



GRY INSTITUTE OF PHARMACY

BORAWAN, KHARGONE

(Approved by AICTE & PCI; Affiliated to RGPV; Recognized by Govt. of M.P.)

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2.6.1 Programme and course outcomes for all programmes offered by the institution are stated and displayed on website and communicated to teachers and students

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GRY Institute of Pharmacy, Borawan

Course Outcome

M. Pharmacy

Pharmaceutics (I Semester)

Subject Code	Subject
MPH101T	MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES
MPH102T	DRUG DELIVERY SYSTEMS
MPH103T	MODERN PHARMACEUTICS
MPH104T	REGULATORY AFFAIRS

Subject: MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES **Subject Code:** MPH101T

	Course Outcome
CO-01	Analytical instrumental techniques for identification, characterization and quantification of drugs
CO-02	The analysis of various drugs in single and combination dosage forms
CO-03	Theoretical and practical skills of the instruments like UV, IR, MASS etc
CO-04	The analysis of various Chemicals and Excipients

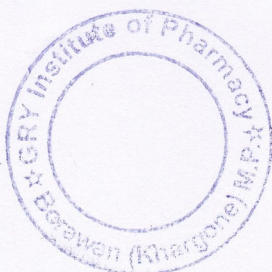
Subject: DRUG DELIVERY SYSTEMS


Subject Code: MPH102T

	Course Outcome
CO-01	This course is designed to impart knowledge on the area of advances in novel drug delivery systems
CO-02	The various approaches for development of novel drug delivery systems.
CO-03	The criteria for selection of drugs and polymers for the development of delivering system
CO-04	The formulation and evaluation of Novel drug delivery systems

Subject: MODERN PHARMACEUTICS **Subject Code:** MPH103T

	Course Outcome
CO-01	To impart advanced knowledge and skills required to learn various aspects and concepts at pharmaceutical industries
CO-02	The elements of preformulation studies
CO-03	The Active Pharmaceutical Ingredients and Generic drug Product development
CO-04	Industrial Management and GMP Considerations
CO-05	Optimization Techniques & Pilot Plant Scale Up Techniques
CO-06	Stability Testing, sterilization process & packaging of dosageforms.




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Subject: REGULATORY AFFAIRS

Subject Code: MPH104T

	Course Outcome
CO-01	To impart advanced knowledge and skills required to learn the concept of generic drug and their development, various regulatory filings in different countries, different phases of clinical trials and submitting regulatory documents : filing process of IND, NDA and ANDA
CO-02	To know the chemistry, manufacturing controls and their regulatory importance
CO-03	To learn the documentation requirements for the approval process

Course Outcome
M. Pharmacy
Pharmaceutics (II Semester)

Subject Code	Subject
MPH201T	MOLECULAR PHARMACEUTICS (NANO TECHNOLOGY & TARGETED DDS) (NTDS)
MPH202T	ADVANCED BIOPHARMACEUTICS & PHARMACOKINETICS
MPH203T	COMPUTER AIDED DRUG DEVELOPMENT
MPH204T	COSMETICS AND COSMECEUTICALS

Subject: MOLECULAR PHARMACEUTICS (NANO TECHNOLOGY & TARGETED DDS) (NTDS)

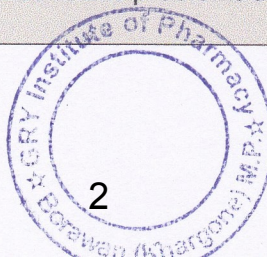
Subject Code: MPH201T

	Course Outcome
CO-01	To impart knowledge on the area of advances in novel drug delivery systems.
CO-02	The various approaches for development of novel drug delivery systems
CO-03	The criteria for selection of drugs and polymers for the development of NTDS
CO-04	The formulation and evaluation of novel drug delivery systems

Subject: ADVANCED BIOPHARMACEUTICS & PHARMACOKINETICS

Subject Code: MPH202T

	Course Outcome
CO-01	To impart knowledge and skills necessary for dose calculations, dose adjustments
CO-02	To apply biopharmaceutics theories in practical problem solving.
CO-03	The use raw data and derive the pharmacokinetic models and parameters the best describe the process of drug absorption, distribution, metabolism and elimination.
CO-04	The critical evaluation of biopharmaceutic studies involving drug product equivalency.
CO-05	The design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.
CO-06	The potential clinical pharmacokinetic problems and application of basics of pharmacokinetic



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Subject: COMPUTER AIDED DRUG DEVELOPMENT **Subject Code:** MPH203T

	Course Outcome
CO-01	To impart knowledge and skills necessary for computer Applications in pharmaceutical research and development
CO-02	To understand the application of computers across the entire drug research and development process
CO-03	History of Computers in Pharmaceutical Research and Development
CO-04	Computational Modeling of Drug Disposition
CO-05	Computers in Preclinical Development
CO-06	Optimization Techniques in Pharmaceutical Formulation
CO-07	Computers in Market Analysis
CO-08	Computers in Clinical Development
CO-09	Artificial Intelligence (AI) and Robotics
CO-10	Computational fluid dynamics(CFD

Subject: COSMETICS AND COSMECEUTICALS

Subject Code: MPH204T

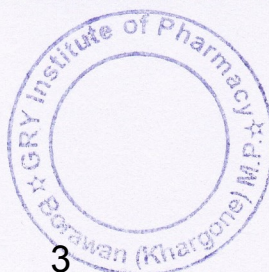
	Course Outcome
CO-01	To impart knowledge and skills necessary for the fundamental need for cosmetic and cosmeceutical products
CO-02	To understand key ingredients used in cosmetics and cosmeceuticals
CO-03	To understand Key building blocks for various formulations
CO-04	To understand Current technologies in the market
CO-05	To understand Various key ingredients and basic science to develop cosmetics and cosmeceuticals
CO-06	Scientific knowledge to develop cosmetics and cosmeceuticals with desired Safety, stability, and efficacy.


