RAJ KUMAR GOEL INSTITUTE OF TECHNOLOGY (PHARMACY), GHAZIABAD

B. PHARM 1ST SEMESTER COURSE OUTCOMES, 2024-2025

COURSE	COURSE CODE	COURSE OUTCOMES
Human Anatomy and Physiology	**BP101T**	Upon completion of the course, the students will be able to – 1. Demonstrate various anatomical positions and explain the levels of organization of human body and illustrate the contributions of organ systems to the maintenance of homeostasis with the use of feedback system. 2. Discuss in depth the components & physiology of musculoskeletal system. 3. Discuss the body fluid of human body like lymph & blood. 4. List the components and functions of peripheral nervous system and sense organs. 5. Recognize the major organs and blood vessels of the cardiovascular system and understand their functions.
Pharmaceutical Analysis I	**BP102T**	Upon completion of the course, the students will be able to – 1. Illustrate the scope and applications of techniques of pharmaceutical analysis, pharmacopoeia, limit tests and the methods for expressing concentrations and describe the sources, types and methods for minimizing errors. 2. Explain the theories and principles related to acid base, non-aqueous, precipitation, complexometric, gravimetric, diazotization titrations. 3. Classify and describe the redox and electrochemical methods of analysis. 4. Formulate, calculate, prepare and standardize various molar and normal solutions
Pharmaceutics I	**BP103T**	Upon completion of the course, the students will be able to – 1.Describe historical aspects and prospects of Pharmacy profession and Pharmacopoeias. 2.Compute the doses of drugs and solve problems related to percentage solutions, alcohol dilutions, proof spirits and isotonicity adjustments. 3.Recognize various parts of prescriptions; describe procedure for compounding and dispensing of a typical prescription and; explain various types of incompatibilities involved along with their remedial actions. 4.Classify various pharmaceutical dosage forms and; define them. 5.Explain the advantages, limitations, classification, formulation and evaluation of Powders, monophasic liquids, suspensions, emulsions, suppositories and semi-solid dosage forms

Pharmaceutical Inorganic Chemistry	**BP104T**	Upon completion of the course, the students will be able to – 1.Explain Principle involved in Limit test for detecting Impurities present in pharmaceuticals. 2. Apply the concepts of buffers, methods of measurement and adjustment of isotonicity. 3. Explain major extra and intracellular electrolytes and physiological acid base balance. 4. Discuss various inorganic and pharmaceutical compounds belonging to various categories with special reference method of preparation, properties, assay and uses. 5. Illustrate the concept of radioactivity along with storage conditions, precautions and pharmaceutical importance of radioactive substances.
Communication Skills	**BP105T**	Upon completion of the course, the students will be able to – 1.Understand the basic objective of the course by being acquainted with specific dimensions of Communication skills i.e. Reading, Writing, Listening, Thinking and Speaking 2.Apply it for practical and oral presentation purposes by being honed up in presentation skills and voice-dynamics. They will apply techniques for developing inter-personal communication skills and positive attitude leading to their professional competence 3.Apply it at their work place for writing purposes such as presentation/official Drafting/administrative communication and use it for document /project /report. 4. Recognize learning aspects of communication for better performance in recruitment process and prospective jobs. 5. Assess, comprehend , converse, interact and participate at multinational levels in day-to –day events and situation
Remedial Biology	**BP106RBT**	Upon completion of the course, the students will be able to – 1.Classify living systems including their nature, organization and evolution. 2. Explain the structure and functions of cells, tissues and describe processes by which cells replicate and generalize how organisms obtain and use matter and energy to live and grow. 3. Describe how different organ systems carry out specific functions in multicellular organisms.
Remedial Maths	**BP106RMT**	Upon completion of the course, the students will be able to – 1. Understand Partial fraction, Logarithm, function and Limits and continuity with their application in Pharmacy. 2. Analyze Matrices and Determinant with Application of Matrices in solving Pharmacokinetic equations. 3. Solve different equations of Differentiation. 4. Solve problems of Analytical Geometry and Integration with their application in Pharmacy. 5. Understand and analyze Differential Equations , Laplace Transform with their Application in solving Pharmacokinetic equations

