition coefficient of drug.
406.4	Explain the synthesis of intermediates.

Class: FIRST YEAR B. PHARMACY Semester- II Course: Physical Pharmaceutics II – Practical	
Upon completion of the course, the learner shall be able to:	
Co. No	**Course Outcome**
407.1	Explain micrometric and rheological properties of active and inactive pharmaceutical ingredients
407.2	Explain measurement of physical properties of drug molecules.
407.3	Understand stability of dispersed systems.
407.4	Interpret kinetics of chemical reactions.

Class: FIRST YEAR B. PHARMACY Semester- II Course: Pharmacology I – Practical	
Upon completion of the course, the learner shall be able to:	
Co. No	**Course Outcome**
408.1	Appraise the concepts of animal ethics and care.
408.2	Justify the use of alternative methods to in vivo animal models.
408.3	Appreciate correlation of pharmacology with other bio medical sciences.
408.4	Observe the effect of drugs on animals by simulated experiments.

Class: THIRD YEAR B. PHARMACY Semester V Course: ORGANIC CHEMISTRY –III	
Upon completion of the course, the learner shall be able to:	
CO No	Course Outcome
501.1	Explain the chemistry of heterocycles and biomolecules.
501.2	Interpret the nomenclature of heterocyclic compounds.
501.3	Examine the various named reactions of heterocycles.
501.4	Simplify the chemistry of steroids, peptides and polymers.
501.5	Apply Merrifield solid phase synthesis of DNA

Class: THIRD YEAR B. PHARMACY Semester V Course: Pharmaceutics II	
Upon completion of the course, the learner shall be able to:	
CO No	Course Outcome
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	Simplify the basic concepts of cosmetic science.

Class: THIRD YEAR B. PHARMACY **Semester V** **Course: Pharmaceutical Biotechnology**	
Upon completion of the course, the learner shall be able to:	
CO No	Course Outcome
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

Class: THIRD YEAR B. PHARMACY **Semester V** **Course:** Pharmacology-II	
Upon completion of the course, the learner shall be able to:	
CO No	Course Outcome
504.1	Build 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 haematological disorders.

Class: THIRD YEAR B. PHARMACY **Semester V** **Course: Cosmeticology**	
Upon completion of the course, the learner shall be able to:	
CO. No	Course Outcome
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

Class: THIRD YEAR B. PHARMACY **Semester V** **Course: Packaging of Pharmaceuticals**	
Upon completion of the course, the learner shall be able to:	
CO. No	Course Outcome
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

Class: THIRD YEAR B. PHARMACY **Semester V** **Course:** ORGANIC CHEMISTRY Lab–II
Upon completion of the course, the learner shall be able to:

CO No	Course Outcome
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.

Class: THIRD YEAR B. PHARMACY **Semester V** **Course:** Pharmaceutics II	
Upon completion of the course, the learner shall be able to:	
CO No	Course Outcome
502.1	Make use of formulation aspects for preparation of various dosage form.
502.2	Examine formulation and evaluation parameters of biphasic system.
502.3	Simplify Preparation and evaluation aspect of semisolids with cosmetics.
502.4	Inspect pharmaceutical aerosols.

Class: THIRD YEAR B. PHARMACY **Semester- V** **Course: Experimental Techniques in Microbiology and Biotechnology Lab**	
Upon completion of the course, the learner shall be able to:	
Co. No	**Course Outcome**
507.1	Develop hands on media sterilization techniques and 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	Relationship of TDT and TDP and its application in Pharmaceuticals.

Class: THIRD YEAR B. PHARMACY **Semester- VI** **Course: Medicinal Chemistry III – Theory**	
Upon completion of the course, the learner shall be able to:	
Co. No	Course Outcome
601.1	Identify and study the suitable drug targets for treatment of disorders
601.2	Discuss the chemistry of medicinal agents.
601.3	Identify the relationship between the physicochemical properties of the chemical entity and biological response
601.4	Compile chemical classification, nomenclature and stereochemistry of medicinal agents.
601.5	Understand mechanism of action (MOA) of different classes of medicinal compounds.

Class: THIRD YEAR B. PHARMACY **Semester- VI** **Course: Pharmaceutics III – Theory**	
Upon completion of the course, the learner shall be able to:	
Co. No	Course Outcome
602.1	Discuss solid oral dosage forms and their manufacturing techniques.
602.2	Explain the development of pharmaceutical dosage forms including stability
602.3	Apprise formulation of solid dosage forms and evaluate them for their quality
602.4	Summarize importance of documentation

602.5	Understand the responsibilities of quality assurance & quality control departments

Class: THIRD YEAR B. PHARMACY **Semester- VI** **Course: Pharmaceutical Analysis II**	
Upon completion of the course, the learner shall be able to:	
Co. No	Course Outcome
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	Generalize the concepts and quality control aspects related to radiopharmaceuticals.
603.5	Calculate and interpret the results for spectral analysis and statistical data analysis.