Course Outcome

M. Pharmacy

Pharmaceutical Chemistry (I Semester)

Subject Code	Subject
MPC101T	MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES
MPC102T	ADVANCED ORGANIC CHEMISTRY - I
MPC103T	ADVANCED MEDICINAL CHEMISTRY
MPC104T	CHEMISTRY OF NATURAL PRODUCTS




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Subject: MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Subject Code: MPH101T

	Course Outcome
CO-01	Analytical instrumental techniques for identification, characterization and quantification of drugs
CO-02	The analysis of various drugs in single and combination dosage forms
CO-03	Theoretical and practical skills of the instruments like UV, IR, MASS etc
CO-04	The analysis of various Chemicals and Excipients

Subject: ADVANCED ORGANIC CHEMISTRY - I **Subject Code:** MPC102T

	Course Outcome
CO-01	To provide in-depth knowledge about advances in organic chemistry, different techniques of organic synthesis and their applications to process chemistry as well as drug discovery
CO-02	To understand the principles and applications of retrosynthesis
CO-03	To understand the mechanism & applications of various named reactions
CO-04	To understand the concept of disconnection to develop synthetic routes for small target molecule
CO-05	To understand the various catalysts used in organic reactions
CO-06	To understand the chemistry of heterocyclic compounds

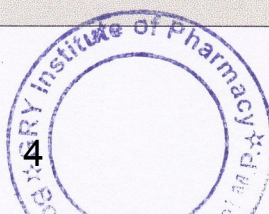
Subject: ADVANCED MEDICINAL CHEMISTRY


Subject Code: MPC103T

	Course Outcome
CO-01	To impart knowledge about recent advances in the field of medicinal chemistry at the molecular level including different techniques for the rational drug design.
CO-02	To understand the Different stages of drug discovery
CO-03	To understand the Role of medicinal chemistry in drug research
CO-04	To understand the Different techniques for drug discovery
CO-05	To understand the Various strategies to design and develop new drug like molecules for biological targets
CO-06	To understand the Peptidomimetics

Subject: CHEMISTRY OF NATURAL PRODUCTS **Subject Code:** MPC104T

	Course Outcome
CO-01	To provide detail knowledge about chemistry of medicinal compounds from natural origin and general methods of structural elucidation of such compounds
CO-02	To understand the isolation, purification and characterization of medicinal compounds from natural origin.
CO-03	To understand the Different types of natural compounds and their chemistry and medicinal importance
CO-04	To understand the importance of natural compounds as lead molecules for new drug discovery
CO-05	To understand the concept of rDNA technology tool for new drug discovery
CO-06	To understand the General methods of structural elucidation of compounds of natural origin




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Course Outcome

M. Pharmacy

Pharmaceutical Chemistry (II Semester)

Subject Code	Subject
MPC201T	ADVANCED SPECTRAL ANALYSIS
MPC202T	ADVANCED ORGANIC CHEMISTRY - II
MPC203T	COMPUTER AIDED DRUG DESIGN
MPC204T	PHARMACEUTICAL PROCESS CHEMISTRY

Subject: ADVANCED SPECTRAL ANALYSIS

Subject Code: MPC201T

	Course Outcome
CO-01	To understand the hyphenated analytical instrumental techniques for identification, characterization and quantification of drugs.
CO-02	To understand the Interpretation of the NMR, Mass and IR spectra of various organic compounds
CO-03	To understand the Theoretical and practical skills of the hyphenated instruments
CO-04	To understand the Identification of organic compounds

Subject: ADVANCED ORGANIC CHEMISTRY - II

Subject Code: MPC202T

	Course Outcome
CO-01	To provide in-depth knowledge about advances in organic chemistry, different techniques of organic synthesis and their applications to process chemistry as well as drug discovery
CO-02	To understand the principles and applications of Green chemistry
CO-03	To understand the concept of peptide chemistry
CO-04	To understand the various catalysts used in organic reactions
CO-05	To understand the concept of stereochemistry and asymmetric synthesis

Subject: COMPUTER AIDED DRUG DESIGN

Subject Code: MPC203T

	Course Outcome
CO-01	To impart knowledge on the current state of the art techniques involved in computer assisted drug design.
CO-02	To understand the Role of CADD in drug discovery
CO-03	To understand the Different CADD techniques and their applications
CO-04	To understand the Various strategies to design and develop new drug like molecules.
CO-05	To understand the Working with molecular modeling softwares to design new drug molecules
CO-06	To understand the in silico virtual screening protocols



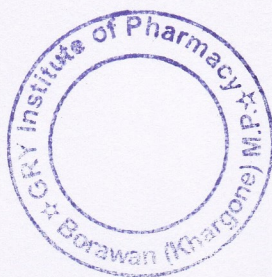
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Subject: PHARMACEUTICAL PROCESS CHEMISTRY

Subject Code: MPC204T

	Course Outcome
CO-01	The goal of a process chemist is to develop synthetic routes that are safe, cost-effective, environmentally friendly, and efficient
CO-02	To impart knowledge on the development and optimization of a synthetic route/s and the pilot plant procedure for the manufacture of Active Pharmaceutical Ingredients (APIs) and new chemical entities (NCEs) for the drug development phase.
CO-03	To understand the strategies of scale up process of APIs and intermediates
CO-04	To understand the various unit operations and various reactions in process chemistry



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Course Outcome

B. Pharmacy (I Semester)

Subject Code	Subject
BP101T	HUMAN ANATOMY AND PHYSIOLOGY-I
BP102T	PHARMACEUTICAL ANALYSIS (Theory)
BP103T	PHARMACEUTICS- I (Theory)
BP104T	PHARMACEUTICAL INORGANIC CHEMISTRY (Theory)
BP105T	COMMUNICATION SKILLS (Theory)
BP 106RBT	REMEDIAL BIOLOGY
BP 106RMT	REMEDIAL MATHEMATICS