RAJ KUMAR GOEL INSTITUTE OF TECHNOLOGY (PHARMACY), GHAZIABAD

B. PHARM 1ST SEMESTER COURSE OUTCOMES, 2024-2025

COURSE	COURSE CODE	COURSE OUTCOMES
Human Anatomy and Physiology	**BP107P**	Upon completion of the course, the students will be able to – 1.Demonstrate the working of compound microscope & identify the different types of bones & other tissues using microscope. 2.Estimate hematological parameters like hemoglobin, RBCs count, WBCs count, bleeding time & clotting times etc. 3.Record blood pressure, pulse rate.
Pharmaceutical Analysis I	**BP108P**	Upon completion of the course, the students will be able to – 1. Study various glassware and electronic balance, calibrate various volumetric glassware, and demonstrate the electrochemical methods of analysis. 2. Prepare and standardize solutions of 0.1N Hydrochloric acid, 0.1N Sulphuric acid, 0.1N Sodium hydroxide, 0.05 M Disodium Edetate, 0.1N Potassium permanganate and 0.05 M Iodine solution. 3. Perform and report the Assay of Ferrous sulphate, Sodium bicarbonate and Sodium chloride through various techniques.
Pharmaceutics I	**BP109P**	Upon completion of the course, the students will be able to – 1.Refer and retrieve information from official books. 2.Use various glassware, weighing and measuring operations used in compounding and dispensing of a variety of dosage forms. 3.Define, differentiate and formulate various dosage forms listed in official compendia. 4.Explain the roles and examples of various additives used in dosage forms. 5.Label the compounded formulation as per legal and patient requirements.
Pharmaceutical Inorganic Chemistry	**BP110P**	Upon completion of the course, the students will be able to – 1. Examine the impurity level by using limit test for various colored and insoluble inorganic compounds. 2. Identify qualitatively the various inorganic ions. 3. Prepare the inorganic compounds by simple chemical reaction. 4. Analyze test for purity with respect to various parameters of inorganic compounds
Communication Skills	**BP111P**	Upon completion of the course, the students will be able to – 1. Perform better in their academic and professional scenario such as economic, environmental, social, political and ethical scenario 2. Utilize phonetic dictionary symbols to continue to improve pronunciation 3. Recognize, explain, and use the formal elements of specific genres of organizational communication: white papers, 4. recommend and analyze reports, proposals, memorandums, web pages, wikis, blogs, business letters, and promotional documents.

		5.Understand professional writing by studying management communication contexts and genres, researching contemporary business topics
Remedial Biology	**BP112RBP**	Upon completion of the course, the students will be able to – 1. Demonstrate various section cutting techniques and procedure for preparation of permanent slide. 2. Describe different parts of a plant, their modifications and identification of various plant tissues. 3. Determine blood groups, blood pressure and tidal Volume. 4. Recognize various cell inclusions, bones and parts of frog using computer models