Class: THIRD YEAR B. PHARMACY **Semester- VI** **Course: Pharmacognosy II– Theory**	
Upon completion of the course, the learner shall be able to:	
Co. No	Course Outcome
604.1	Explain the concept of adulteration and substitution in crude drugs and summarize extraction process for phyto-constituents using different methods
604.2	Classify and explain the source, composition, general methods of extraction, evaluation, chemical tests, therapeutic uses of crude drugs containing volatile oils, resins and tannins
604.3	Elaborate on the biosynthesis of monoterpenoids and phenypropanoid constituents of volatile oils.
604.4	Illustrate the source, composition and chemistry of different classes of phytoconstituents like terpenoids, organo sulfur, and quinones along with techniques of plant tissue culture techniques with respect to production of secondary metabolites and edible vaccines
604.5	Analyze the significance & utility of excipients of natural origin, used in pharmaceutical formulations, such as binding, colouring, sweetening and flavouring agents

Class: THIRD YEAR B. PHARMACY **Semester- VI** **Course: Biopharmaceutics and Pharmacokinetics**	
Upon completion of the course, the learner shall be able to:	
Co. No	Course Outcome
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	Compile problems based on principles of Pharmacokinetics

Class: THIRD YEAR B. PHARMACY **Semester- VI** **Course: Basic Principles of Toxicology**	
Upon completion of the course, the learner shall be able to:	
Co. No	Course Outcome
610.1	Explain basic toxicology terminologies, mechanism of toxicity, factors influencing toxicity 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, subacute 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.

Class: FIRST YEAR B. PHARMACY Semester- II Course: Pharmaceutical Chemistry Lab I	
Upon completion of the course, the learner shall be able to:	
Co. No	**Course Outcome**
605.1	Design and perform various unit operations of organic synthetic reactions
605.2	Characterize reaction intermediates and final products.
605.3	Know the theoretical concepts behind organic synthesis.
605.4	Understand principle behind green chemistry technique in chemical synthesis/ organic synthesis.

Class: FIRST YEAR B. PHARMACY Semester- II Course: Pharmaceutics Lab III	
Upon completion of the course, the learner shall be able to:	
Co. No	**Course Outcome**
605.1	Elaborate preformulation aspects of solid dosage form
605.2	Explain formulation of solid dosage forms like tablets and capsules and evaluate them for their quality.
605.3	Understand the tablet coating process.
605.4	Know the concepts of accelerated stability testing and shelf life calculations

Class: Third Year B. Pharmacy Semester: VI Course name: Pharmaceutical Analysis II (Practical)	
Upon completion of the course, the learner shall be able to:	
CO. No.	Course Outcome
607.1	Understand the sample preparation technique for FTIR spectroscopy, interpret the IR spectra.
607.2	Classify the various methods of spectroscopy and utilize for assay of drugs.
607.3	Analyze pka and other properties of drugs by potentiometry.
607.4	Demonstrate the use of flame photometer and fluorimeter.

lass: FINAL YEAR B. PHARMACY Semester VII Course: Pharmaceutical Chemistry II	
Upon completion of the course, the learner shall be able to:	
CO No	Course Outcome
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.

Class: FINAL YEAR B. PHARMACY Semester- VII Course: Pharmacognosy III

Upon completion of the course, the learner shall be able to:	
Co.No	**Course Outcome**
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	Assess biopharmaeutical considerations for 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.

Class: FINAL YEAR B. PHARMACY **Semester VII** **Course: Pharmaceutical Analysis III**	
Upon completion of the course, the learner shall be able to:	
CO No	Course Outcome
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

Class: FINAL YEAR B. PHARMACY **Semester VII** **Course:** Pharmacology-III	
Upon completion of the course, the learner shall be able to:	
CO No	Course Outcome
704.1	Adapt basic concepts of pharmacological and toxicological aspects of various disorders.
704.2	Assess involvement of autacoids along with therapeutics of inflammatory processes.
704.3	Justify the approaches to the treatment of respiratory disorders.
704.4	Explain the pharmacotherapy of gastrointestinal and CNS ailments.
704.5	Elaborate the concepts and general management of toxicity.