Subject: HUMAN ANATOMY AND PHYSIOLOGY-I

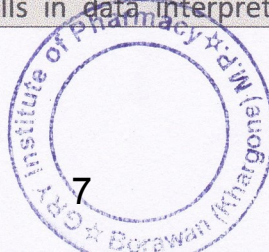
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
	Course Outcome
CO-01	Explain the gross morphology, structure and functions of various organs of the human body.
CO-02	Describe the various homeostatic mechanisms and their imbalances and explain coordinated working pattern of different organs of each system.
CO-03	Clarify various tissues and organs of different systems of human body.
CO-04	Describe various experiments related to special senses and nervous system.
CO-05	To identify the various tissues and organs of different systems of human body.
CO-06	To perform the various experiments related to special senses and nervous system
CO-07	To describe the various homeostatic mechanisms and their imbalances.
CO-08	To study the maintenance of normal functioning of human body

Subject: PHARMACEUTICAL ANALYSIS

Subject Code: BP102T

	Course Outcome
CO-01	To study fundamentals of pharmaceutical analysis and pharmacopoeia
CO-02	Understand basic concepts involved in errors and to know the sources of impurities and methods to determine the impurities.
CO-03	Clarify need and basic principles of Acid Base titration, non aqueous titration, complexometric titration, precipitation titrations, gravimetric analysis etc for the determination of percentage purity of drugs.
CO-04	Illustrate principle, types of electrode, instrumentation and applications of Potentiometry, Conductometry and Polarography
CO-05	To gain information about the qualitative and quantitative composition of substances and species, that is to find out what a substance is composed of and exactly how much. This information guides development of the manufacturing operation and therapeutic action of drugs.
CO-06	To get acquainted to basic apparatus and instruments and their calibration. and Understand concept of various volumetric analysis
CO-07	To develop analytical skills in data interpretation and calculations.




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Subject: PHARMACEUTICS

Subject Code: BP103T

	Course Outcome
CO-01	To Know the history of profession of pharmacy
CO-02	Understand the professional way of handling the prescription
CO-03	Understand the basics of different dosage forms, pharmaceutical incompatibilities
CO-04	To understand pharmaceutical calculations
CO-05	Understand formulation and evaluation of Pharmaceutical solution.
CO-06	Understand formulation and evaluation of Pharmaceutical dispersed system.
CO-07	Understand formulation and evaluation of pharmaceutical powders.
CO-08	Understand formulation and evaluation of semisolid dosage form.

Subject: PHARMACEUTICAL INORGANIC CHEMISTRY

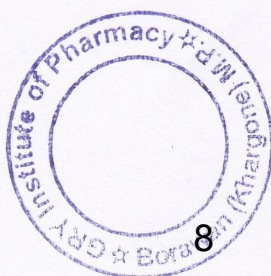
Subject Code: BP104T


	Course Outcome
CO-01	Knowledge of sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals
CO-02	Understanding of the basic concepts of acidity/basicity, buffers and tonicity applicable in pharmaceuticals
CO-03	Understanding of the medicinal and pharmaceutical Importance of inorganic compounds
CO-04	Understanding of concepts and principles of radiopharmaceuticals
CO-05	Understanding concepts regarding acidifiers and antacids
CO-06	Developed skills to perform limit test for given sample
CO-07	Perform identification of inorganic salts through various qualitative tests
CO-08	Ability to perform tests for purity for different compounds as per IP

Subject: COMMUNICATION SKILLS

Subject Code: BP105T

	Course Outcome
CO-01	Understand the behavioral needs for Pharmacist to function effectively in the areas of pharmaceutical operation.
CO-02	Communicate effectively (Verbal and Non-verbal).
CO-03	Effectively manage the team as a team player.
CO-04	Develop interview skills
CO-05	Develop leadership qualities and essentials.
CO-06	Understand the role of communication in personal and professional life.




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Subject: REMEDIAL BIOLOGY

Subject Code: BP106RBT

	Course Outcome
CO-01	Knowledge of Living world and morphology of flowering plant.
CO-02	Understanding the concept of Body fluids, digestion and respiration
CO-03	Understanding concepts regarding Human reproduction
CO-04	Understanding the unit of life and plant nutrition
CO-05	Developed skills to understand handling of Microscope
CO-06	Knowledge and skills to prepare permanent slides
CO-07	Demonstration of frog by computer model
CO-08	Performed determination of blood pressure and blood group

Subject: REMEDIAL MATHEMATICS

Subject Code: BP106RBT

	Course Outcome
CO-01	Know the theory and their application in Pharmacy
CO-02	Solve the different types of problems by applying theory
CO-03	Appreciate the important application of mathematics in Pharmacy
CO-04	Know to solve analytical problem in Pharmacy
CO-05	Know to solve Statistical problems in Pharmacy

Course Outcome

B. Pharmacy (II Semester)


SUB. CODE	SUBJECT
BP201T	HUMAN ANATOMY AND PHYSIOLOGY-II
BP202T	PHARMACEUTICAL ORGANIC CHEMISTRY-I
BP203T	BIOCHEMISTRY
BP204T	PATHOPHYSIOLOGY
BP205T	COMPUTER APPLICATION IN PHARMACY
BP206T	ENVIRONMENTAL SCIENCE

Subject: HUMAN ANATOMY AND PHYSIOLOGY-II

Subject Code: BP201T

	Course Outcome
CO-01	Explain the gross morphology, structure and functions of various organs of the human body
CO-02	Describe the various homeostatic mechanisms and their imbalance
CO-03	Explain the various tissues and organs of different systems of human body with coordinated working pattern of different organs of each system
CO-04	Explain the interlinked mechanism in the maintenance of normal functioning of human body.