RAJ KUMAR GOEL INSTITUTE OF TECHNOLOGY (PHARMACY), GHAZIABAD

B. PHARM 2ND SEMESTER COURSE OUTCOMES, 2024-2025

COURSE	COURSE CODE	COURSE OUTCOMES
Human Anatomy and Physiology I	**BP201T**	Upon completion of the course, the students will be able to – 1. Classify nerve fibers, list the events that generate action potential and describe structure and functions of central nervous system. 2. Illustrate anatomy and physiology of organs of the digestive system and understand the process of digestion in regulation of energy and metabolism. 3. Explain gross morphology, structure and function of respiratory and urinary system. Summarize role of these systems in acid-base homeostasis. 4. Classify hormones, outline the mechanism of hormones action and describe the location, functions and disorders of different endocrine glands. 5. Describe anatomy and physiology of male and female reproductive systems and understand the basic principles of gene.
Pharmaceutical Organic Chemistry I	**BP202T**	Upon completion of the course, the students will be able to – 1. Explain IUPAC rules of nomenclature to give correct names for organic compounds and structural isomerism in organic compounds having up to 10 Carbons open chain structures with functional groups. 2. Discuss the synthesis of organic compounds belonging the category of Alkanes, Alkenes, Conjugated Dienes, Alkyl halides, Alcohols, carbonyl compounds, carboxylic acids and aliphatic amines by their general methods of preparation. 3. Describe elimination (E1&E2), electrophilic addition, free radical substitution and addition, nucleophilic substitution (SN1 &SN2), nucleophilic addition reactions, orientation of reactions and various name reactions with their mechanisms. 4. 4. Apply knowledge of hybridization, rearrangement of carbocations, stabilities of alkenes and conjugated dienes, order of reactivity of alkyl halides, electromeric effect, acidity of carboxylic acids and basicity of aliphatic amines in problem solving of organic chemistry. 5. Identify the organic compounds by their qualitative tests and memorize the structure and uses of organic compounds of paraffins, alkyl halides, alcohols, carbonyl compounds, carboxylic acids and aliphatic amines.
Biochemistry	**BP203T**	Upon completion of the course, the students will be able to – 1. Describe the principles and mechanisms of biological oxidation, energetics and regulation of enzymes and isoenzymes with their application in biological processes. 2. Explain the biological pathways and processes of carbohydrates, lipids, amino acids and nucleic acid. 3. Identify the structure and functions of Nucleotides, DNA, RNA and

		explain the diseases related to mutations.

Pathophysiology	**BP204T**	Upon completion of the course, the students will be able to – 1. Explain basic principles, causes, pathogenesis, and morphology of cell injury & categorize various adaptation mechanism of cell. 2. Outline & explain the basic mechanism involved in the inflammation & repair. 3. Describe the etiology, sign & symptoms, & pathophysiology of various diseases.
Computer Applications in Pharmacy	**BP205T**	Upon completion of the course, the students will be able to – 1. Student know the introduction of Number system, Concept of Information Systems and Software. 2. Student know the introduction of Web technologies with Introduction to databases, MYSQL, MS ACCESS, Pharmacy Drug database. 3. Student know the introduction of Application of computers in Pharmacy. 4. Student know the introduction of Bioinformatics, Impact of Bioinformatics in Vaccine Discovery. 5. Student know the introduction of Computers as data analysis in Preclinical development.
Environmental Sciences	**BP206T**	Upon completion of the course, the students will be able to – 1. Demonstrate a general understanding of the scope and interdisciplinary nature of environmental issues. 2. Understand complex relationships between natural and human systems. 3. Understand ecosystems in context of coupled human environmental interactions. 4. Understand the different types of environmental pollution

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B. PHARM 2ND SEMESTER COURSE OUTCOMES, 2024-2025

COURSE	COURSE CODE	COURSE OUTCOMES
Human Anatomy and Physiology II- Practical	**BP207P**	Upon completion of the course, the students will be able to – 1. Identify various body system and family planning devices with the help of charts & models. 2. Record body mass index, body temperature, lungs volume & capacity & blood count. 3. Demonstrate the various activities like visual acuity, reflex activity and general neurological examination.
Pharmaceutical Organic Chemistry I- Practical	**BP208P**	Upon completion of the course, the students will be able to – 1. Identify the unknown organic compounds by preliminary test (colour, odour, aliphatic/aromatic nature, saturation and unsaturation), solubility tests and element detection by Lassigne's Test. 2. Analyze functional groups (Phenols, Carboxilic Acids, Carbohydrates, Aldehydes / Ketones, Nitro Compounds, Amines, Amides, Alcohol) by performing various qualitative tests. 3. Determine the melting and boiling point of given compound and confirm the synthesized derivatives by melting / boiling point methods. 4. Prepare some organic compounds derivatives. 5. Construct a molecular model of some organic compounds using molecular model Kit.
Biochemistry- Practical	**BP209P**	Upon completion of the course, the students will be able to - 1. Separate the biological samples like lipids and amino acids by the principle of chromatography. 2. Formulate buffers of various concentrations with desired pH. 3. Categorize the abnormal constituents present in biological samples and factors affecting activity of alpha-amylase.
Computer Applications in Pharmacy- Practical	**BP210P**	Upon completion of the course, the students will be able to – 1. Design a questionnaire using a word processing package to gather information about a particular disease. Retrieve the information of a drug and its adverse effects using online tools Create a HTML web page to show personal information 2. Creating mailing labels Using Label Wizard, generating label in MS WORD. 3. Create a database in MS Access to store the patient information with the required fields using access. Design a form in MS Access to view, add, delete and modify the patient record in the database. 4. Generating report and printing the report from patient database, creating invoice table Drug information storage and retrieval using MS Access. 5. Exporting Tables, Queries, forms, XML pages, and reports to web pages.