Class: FINAL YEAR B. PHARMACY **Semester- VII** **Course: Pharmaceutical Jurisprudence**	
Upon completion of the course, the learner shall be able to:	
Co. No	**Course Outcome**
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	Examine IPC & CRPC aspects along with the pricing of Pharmaceuticals.
705.4	Describe the process of filing Patent as per Indian Patent act
705.5	Analyze drug regulatory affairs in India along with some developed countries.

Class: FINAL YEAR B. PHARMACY **Semester- VII** **Course: Intellectual Property Rights**	
Upon completion of the course, the learner shall be able to:	
Co. No	**Course Outcome**

705.1	Discuss basics of IPR with respect to pharmaceuticals.
705.2	Perceive the knowledge of patents with case studies.
705.3	Adapt various harmonized practices and integrate the knowledge required for various intellectual properties.
705.4	Explain significance of rules and regulations pertaining to IPR.
705.5	Justify the role of IPR in pharmaceutical product launch.

Class: FINAL YEAR B. PHARMACY
Semester- VII
Course: Pharmacognosy Lab II

Upon completion of the course, the learner shall be able to:

Co. No	Course Outcome
706.1	Evaluate crude drugs based on morphological and microscopical characters.
706.2	Judge quality of crude drugs 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	Apply knowledge of microscopic characters in ascertaining the quality of powdered drug.
706.1	Evaluate crude drugs based on morphological and microscopical characters.

Class: FINAL YEAR B. PHARMACY
Semester- VII
Course: _Pharmaceutical analysis lab III

Upon completion of the course, the learner shall be able to:

Co. No.	Course Outcome
707.1	Evaluate the concentration of analyte 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

Class: FINAL YEAR B. PHARMACY
Semester VII
Course: Pharmacology Lab II

Upon completion of the course, the learner shall be able to:

CO No	Course Outcome
708.1	Appraise the concepts of animal ethics and care.
708.2	Justify the use of alternative methods to *in vivo* animal models.
708.3	Estimate the concentration of unknown using bioassay technique.
708.4	Discuss the OECD and CPCSEA guidelines.

Class: Final Year B. Pharmacy
Semester: VIII
Course name: Pharmaceutical Chemistry III

Upon completion of the course, the learner shall be able to:

CO. No.	Course Outcome
801.1	Discuss the medicinal chemistry of drugs.
801.2	Compile chemical classification, nomenclature and stereochemistry of medicinal agents.
801.3	Modify structure of drugs by reviewing SAR and metabolism.
801.4	Perceive MOA of different classes of medicinal compounds.
801.5	Design the synthesis of drugs.

Class: Final Year B. Pharmacy Semester: VIII Course name: Pharmaceutics IV	
Upon completion of the course, the learner shall be able to:	
CO. No.	Course Outcome
801.1	Discuss preformulation aspects of .Parenteral products
801.2	Explain oral SR/CR products, principles of design, development and evaluation.
801.3	Understand concepts of validation and pilot plant scale up for large scale manufacturing operations.
801.4	Know the importance of Industrial Pharmacy.
801.5	Demonstrate biopharmaceutics and significance of various pharmacokinetic parameters

Class: Fourth Year B. Pharmacy Semester: VIII Course name: Pharmaceutical Chemistry II (Practical)	
Upon completion of the course, the learner shall be able to:	
CO. No.	Course Outcome
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	Know the concepts of green chemistry.

Class: Fourth Year B. Pharmacy Semester: VIII Course name: Pharmaceutics Lab IV	
Upon completion of the course, the learner shall be able to:	
CO. No.	Course Outcome
803.1	Demonstrate the intricacies of formulation and development of parenterals and ophthalmic products.
803.2	Understand about quality control and documentation of a manufacturing process.
803.3	Perform the Pharmacopoeial tests parenteral products and their packaging materials.
803.4	Know excipient/API specifications, Validation and SOP's

Class: Final Year B. Pharmacy Semester: VIII Course name: Clinical Pharmacy	
Upon completion of the course, the learner shall be able to:	
CO. No.	Course Outcome
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 counselling and eventually in drug adherence and compliance to therapy.
807.3	Discuss the types, risk factors, classification, 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

Class: Final Year B. Pharmacy Semester: VIII Course name: Novel Drug Delivery Systems	
Upon completion of the course, the learner shall be able to:	
CO. No.	Course Outcome
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.