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Subject: PHARMACEUTICAL ORGANIC CHEMISTRY-I

Subject Code: BP202T

	Course Outcome
CO-01	Understanding of important physical properties, general reaction and mechanism of basic reactions like substitution, elimination, addition etc and methods of preparation of various functional groups
CO-02	Knowledge of the classification, nomenclature (Common and IUPAC) & structure of organic compound
CO-03	Knowledge of isomers & type of isomerism of the organic compound
CO-04	Account for reactivity/stability of compounds and intermediates forming in reactions
CO-05	Knowledge of safety measures in organic chemistry laboratory and various laboratory techniques
CO-06	Ability to Identify/confirm the organic compounds on the basis of important identification tests like Preliminary tests, Lassaigne's & Solubility test
CO-07	Ability to prepare suitable solid derivatives from organic compounds.
CO-08	Ability to determine the important characteristic properties of organic compound like melting point and Boiling point
CO-09	Develop skills to prepare stereo models containing various functional groups

Subject: BIOCHEMISTRY

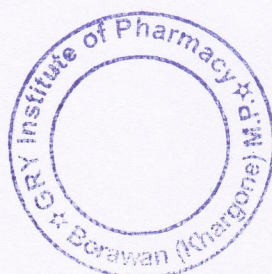
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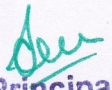
	Course Outcome
CO-01	Knowledge of Biomolecules and bioenergetics
CO-02	Understanding of the basic concepts of carbohydrate, lipids, amino acid and their metabolism.
CO-03	Understanding of the Nucleic acid metabolism and genetic information transfer.
CO-04	Understanding concepts regarding enzymes
CO-05	Developed skills to perform qualitative analysis of carbohydrates and protein
CO-06	Perform the effect of temperature and substrate concentration on salivary amylase activity
CO-07	Ability to prepare buffer system and measurement of pH
CO-08	Knowledge and skills to determine blood sugar

Subject: PATHOPHYSIOLOGY

Subject Code: BP204T

	Course Outcome
CO-01	Describe the etiology and pathogenesis of the selected disease states
CO-02	Describe the signs and symptoms of the diseases
CO-03	Explain the complications of the diseases




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Subject: COMPUTER APPLICATION IN PHARMACY

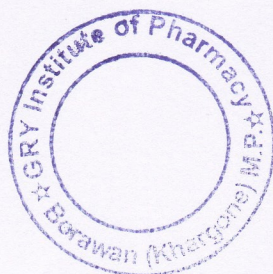
Subject Code: BP205T


	Course Outcome
CO-01	Basic and advanced Knowledge of computer
CO-02	Knowledge of Hardware and Software
CO-03	Knowledge of the various types of application of computer in pharmacy.
CO-04	Knowledge of the various types Database and its uses in pharmacy
CO-05	Knowledge of the various Application of Databases in pharmacy
CO-06	Knowledge of the various Application software that are used in different department of pharmacy

Subject: ENVIRONMENTAL SCIENCE

Subject Code: BP206T

	Course Outcome
CO-01	Student should be able to Create the awareness about environmental problems among learners.
CO-02	Student should be able to Impart basic knowledge about the environment and its allied problems.
CO-03	Student should be able to Develop an attitude of concern for environment.
CO-04	Student should be able to Motivate learner to participate in environment protection and environment improvement.
CO-05	Student should be able to Acquire skills to help the concerned individuals in identifying and solving environmental problems.
CO-06	Student should be able to Strive to attain harmony with nature.




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Course Outcome

B. Pharmacy (III Semester)

SUB. CODE	SUBJECT
BP301T	PHARMACEUTICAL ORGANIC CHEMISTRY-II
BP302T	PHYSICAL PHARMACEUTICS-I
BP303T	PHARMACEUTICAL MICROBIOLOGY
BP304T	PHARMACEUTICAL ENGINEERING

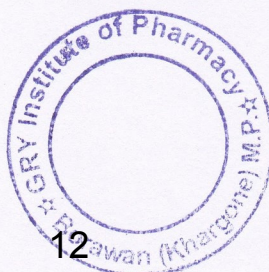
SUBJECT: PHARMACEUTICAL ORGANIC CHEMISTRY-II SUBJECT CODE: BP301T

	Course Outcome
CO-01	Understand the introduction, orbital picture, resonance, and effects of substituent's on further substitution on benzene
CO-02	Write the structure, name and medicinal use of concerned organic compounds in the course
CO-03	Special emphasis on mechanisms and orientation of chemical reactions of organic compounds
CO-04	Explain acidity, effect of substituents, and qualitative test of phenols & Aromatic acids. Also elucidate basicity, effect of substituent's, of aromatic amines
CO-05	Understand the chemistry of fatty acids. Also covers theoretical and practical knowledge of significance, principle and determination of important analytical constants of fats and oils
CO-06	Knowledge of synthesis and reactions polynuclear hydrocarbons.
CO-07	Explain the reactions and important theories explains reactivity and stability of cycloalkanes
CO-08	Demonstration of recrystallization and Steam distillation
CO-09	Determine the analytical constants of oil/fat sample
CO-10	Synthesize the different organic compounds and understand the reaction mechanisms

SUBJECT: PHYSICAL PHARMACEUTICS-I

SUBJECT CODE: BP302T

	Course Outcome
CO-01	Recognize the Solubility phenomenon, factor influencing the solubility, diffusion principles in biological system, phase rule and applications of distribution law
CO-02	Understand the different matter properties, physical and chemical properties of the drugs molecules with their application
CO-03	Distinguish the concept of surface tension and interfacial tension between different states, adsorption of liquid and gas on adsorbate.
CO-04	Distinguish the principles of complexation/ protein binding; know the types of complexation with their application
CO-05	Understand the role of pH and buffer in the dosage forms



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SUBJECT: PHARMACEUTICAL MICROBIOLOGY

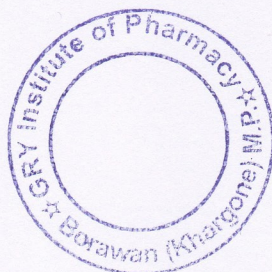
SUBJECT CODE: BP303T


	Course Outcome
CO-01	Understand methods of identification, cultivation and preservation of various microorganisms
CO-02	To understand the importance and implementation of sterilization in pharmaceutical processing and industry
CO-03	Learn sterility testing of pharmaceutical products
CO-04	Carried out microbiological standardization of Pharmaceuticals.
CO-05	To understand the importance and implementation and evaluation of disinfectant in pharmaceutical industry
CO-06	Understand the cell culture technology and its applications in pharmaceutical industries
CO-07	Understand methods of clean area and aseptic area classification
CO-08	Knowledge and working of laminar air flow bench