RAJ KUMAR GOEL INSTITUTE OF TECHNOLOGY (PHARMACY), GHAZIABAD

B. PHARM 3RD SEMESTER COURSE OUTCOMES, 2024-2025

COURSE	COURSE CODE	COURSE OUTCOMES
Pharmaceutical Organic Chemistry II	**BP301T**	Upon completion of the course, the students will be able to – 1. Explain different findings/theories for the structural stability of Benzene and Cycloalkanes. 2. Describe the preparation and reactions of the organic compounds belonging to benzene, phenols, aromatic amines, aromatic acids, polynuclear hydrocarbons, cycloalkanes and fatty acids. 3. Illustrate the application of substituents effect on orientation and reactivity of benzene, acidity of phenols, aromatic acids and basicity of aromatic amines. 4. Determine the value and significance of analytical constants of fats and oils such as Acid, Saponification, Ester, Iodine, Acetyl and Reichert Meissl (RM) value. 5. Identify the structure, name and uses of different organic compounds.
Physical Pharmaceutics I	**BP302T**	Upon completion of the course, the students will be able to – 1. Describe the problems related to solubility of drugs and can analyze that using the modern tools. 2. Demonstrate the different properties of matter, state of matter and can solve the problems related to various physicochemical properties of drug molecules in designing of different dosage forms. 3. Analyze and evaluate the information associated with surface and interfacial phenomenon. 4. Explain the principles of complexation and protein binding and solve the problems related to drug stability. 5. Illustrate the effect of different pH, buffer and isotonic solution in pharmaceutical and biological system.

Pharmaceutical Microbiology	**BP303T**	Upon completion of the course, the students will be able to – 1. Outline the history, scope and applications of Microbiology. 2. Illustrate the Morphology, classification, sterilization, methods of reproduction, identification, cultivation of microbes. 3. Classify describe and evaluate the breeds and the equipment for disinfection, antiseptic and sterilization of microbes. 4. Discuss the principles, methodology, identifying sterility testing and microbiological standardization of specific products; describe the designing's and features of aseptic area. 5. Describe the types, sources and facts responsible for microbial spoilage of pharmaceutical products along with their preservation; discuss the procedure types and application of animal cell culture in Pharmacy.
Pharmaceutical Engineering	**BP304T**	Upon completion of the course, the students will be able to – 1. Recognize types of fluid flow, Bernoulli's theorem, Reynolds's number and its significance, energy losses, orifice meter, venture meter, Pitot tube, Rotometer and classify manometers. 2.Distinguish the concept of size reduction and size separation, centrifugation their objectives, applications and define principle, construction, working, uses, advantages, disadvantages of different industrial equipments. 3.Describe objectives, applications, principle, construction, working, uses, merits, demerits of industrial evaporators, distillation system and heat exchanger, also discuss different modes of heat transfer, related law's and factors effecting evaporation. 4.Explain the perception of mixing and drying with moisture, rate of drying and drying calculations, classification of dryers and mixing equipments and their utilization in pharmaceutical industries. 5.Outline the concepts of filtration, factors influencing, filter aids and medias, and study different types of filters used in manufacturing plants. 6.Differentiate between the Metal-Non metal Material of construction with their composition, corrosion theories and types, preventive methods and applications in pharmaceutical industries and study the applications and techniques of material handling in pharmaceutical industries

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B. PHARM 3RD SEMESTER COURSE OUTCOMES, 2024-2025