Programme outcome's of Diploma in Pharmacy

Programme- Diploma In Pharmacy [1889]	
Upon completion of the programme, the learner shall be able to:	
PO. No.	**Programme Outcome**
PO.1	Access all disease conditions and interpret drug prescriptions prescribed medical practitioners.
PO.2	To prepare, package, label and dispense medications, perform non-sterile compounding
PO.3	Read, interpret and processing prescription, Maintain inventory record, analyze, organize, improvise and manage document.
PO.4	Create awareness in society about the effective and safe use of medicines along with their storage conditions.
PO.5	Demonstrate use of medical aids to patients, Solve problems as a part of healthcare system.
PO.6	Respect patients, healthcare providers and pharmacy co-workers.
PO.7	Develop an aptitude for skill development and continuous learning
PO.8	Provide empathy to chronic/emergency/economically back ward patients and their family.
PO.9	Apply ethical practices for societal benefits.

Program Specific Outcome's for Diploma in Pharmacy

PSO Code	Program Specific outcomes
PSO 01	Understand a core and basic knowledge in different subjects of diploma in Pharmacy.
PSO 02	Dispensing of medication & Assist Patients through Counseling to improve Compliance of therapy.
PSO 03	Understand the applications medicines and should be able to analyze prescriptions, drug safety and efficacy in medicine.
PSO 04	Students can be enrolled as registered pharmacist in respective state Pharmacy council.
PSO 05	Core team member in health care system of nation.

Course outcome's for Diploma in Pharmacy

Class: First Year D. Pharmacy Year: I Course name: Pharmaceutics-I [805]	
Upon completion of the course, the learner shall be able to:	
CO. No.	**Course Outcome**
805.1	**Classify** different dosage forms**.** Familiarize with new drug delivery systems.
805.2	**Describe** the history of pharmacy and Indian Pharmacopoeia.
805.3	**Enables** the students to learn about different packaging materials used in pharmaceutical industry and the factors governing their use.
805.4	**Know** the systems of weights and measures and calculations involved in formulation.
805.5	**Provide** the knowledge to the students with respect to different unit operations such as size reduction, size separation, mixing, distillation, extraction, filtration, evaporation, crystallization, drying, sterilization and aseptic techniques.
805.6	**Know** processing of tablets and capsules.
805.7	**Study** of immunological products**.**

Class: First Year D. Pharmacy Year: I Course name: Pharmaceutics-I (Practical)	
Upon completion of the course, the learner shall be able to:	
CO. No.	**Course Outcome**
805.1	**Understand** the concept of solid, liquid, semisolid dosage forms.
805.2	**Understand** the applications of excipient, formulation design.
805.3	**Understand** the concept of labeling.
805.4	**Understand** the concept of solubility, enhancement of solubility, saponification, dissolution, extraction, mixing etc.
805.5	**Develope** the skill for weighing, measuring volume, filtration, dissolution, sterring, p H adjustment, distillation, extraction, mixing, trituration, sieving, transferring the contents from morter to container , aseptic procedures, filling and silling the container etc.
805.6	**Do** evaluation of different dosage forms.

Class: First Year D. Pharmacy Year: I Course name: Pharmaceutical Chemistry I [806]	
Upon completion of the course, the learner shall be able to:	
CO. No.	**Course Outcome**
806.1	**Compare** different theories of acids and bases.
806.2	**Acquire** knowledge on inorganic pharmaceuticals including antioxidants, Gastrointestinal agents, topical agents and dental products**.**
806.3	**Classify** Inhalants, Respiratory stimulants, Antidotes, Expectorants and Emetics.
806.4	**Appreciate** the pharmaceutical aspects of Major Intra – Extra cellular Electrolytes and radio opaque contrast media.
806.5	**Explain** the concepts of quality control tests including Impurities.
806.6	**Choose** the inorganic pharmaceuticals used in preventing and Curing diseases.

Class: First Year D. Pharmacy Year: I Course name: Pharmaceutical Chemistry-I (Practical)	
Upon completion of the course, the learner shall be able to:	
CO. No.	**Course Outcome**
806.1	**Adjudge** the level of specific impurities in the given inorganic Compounds by performing different limit tests.
806.2	**Apply** the identification tests.
806.3	**Perform** test for purity
806.4	**Perform** Preparation of inorganic pharmaceuticals.