Subject: PHARMACEUTICAL ENGINEERING

Subject Code: BP304T

	Course Outcome
CO-01	To know various unit operations used in Pharmaceutical industries, understand the material handling techniques
CO-02	To perform various processes involved in pharmaceutical manufacturing process, carry out various tests to prevent environmental pollution
CO-03	To appreciate and comprehend significance of plant lay out design for optimum use of resources
CO-04	To appreciate the various preventive methods used for corrosion control in Pharmaceutical industries




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Course Outcome

B. Pharmacy (IV Semester)

SUB. CODE	SUBJECT
BP401T	PHARMACEUTICAL ORGANIC CHEMISTRY-III
BP402T.	MEDICINAL CHEMISTRY – I
BP403T.	PHYSICAL PHARMACEUTICS-II (
BP404T.	PHARMACOLOGY-I
BP405T.	PHARMACOGNOSY AND PHYTOCHEMISTRY I

SUBJECT: PHARMACEUTICAL ORGANIC CHEMISTRY-III

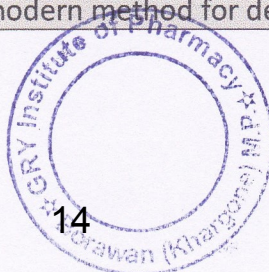
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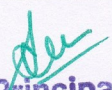
Course Outcome	
CO-01	Understand the introduction, orbital picture, resonance, reactions and effects of substituent's of benzene. Explain acidity, effect of substituents, reaction and qualitative test of phenols. Also elucidate basicity, effect of substituents, reaction of aromatic amines
CO-02	Knowledge of synthesis, reactions and structure and medicinal uses of some polynuclear hydrocarbons
CO-03	Understand the theory of cycloalkanes and chemistry of fats and oils.
CO-04	Explain the optical isomerism and geometrical isomerism of organic compounds. Clarify the concept of resolution of racemic modifications

SUBJECT: MEDICINAL CHEMISTRY – I

SUBJECT CODE: BP402T

Course Outcome	
CO-01	Explain the influence of physicochemical properties on drug action.
CO-02	Define; explain types and applications of bioisosterism
CO-03	Discuss receptor types and forces involved in drug receptor interactions
CO-04	Explain the influence of the metabolic profile of drugs and their impact on biological system
CO-05	Outline the synthetic route for the selective medicinal compounds of each category and acquire knowledge on the mechanism of action of pharmacodynamics agents.
CO-06	Assimilate the therapeutic uses of adrenergic agents, cholinergic Agents and CNS agent's classification, synthesis and therapeutic uses and side effects of drugs.
CO-07	Discuss the relationship between the structures activity of medicinal compounds and their biological activity
CO-08	Understand how to improve drug efficiency & effectively with minimum adverse effect & side effects
CO-09	Draw the reaction mechanism involved in the synthesis of compounds
CO-10	Perform the procedure of purification and physical characterization of synthesized Compound
CO-11	Understand how to improve drug efficiency & effectively with minimum adverse effect & side effects
CO-12	Instrument handling & use modern method for designing for new drug.




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SUBJECT: PHYSICAL PHARMACEUTICS-II

SUBJECT CODE: BP403T

	Course Outcome
CO-01	Relate various physicochemical properties of drug and excipient molecules in designing the dosage forms
CO-02	Distinguish the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
CO-03	Demonstrate use of physicochemical properties in evaluation of dosage forms
CO-04	Understand physicochemical properties of drug molecules in formulation, research and development
CO-05	Gain the knowledge of particle size analysis and surface area determination methods
CO-06	Determine viscosity of fluids and study application of it to colloid stability
CO-07	Apply the knowledge of chemical kinetics in drug stability
CO-08	To understand the stability of sols
CO-09	To Determine powder flow properties

SUBJECT: PHARMACOLOGY-I

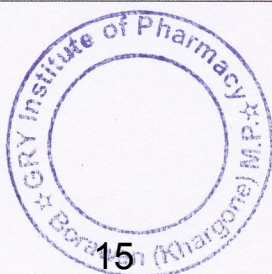
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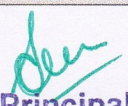
	Course Outcome
CO-01	Understand the pharmacological actions of different categories of drugs
CO-02	Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels
CO-03	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases
CO-04	Observe the effect of drugs on animals by simulated experiments
CO-05	Observe the effect of drugs on animals by simulated experiments
CO-06	Appreciate correlation of pharmacology with other bio medical science

SUBJECT: PHARMACOGNOSY AND PHYTOCHEMISTRY I

SUBJECT CODE: BP405T

	Course Outcome
CO-01	Comprehend and explain Primary and secondary metabolites from source to their industrial applications.
CO-02	Explain meaning & significance of Pharmacognostic parameters and pharmacognostic scheme of study of crude drugs.
CO-03	Explain properties, methods of extraction, pharmaceutical and industrial applications of carbohydrates, lipids and proteins and their derived products.
CO-04	Explain properties, methods of extraction, and systematic pharmacognostic study of crude drugs from Glycosides and Tannins.
CO-05	Able to understand morphology, microscopy and powder characteristics of crude drugs.
CO-06	Able to identify unorganized drugs by chemical methods
CO-07	Able to determine the quality of unorganized crude drugs
CO-08	Able to conduct extraction and estimation of different phytoconstituents.