COURSE	COURSE CODE	COURSE OUTCOMES
Pharmaceutical Organic Chemistry II	**BP305P**	Upon completion of the course, the students will be able to – 1. Perform experiments involving laboratory techniques (Recrystallization and Steam distillation). 2. Determine different oil values like Acid value, Saponification value and Iodine value. 3. Prepare organic compounds by acylation, halogenation (Bromination), nitration, oxidation, hydrolysis, diazotization, Claison Schmidt and Perkin reaction.
Physical Pharmaceutics I	**BP306P**	Upon completion of the course, the students will be able to – 1. Determine the solubility, partition co-efficient and pKa of drugs, and can solve that using the basic concept, practical approach and modern tools. 2. Determine the HLB and critical micellar concentration in development of different dosage form. 3. Analyze and evaluate the surface tension of any liquid.
Pharmaceutical Microbiology	**BP307P**	Upon completion of the course, the students will be able to – 1. identify glassware, equipments and instruments used in various experiments of microbiology. 2. Prepare various types of culture media for identification, isolation and sub-culturing of microbes. 3. Perform sterilization, evaluation of disinfectants/antibiotics and staining techniques for identification and differentiation of microorganisms.

Pharmaceutical Engineering	**BP308P**	Upon completion of the course, the students will be able to – 1. Explain construction, working & application of various equipment used for pharmaceutical experiments such as Ball Mill, Fluid Energy mill. Hammer Mill., Sieve shaker, Tray dryer, Double cone blender, Planetary mixer, Ribbon blender, Freeze dryer. 2. Evaluate different factors affecting rate of filtration & evaporation and analyze size distribution by sieve shaker 3. Estimate efficiency of steam distillation, define factors affecting rate of drying such as surface area, concentration & temperature & calculate % drying rate, % loss on drying & perform stability twisting using centrifuge. 4. Assess different equipment their working & application of such as tablet punching machine, Sealing machine & Reynold's apparatus.

RAJ KUMAR GOEL INSTITUTE OF TECHNOLOGY (PHARMACY), GHAZIABAD

B. PHARM 4TH SEMESTER COURSE OUTCOMES, 2024-2025

COURSE	COURSE CODE	COURSE OUTCOMES
Pharmaceutical Organic Chemistry III Theory	**BP401T**	Upon completion of the course, the students will be able to – 1. Describe the stereo chemical aspects of organic compounds in terms of Optical isomerism, Geometrical isomerism and Conformational isomerism. 2. Write the nomenclature of DL system, RS system, Cis-Trans, E-Z and Syn-Anti systems along with nomenclature and classification of heterocyclic compounds. 3. Understand the methods of preparation, reactions and properties of heterocyclic compounds. 4. Memorize the medicinal uses and other applications of heterocyclic compounds. 5. Explain name reactions of synthetic importance with their mechanisms.
Medicinal Chemistry I Theory	**BP402T**	Upon completion of the course, the students will be able to – 1. Explain basic pharmacophore and structure of medicinal agents. 2. Describe the concept of physicochemical aspects of drug. 3. Explain stereochemistry, bioisosters, concept of prodrugs, drug metabolism. 4. Discuss concept about classification, synthesis and mechanism of action of various class of drugs e.g. Acetylcholine, benzocain etc. 5. Describe structure activity relationship of various classes of medicinal agents.
Physical Pharmaceutics II – Theory	**BP403T**	Upon completion of the course, the students will be able to – 1. Classify and compare various Colloidal Dispersions and describe their optical, kinetic and colloidal properties. 2. Describe and distinguish Newtonian and non Newtonian systems and explain the concepts of Thixotropy, viscosity with their measurement. 3. Describe the types, formulation procedure and stability problems associated with Coarse Dispersions. 4. Explain and apply the concepts of Micromeritics and powder rheology in order to identify and thereafter choose correct powder sample for the formulation of solid dosage forms. 5. Describe various degradative pathways, means of stabilization of medicinal agents and the guidelines regarding Accelerated stability testing and expiration dating.

Pharmacology I – Theory	**BP404T**	Upon completion of the course, the students will be able to – 1. Explain the basic principles of pharmacology, sources of drugs, essential drugs, routes of drug administration, phases of drug discovery & clinical trial. 2. Understand the principles of absorption, distribution, metabolism, excretion and factors affecting pharmacokinetics of drug. 3. Demonstrate the molecular and biochemical aspects of drug action, receptors, drug interaction, and adverse drug reaction and factors that modify drug effect. 4. Classify and explain the pharmacology of drugs acting on autonomic nervous system. 5. Explain the pharmacological basis of drugs acting on central nervous system.
Pharmacognosy I – Theory	**BP405T**	Upon completion of the course, the students will be able to – 1. Memorize the sources and classification of drugs and know various quality control methods of drugs of natural origin. 2. Describe the techniques adopted for cultivation, collection, processing, storage and conservation of medicinal plant. 3. Explain various types of plant tissue culture, their maintenance and application in Pharmacognosy. 4. Express the role of Pharmacognosy in various systems of medicine. 5. Outline the detail introduction of primary and secondary metabolites along with plant products.