Class: First Year D. Pharmacy Year: I Course name: Pharmacognosy Theory (807)	
Upon completion of the course, the learner shall be able to:	
CO. No.	**Course Outcome**
807.1	**Acquire** the knowledge of basics of Pharmacognosy like history, scope & Various indigenous system of medicine.
807.2	**Classify** the natural origin drugs.
807.3	**Understand** the drug adulteration and evaluation processes.
807.4	**Outline** the occurrence, distribution, isolation, identification tests, therapeutic effects and pharmaceutical applications of alkaloids, terpenoids, glycosides, volatile oils, tannins and resins.
807.5	**Illustrate** on source, preparation and identification of fibers used in sutures and surgical dressings .
807.6	**Understand** the collection and preparation of crude drugs for market as exemplified by Ergot, Opium, Rauwolfia, Digitalis And Senna.
807.7	**Emphasize** the crude drug with respect to their occurrence, distribution, organoleptic evaluation, microscopy, chemical constituents including test, and therapeutic efficacy of different categories.

Class: First Year D. Pharmacy Year: I Course name: Pharmacognosy Practical(807)	
Upon completion of the course, the learner shall be able to:	
CO. No.	**Course Outcome**
807.1	**Know** about compound microscope, various techniques of section cutting, staining , mounting and the various micro chemical reagents.
807.2	**Know** about morphological and microscopically characteristics of Cinchona bark, cinnamon bark, clove bud, coriander fruit, datura leaf, fennel fruit, ginger rhizomes, ipecacuanha root, nux vomica seed and Senna leaf.
807.3	**Identify** the crude drugs with respect to their morphological study.
807.4	**Identify** the unorganized crude drugs with the help of chemical tests.

Class: First Year D. Pharmacy Year: I Course name: Biochemistry and Clinical Pathology Theory (808)	
Upon completion of the course, the learner shall be able to:	
CO. No.	**Course Outcome**
808.1	**Remember** the properties, biological significance and metabolic reactions of carbohydrates, amino acids, proteins and lipids.
808.2	**Understand** the biological role of vitamins, minerals and hormones.
808.3	**Apply** the concept of catalytic activity and enzyme inhibition in design of new drugs and factors affecting enzyme action.
808.4	**Distinguish** the phases and mechanism of detoxification.
808.5	**Appraise** the principles and clinical significance involved in the analysis of blood and urine samples
808.6	**Discuss** the metabolism of carbohydrates, amino acids, proteins and lipids in the body.

Class: First Year D. Pharmacy Year: I Course name: Biochemistry and Clinical Pathology Practical (808)	
Upon completion of the course, the learner shall be able to:	
CO. No.	**Course Outcome**
808.1	**Understand** the qualitative analysis of carbohydrate, protein, lipid and amino acids.
808.2	**Estimate** the quantity of abnormal constituents from blood and urine .
808.3	**Examine** the constituents present in blood and urine and its clinical significance.
808.4	**Elaborate** microscopical examination of sputum and faeces.

Class: First Year D. Pharmacy Year: I Course name: Human Anatomy & Physiology I [809]	
Upon completion of the course, the learner shall be able to:	
CO. No.	**Course Outcome**
809.1	**Understand** the relevance and significance of Human Anatomy and Physiology to Pharmaceutical Sciences.
809.2	**Understand** the basic terminologies used in anatomy and physiology as Well as prefixes & suffixes used to identify body parts and directional Terms.
809.3	**Understand** the anatomy, physiology & disorders of skeletal muscle, Smooth muscle & various body systems.
809.4	**Clarify** the anatomy and physiology of various sense organs involved in Body homeostasis.

Class: First Year D. Pharmacy Year: I Course name: Human Anatomy & Physiology (Practical)	
Upon completion of the course, the learner shall be able to:	
CO. No.	**Course Outcome**
809.1	**Understand** the significance of Bleeding time, Blotting time, Blood Group Detection, Haemoglobin detection and measurement of blood Pressure**.**
809.2	**Skill and technique** development in the field of diagnostic tests related blood profile, for eg: Blood group identification, estimation of Haemoglobin, etc.
809.3	**Demonstrate** of human axial and appendicular skeleton system with the Help of bones.
809.4	**Explain** the structure, function, properties, importance & physiology of Various body systems.
809.5	**Explain** the microscopic structure of body tissue & organ with the help of Charts, Models and Slides

Class: First Year D. Pharmacy Year: I Course name: Health Education & Community Pharmacy [810]	
Upon completion of the course, the learner shall be able to:	
CO. No.	**Course Outcome**
810.1	Know about concept of health.
810.2	Principle of microbiology, microbes, Staining technique.
810.3	Know about demography, nutrition, diet and health.
810.4	Know about first aid in different types of shocks.
810.5	Know about environment and health. Types of pollutions and there control measures.
810.6	Gain knowledge about the different types of communicable and non- communicable diseases. Diseases control and prevention
810.7	Know about the Medical entomology, epidemiology, Immunity and immunization Immunological products.