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Course Outcome

B. Pharmacy (V Semester)

Sub. Code	Subject
BP501T	MEDICINAL CHEMISTRY – II
BP502T.	INDUSTRIAL PHARMACY-I
BP503T.	PHARMACOLOGY-II
BP504T.	PHARMACOGNOSY AND PHYTOCHEMISTRY II
BP505T.	PHARMACEUTICAL JURISPRUDENCE

SUBJECT: MEDICINAL CHEMISTRY – II

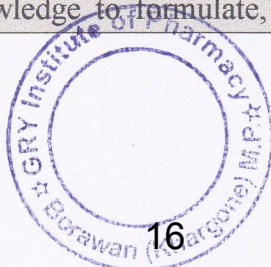
SUBJECT CODE: BP501T

	Course Outcome
CO-01	Classify medicinal compounds according to their chemical structure.
CO-02	Identify the effect of physicochemical properties on biological action and drug metabolic pathways.
CO-03	Explain the mode of action, synthesis and therapeutic uses and side effects of drugs.
CO-04	Discuss the relationship between the structures of medicinal compounds and their biological activity.
CO-05	Discuss the pharmacological actions and adverse effects of medicinal compounds.
CO-06	Apply the principles of synthetic chemistry to predict the synthesis of drug molecules.
CO-07	Knowledge & skill to operate Auto-Dock & Molegro software for designing of new drug structure, chemistry & therapeutic value of drugs.
CO-08	Understand how to improve drug efficiency & effectively with minimum adverse effect & side effects.
CO-09	Knowledge and skills to prepare inorganic salts-boric acid ,potash alum and ferrous sulphate.
CO-10	Being a public survey to interact with the medical pharmacist in a better way to understand recent marketed product and complain of people to make them feel healthy.
CO-11	Leadership skills: Performing practical in a group.

SUBJECT: INDUSTRIAL PHARMACY-I

SUBJECT CODE: BP502T

	Course Outcome
CO-01	Know the various pharmaceutical dosage forms and their manufacturing techniques
CO-02	Know various considerations in development of pharmaceutical dosage forms
CO-03	Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality
CO-04	Describe tablets dosage form, physico-chemical principles, different additives used for formulation, manufacturing, evaluation and defect in tableting with remedies.
CO-05	Describe capsule dosage form. Explain the different types, additives, size selection, manufacturing, evaluation, equipment and defect of capsules.
CO-06	Explain pharmacopoeial specification. Explain requirement of coating, techniques & Equipment used in tablet coating.
CO-07	Able to perform preformulation studies of tablets andcapsule
CO-08	Understand the knowledge to formulate, evaluate and label of tablets and capsules




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SUBJECT: PHARMACOLOGY-II

SUBJECT CODE: BP503T

Course Outcome	
CO-01	Understand the guidelines for animal experimentations and develop skills of various routes of drug administration, methods for blood collection from experimental animals.
CO-02	Learn the composition of physiological salt solutions and basic instruments used in experimental pharmacology.
CO-03	Perform experiments using various isolated preparation and the effects of different drugs on the concentration response curves.
CO-04	Study the action of various drugs using preclinical models/computer simulations.
CO-05	To understand the use of isolated tissue preparation for antagonistic bioassay methods.
CO-06	Demonstrate isolation of different organ/tissue from the laboratory animal by simulated experiments.
CO-07	Demonstrate the various receptor action using isolated tissue preparation.
CO-08	Appreciate correlation of pharmacology with related medical sciences.

SUBJECT: PHARMACOGNOSY AND PHYTOCHEMISTRY II

SUBJECT CODE: BP504T

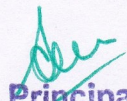
Course Outcome	
CO-01	Understand and explain how the secondary metabolites are produced in crude drug from biosynthetic pathways and its investigation by radioactive isotopes.
CO-02	Understand and explain how to isolate, identified and produced various Phytochemical industrially.
CO-03	Explain properties, methods of extraction, chemical class, pharmaceutical and industrial applications of cardiac glycosides, alkaloids, volatile oil and Flavonoids and their derived products.
CO-04	Understand and explain various physical, chemical, spectroscopical and chromatography methods used in characterization and determination of carbon skeleton of natural products.
CO-05	Comprehend & explain underlying principle, various methods of extraction processes and applications.
CO-06	Able to understand morphology, microscopy and powder characteristics of crude drugs.
CO-07	Able to conduct extraction and estimation of different phytoconstituents.
CO-08	Able to perform Isolation and detection of Phytoconstituents of Volatile Oils, Alkaloids and Glycosides.

SUBJECT: PHARMACEUTICAL JURISPRUDENCE

SUBJECT CODE: BP505T

Course Outcome	
CO-01	Illuminate relevance and significance of jurisprudence to pharmaceutical Sciences.
CO-02	Fundamentals of legislation to regulate import manufacture, distribution and sales of drug and cosmetics
CO-03	Brief study of legislation
CO-04	Concepts of intellectual property right patent system, drug regulatory affairs etc.




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Course Outcome

B. Pharmacy (VI Semester)

Sub. Code	Subject
BP601T	MEDICINAL CHEMISTRY – III
BP602T	PHARMACOLOGY-III
BP603T	HERBAL DRUG TECHNOLOGY
BP604T	BIOPHARMACEUTICS AND PHARMACOKINATICS
BP605T	PHARMACEUTICAL BIOTECHNOLOGY
BP606T	PHARMACEUTICAL QUALITY ASSURANCE

SUBJECT: MEDICINAL CHEMISTRY – III

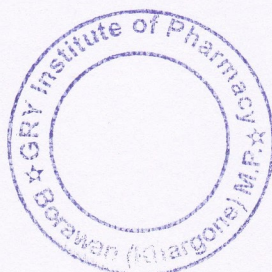
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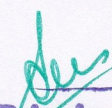
	Course Outcome
CO-01	Understand the importance of the drug design and different techniques of drug design.
CO-02	Understand the chemistry of drug with respect to their biological activity.
CO-03	Know the metabolism, adverse effects and therapeutic value of drugs.
CO-04	Know the Importance of SAR
CO-05	Know the preparation of medicinally important compound.
CO-06	Understand the CADD and software for drawing structure, analyze the different properties of drug.