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B. PHARM 4TH SEMESTER COURSE OUTCOMES, 2024-2025

COURSE	COURSE CODE	COURSE OUTCOMES
Medicinal Chemistry I – Practical	**BP406P**	Upon completion of the course, the students will be able to – 1. Synthesize selected medicinal agents by one or multiple steps in laboratory. 2. Perform the assay of selected medicinal agents in laboratory. 3. Determine partition coefficient of selected drugs.
Physical Pharmaceutics II – Practical	**BP407P**	Upon completion of the course, the students will be able to – 1. Determine particle size distribution for powders using different methods 2. Determine derived properties of powders like density, porosity, compressibility and angle of repose. 3. Determine Sedimentation volume for a variety of Suspensions. 4. Determine Viscosity for Newtonian and Non Newtonian Fluids. 5. Apply the concepts of Chemical Kinetics on Drug product stablity.
Pharmacology I – Practical	**BP408P**	Upon completion of the course, the students will be able to - 1. Understand the general principles of experimental pharmacology. 2. Perform Screening of drugs on animals by simulated experiments. 3.Work cooperatively in a small group setting, consider ethical issues while using animals and demonstrate the drug profile of clinically important drugs.
Pharmacognosy I – Practical	**BP409P**	Upon completion of the course, the students will be able to - 1. Analyze the crude drugs by performing chemical tests for them. 2. Differentiate various powdered crude drugs by determining the size of their microscopic characters like calcium oxalate crystals, starch grain, length of fibers by using eye piece micrometer. 3. 4. Determine stomatal number, index of crude drugs by using camera Lucida and evaluate the physical, morphological standards for crude drugs like extractive values, ash values, moisture content, swelling index and foaming index.

RAJ KUMAR GOEL INSTITUTE OF TECHNOLOGY (PHARMACY), GHAZIABAD

B. PHARM 5TH SEMESTER COURSE OUTCOMES, 2024-2025

COURSE	COURSE CODE	COURSE OUTCOMES
Medicinal Chemistry II – Theory	**BP501T**	Upon completion of the course, the students will be able to – 1. Explain the classification, mode of action and uses of various categories of drugs like antihistaminic drugs, antineoplastic agents. 2. Outline the synthesis of selected drugs of different categories, insulin and its preparations. 3. Illustrate the structure activity relationship of various classes of medicinal agents, nomenclature and stereochemistry of steroids.
Industrial Pharmacy I– Theory	**BP502T**	Upon completion of the course, the student will be able to – 1. Explain the different preformulation characteristics (physicochemical characteristics) and apply these applications in the formulations. 2. Explain formulation and evaluation of various pharmaceutical dosage forms and cosmetic preparations. 3. Explain formulation and evaluation of parenteral and ophthalmic preparations. 4. Discuss the evaluation parameters of various dosage forms along with pharmacopoeia limits for variety of parameters. 5. Describe the materials used, factors influencing and legal/official requirements, stability and evaluation of containers & closures (packaging materials) used in pharmaceutical products
Pharmacology II – Theory	**BP503T**	Upon completion of the course, the students will be able to – 1. Illustrate the cardiac electrophysiology: Categorize and demonstrate the pharmacology of drugs acting on cardiovascular system. 2. Classify and explain the pharmacological action of drugs acting on urinary system. 3. Classify autocoids and outline key events involved in inflammation and demonstrate knowledge of basic pharmacology of drugs used in inflammatory disorders. 4. Outline synthesis, release, regulation and pharmacological action of hormones and indicate clinical uses of drugs in various endocrine diseases. 5. Explain various methods of bioassay and their application.

Pharmacognosy and Phytochemistry	**BP504T**	Upon completion of the course, the students will be able to – 1. Explain various metabolic pathways leading to production of secondary metabolites and application of tracer technique to biogenetic studies. 2. Distinguish between various secondary metabolite containing crude drugs by their complete pharmacognostic study. 3. Describe the isolation, identification and analysis of important phytoconstituents. CO.4. Outline production, estimation and utilization of various phytoconstituents. CO.5. Identify modern extraction methods and characterization techniques including chromatography and electrophoresis
Pharmaceutical Jurisprudence – Theory	**BP505T**	After completion of course, the students will able to 1. Detailed study of drug and cosmetic act and rule including schedules, import, manufacturing, sale, labeling, packaging, and administration. 2. Explain the provision, rules, offenses, and penalties of the pharmacy act 1948. 3. Describe the various provision, rules, offenses, and penalties contained in the medicinal and toilet preparation act 1955, narcotic and psychotropic substance act 1985, drug and magic remedies act, medicinal termination of pregnancy act 1970, and intellectual property rights 4. Outline the provision of the cruelty animal act and Drug price control order. 5. Describe the scope and objectives of pharmaceutical legislation, code of pharmaceutical ethics, and right to information act.

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B. PHARM 5TH SEMESTER COURSE OUTCOMES, 2024-2025

COURSE	COURSE CODE	COURSE OUTCOMES
Industrial Pharmacy–I	**BP506 P**	Upon completion of the course, the student will be able to – 1. Formulate and evaluate various solid dosage forms like tablets and capsules. 2. Demonstrate the knowledge of equipment used in industrial pharmacy practical. 3. Interpret and analyze the quality control parameters of pharmaceutical products.
Pharmacology II	**BP507P**	Upon completion of the course, the student will be able to – 1. To remember and learn basic as well as advanced equipment used in experimental pharmacology. 2. Analyze the drug concentrations by various bioassay methods using animal simulator software (Ex-Pharm Software). 3. To predict the effect of agonist and antagonist on dose response curve (Ex-Pharm Software).
Pharmacognosy and Phytochemistry II	**BP508P**	Upon completion of the course, the students will be able to – 1. Prepare slides for studying microscopic characters (histology and powder) of given crude drugs including complete extraction and identification of their chemical constituents. 2. Separate the active principles of given phytoconstituents and compare their isolation procedures including their detection by various methods such as TLC, Chemical test, UV detection etc. 3. Apply their knowledge of chromatographic isolation methods separate the sugar by paper chromatography.
Report on Hospital Training-I	**BP509P**	Explain the organization, functions, and workflow of hospital pharmacy services, including medication procurement, storage, dispensing, and inventory management. 2. Demonstrate knowledge of hospital pharmacy practices, including prescription handling, patient medication records, drug distribution systems, sterile product preparation, and patient counseling under professional supervision. 3. Apply pharmaceutical knowledge to interpret prescriptions, identify medication-related issues, and understand the role of pharmacists in promoting rational drug use and patient safety. 4. Analyze observations made during hospital training and document them systematically in the form of a comprehensive Hospital Training Report following professional and ethical standards.

RAJ KUMAR GOEL INSTITUTE OF TECHNOLOGY (PHARMACY), GHAZIABAD

B. PHARM 6TH SEMESTER COURSE OUTCOMES 2024-2025

COURSE	COURSE CODE	COURSE OUTCOMES
Medicinal Chemistry III Theory	**BP601T**	Upon completion of the course, the students will be able to – 1. Describe the historical background, stereochemistry, chemical degradation and classification of drugs belongs to different categories. 2. Draw the structure and write IUPAC nomenclature of different categories of drugs. 3. Outline synthesis, mechanism of action, SAR and uses of drugs mentioned in syllabus. 4. Explain various approaches, Prodrug approaches and Physicochemical parameters used in QSAR, Pharmacophore modelling and Docking techniques used in drug design
Pharmacology III Theory	**BP 602T**	Upon completion of the course, the students will be able to – 1. Categorize and explain the pharmacology of drugs acting on the respiratory and digestive system. 2. Classify antimicrobial agents and explain the pharmacology of drugs effective in various infectious diseases. 3. Describe the pharmacology of cancer chemotherapy and immunomodulators. 4. Explain the general principles, types of toxicity and treatment of poisoning: describe the significance of chronotherapy
Herbal Drug Technology Theory	**BP 603T**	Upon completion of the course, the students will be able to – 1. Identify source of herbs, describe processing, collection, cultivation and pest management of herbals of as per GACP. 2. Use various pharmacopoeias and discuss preparation, evaluation parameters, excipients for herbal and ayurvedic formulations and cosmetics. 3. Define, classify nutraceuticals, drugs and food interactions of herbal origin with examples and discuss their importance in commercial and health perspective. 4. Summarize the scope, future prospects and Schedule T applicable to plant-based industry in India. 5. Discuss on methods to asses herbal quality and stability as per who and ich guidelines and overview on regulations pertaining herbal IPR, s.