SUBJECT: PHARMACOLOGY-III

SUBJECT CODE: BP602T

	Course Outcome
CO-01	Describe the pharmacology and pharmacotherapy of various general and local anesthetics.
CO-02	Illustrate the appropriate drug therapy and management of patients with specific CNS disorders.
CO-03	Explain the indications, mechanism of action, adverse effects and contraindications for the major classes of drugs used in the treatment of Parkinson's Disease, Migraine and Alzheimer's disease.
CO-04	Describe Pharmacological features of different classes of NSAIDs and pharmacotherapy of Rheumatoid Arthritis, Osteoarthritis and Gout.
CO-05	Understand the basic principles of bioassay, types of bioassay along with advantages and disadvantages.
CO-06	Perform isolated experiments using various isolated preparation and the effect of different drugs on the concentration response curves.
CO-07	Study the preclinical screening of various drugs.




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SUBJECT: HERBAL DRUG TECHNOLOGY

SUBJECT CODE: BP603T

	Course Outcome
CO-01	Understand and explain concept of health & pathogenesis, philosophical basis, diagnosis and treatment aspects of Ayurveda, Unani, Siddha and Homoeopathic system of medicine.
CO-02	Understand & explain method of preparation of Ayurvedic dosage forms; significance of novel drug delivery of natural products; herbs used in cosmetic preparation & methods of their formulations.
CO-03	Compare and contrast nutraceuticals and functional foods and understand their significance.
CO-04	Understand and explain methods of herbal drug analysis, Quality control parameter as per WHO guidelines.
CO-05	Understand and realize the significance of natural products in daily life and be able to classify different segments in market, demand and supply position; export and import potential and position of Indian herbal drug industry in global contest.
CO-06	Comprehend and explain government organizations and policies for promotion, their regulation in India & other countries, various regulatory guidelines, patenting and ethical issues etc.
CO-07	Understand and explain safe use of natural products, possible toxicities & interaction, toxicities in most venerable group (elderly patients) and significance of pharmacovigilance systems.

SUBJECT: BIOPHARMACEUTICS AND PHARMACOKINATICS

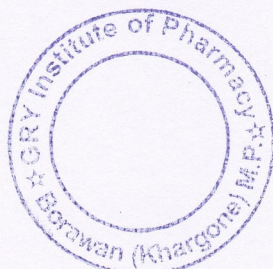
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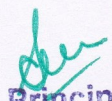
	Course Outcome
CO-01	Understand the concept of biopharmaceutics and its applications in product development. Understand the concept of ADME of drug in human body
CO-02	Learning the concepts of bioavailability and bioequivalence studies. Determine the various pharmacokinetic parameters from either plasma concentration or urinary excretion data for drug.
CO-03	Study the pharmacokinetic processes and their relevance in efficacy of dosage form.
CO-04	Learning various compartmental models.
CO-05	Understand the concept and mechanisms of dissolution and correlation.

SUBJECT: PHARMACEUTICAL BIOTECHNOLOGY

SUBJECT CODE: BP605T

	Course Outcome
CO-01	Understanding the importance of Immobilized enzymes in Pharmaceutical Industries
CO-02	Genetic engineering applications in relation to production of pharmaceuticals
CO-03	Importance of Monoclonal antibodies in Industries
CO-04	Appreciate the use of microorganisms in fermentation technology




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SUBJECT: PHARMACEUTICAL QUALITY ASSURANCE

SUBJECT CODE: BP606T

Course Outcome	
CO-01	The students understand the importance of quality in pharmaceutical products and importance of Good practices of GMP.
CO-02	The process involved in manufacturing of pharmaceuticals different section/department and activity is learnt.
CO-03	The students is explored the quality control environment and understand the good laboratory practices.
CO-04	The various documentation processes is highlighted to the student.
CO-05	The student understand the concept and implementation validation.

Course Outcome

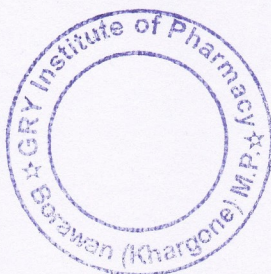
B. Pharmacy (VII Semester)

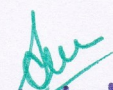
Sub. Code	Subject
BP701T	INSTRUMENTAL METHOD OF ANALYSIS
BP702T	INDUSTRIAL PHARMACY-II
BP703T	PHARMACY PRACTICE
BP704T	NOVEL DRUG DELIVERY SYSTEM

SUBJECT: INSTRUMENTAL METHOD OF ANALYSIS

SUBJECT CODE: BP701T

Course Outcome	
CO-01	Understand the interaction of matter with electromagnetic radiation and its applications in drug analysis
CO-02	Understand the chromatographic separation and analysis of drug.
CO-03	Perform the quantitative & qualitative analysis of drugs using various analytical instruments
CO-04	Demonstrate knowledge of sampling methods for all states of matter.
CO-05	Give the knowledge of sophisticated instruments used for the testing of biological like: Blood serum, Urine.
CO-06	Emphasis the validation and calibration of Pharma analytical instruments used in Quality control of drugs.
CO-07	Understanding principle, instrumentation and applications of IR, UV, HPLC and concept of automated method of analysis
CO-08	Assess sources of errors including impurities in chemical analysis and account for errors in data analysis
CO-09	Optimize the method for the development of analytical method for the determination of API.
CO-10	Understand and able to apply the theory and operational principles of analytical instruments




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SUBJECT: INDUSTRIAL PHARMACY-II

SUBJECT CODE: BP702T

	Course Outcome
CO-01	Discuss the process of pilot plant scale up of pharmaceutical dosage forms.
CO-02	Demonstrate the practice and the process of technology transfer from lab scale to commercial.
CO-03	Explain the different laws and acts that regulate pharmaceutical industry.
CO-04	Describe the approval process and regulatory requirements of drug products.
CO-05	Describe the common measure use in quality.
CO-06	Describe the role and responsibility of regulatory agencies in the approval of drugs.
CO-07	Describe the organization and responsibilities of national and state licensing authority.

SUBJECT: PHARMACY PRACTICE

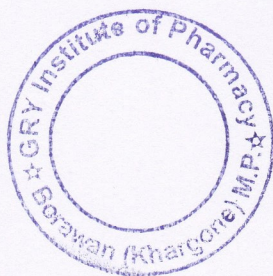
SUBJECT CODE: BP703T

	Course Outcome
CO-01	To understand various drug distribution methods in a hospital
CO-02	To understand the Pharmacy stores management and inventory control.
CO-03	To know how to monitor drug therapy of patient through medication chart review and clinical review.
CO-04	To understand how to counsel the patients.
CO-05	Detect and assess the adverse drug reactions and how to report them.
CO-06	Learn to interpret selected laboratory results.
CO-07	Role and duty of Pharmacist in health sector and public sector
CO-08	Learn to take active participation in PTC meetings and Hospital formulary system

SUBJECT: NOVEL DRUG DELIVERY SYSTEM

SUBJECT CODE: BP704T

	Course Outcome
CO-01	To understand various approaches for development of novel drug delivery systems.
CO-02	To understand the criteria for selection of drugs and polymers for the development of Novel drug delivery systems.
CO-03	Study of Microencapsulation, its Techniques & Applications.
CO-04	Study of Gastroretentive formulations.
CO-05	Evaluation Study of Modified Drug Release Systems
CO-06	Study of formulation and processing of therapeutic aerosols
CO-07	Study of Targeted, Nasopulmonary & Transdermal drug delivery system.
CO-08	Study of evaluation of marketed preparations.



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Course Outcome

B. Pharmacy (VIII Semester)

Sub. Code	Subject
BP801T	BIOSTATISTICS AND RESEARCH METHODOLOGY
BP802T	SOCIAL AND PREVENTIVE PHARMACY
BP803T	COSMETICS SCIENCE
BP804T	PHARMACEUTICAL PRODUCT DEVELOPMENT

SUBJECT: BIOSTATISTICS AND RESEARCH METHODOLOGY SUBJECT CODE: BP801T

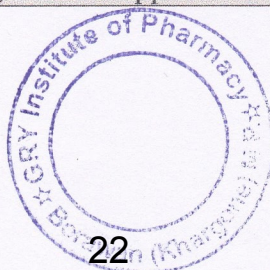
	Course Outcome
CO-01	To understand the applications of Biostatistics in Pharmacy
CO-02	Know the operation of M.S. Excel, SPSS, R and MINITAB® , DoE (Design of Experiment)
CO-03	Know the various statistical techniques to solve statistical problems
CO-04	Appreciate statistical techniques in solving the problems.
CO-05	Hypothesis testing for research


SUBJECT: SOCIAL AND PREVENTIVE PHARMACY SUBJECT CODE: BP802T

	Course Outcome
CO-01	Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide.
CO-02	Have a critical way of thinking based on current healthcare development.
CO-03	Evaluate alternative ways of solving problems related to health and pharmaceutical issues.
CO-04	To understand different preventive medicines and national health programs.

SUBJECT: PHARMACEUTICAL PRODUCT DEVELOPMENT SUBJECT CODE: BP804T

	Course Outcome
CO-01	To study regulations related to preformulation, formulation development, stability assessment
CO-02	Knowledge about quality control testing of different types of dosage forms
CO-03	An advanced study of Pharmaceutical Excipients in pharmaceutical product development
CO-04	Advanced study of Pharmaceutical Excipients used in different dosage forms in pharmaceutical product development
CO-05	Study of various optimization techniques for pharmaceutical product development
CO-06	Knowledge about Selection and quality control testing of packaging materials for pharmaceutical product development
CO-07	Study of Quality by Design and its application in pharmaceutical product development.

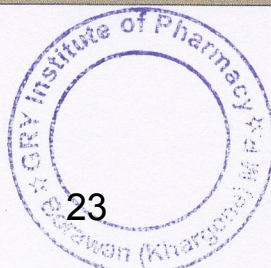




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Program Outcome (POs)

PO-01	Pharmaceutical Knowledge:- Students gain a deep knowledge regarding human body, its related diseases, analytical skills, drug molecules (Active Pharmaceutical Ingredients) along with excipients, natural drug resources, chemistry involved in API including synthesis of commonly used drugs, effect of drug on human body, toxicity and impurity profile, ADME studies of drugs (behavior of drug in human body), dosage form studies including novel approaches, designing and development of formulation stability studies, analysis etc i.e. overall knowledge and comprehension of the core and basic knowledge associated with the pharmacy profession.
PO-02	Problem Analysis: Students could apply the knowledge in research field to make new discoveries. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
PO-03	Design & Development of dosage forms: Various dosage forms could be prepared by the pharmacy students in the pharmaceutical companies for the ease of patients.
PO-04	Modern methods usage: Create, select, and apply appropriate techniques, resources, and modern methods with an understanding of the limitations and its usage. The student also learns to handle many instruments related to their studies which would help them work in a Pharmaceutical Industry, pharmacovigilance, regulatory requirements, legal processes etc.
PO-05	Pharmacy and society: As Pharmacist provides complete health care data and practices to the people of the society and guides them to be healthy. The program learns about the drug distribution system, patient counseling, industrial laws etc. and gains expertise in storage and distribution of drugs with all precautions and in-depth knowledge of dose, adverse effect and other health related issues to deal with indoor and outdoor patients admitted in hospitals and also in public.
PO-06	Environment and sustainability: Understand the impact of the professional pharmacist in society and environment, and make an impact of it on the people of the society.
PO-07	Pharmaceutical Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the pharmacy practice. Student is also trained in ethical behavior with physician, nurses and other paramedical staff for protecting patient's health.
PO-08	Leadership skill: Function effectively as an individual, understand and consider the changes around as a leader and team builder for the fulfillment of practice, professional and social responsibilities.
PO-09	Communication: Communicate effectively on pharmaceutical activities with the community and with society.
PO-10	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.
PO-11	Social Interaction: Being a public welfare job a pharmacist would be able to interact with the people in a better way to cure them and make them feel healthy.
PO-12	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.




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