Biopharmaceutics and Pharmacokinetics Theory	**BP 604T**	Upon completion of the course, the students will be able to – 1. Understand the biopharmaceutical features and mechanisms of GIT absorption and distribution, factors affecting GIT drug absorption; Kinetics of drug protein binding. 2. Discuss metabolic pathways, renal excretion, clearance; Bioavailability of in-vitro-in-vivo correlations and methods of bioequivalence. 3. Understand kinetics and compartment, non-compartment, physiological models and kinetic parameters. 4. Demonstrate the multi compartment models, multiple dosing, drug levels and dose calculations. 5. Analyse the significance of nonlinear pharmacokinetics, Michaelis Menten method of parameter estimation with suitable examples.
Pharmaceutical Biotechnology Theory	**BP 605T**	Upon completion of the course, the students will be able to – 1. Explain basic concepts, techniques and applications of immobilization of enzymes in Pharmaceutical Industries and Principles of Genetic and protein engineering. 2. Illustrate genetic and recombinant DNA technology and microbial transformation in industrial biotechnology for the production of Insulin, Interferon, hepatitis- B. 3. Describe principles of immunology as applied to drug development with emphasis on immunotherapeutic agents. 4. Recall the techniques of immunoassay and types of mutation. 5. Outline construction, type, working of fermenter and recovery of antibiotics and blood products from it.
Quality Assurance Theory	**BP 606T**	Upon completion of the course, the students will be able to – 1. Applying the Quality Assurance, TQM, ICH guidelines, QbD, ISO and NABL related principles and procedures in pharmaceutical industries for improving the quality. 2. Understand the different cGMP aspects like Organization and Personnel, Premises, Equipment and Raw materials related to pharmaceutical industries. 3. Applying the Quality Control test and GLP concepts to decision making in pharmaceutical industries. 4. Prepare the different forms and documents related to pharmaceutical industries like; SOP, Batch Formula Record, Master Formula Record, documents related to complaint, Quality audit, Quality Review and Quality documentation, Distribution records, etc. 5. Understand the scope of Calibration, Validation and material management applicable to pharmaceutical industries.
Medicinal Chemistry III Practical	**BP 607P**	Upon completion of the course, the students will be able to – 1. To synthesize drugs and intermediates by conventional method and microwave irradiation technique. 2. To analyze the purity of medicinal compounds. 3. To draw the chemical structures and reactions using chemdraw. 4. To estimate the physicochemical properties of drug using drug design software.

Pharmacology III Practical	**BP 608P**	Upon completion of the course, the students will be able to – 1. Calculate the dose of drugs for a laboratory animal. 2. Perform toxicity studies following standard guidelines. 3. Perform screening of various drugs using simulated experiment or videos. 4. Apply various statistical tools in experimental pharmacology.
Herbal Drug Technology Practical	**BP 609P**	Upon completion of the course, the students will be able to – 1. Perform phytochemical screening. 2. Use and evaluate natural excipients. 3. Prepare cosmetics, herbal and traditional formulations. 4. Standardize cosmetics and herbals from natural origin using pharmacopoeias. 5. Use various Pharmacopoeias to analyze monographs of crude drugs and formulations.
Report on Industrial Training	**BP610P**	Upon completion of the course, the students will be able to – 1. Describe the organizational structure, workflow, and various functional departments of a pharmaceutical industry, including production, quality assurance, quality control, packaging, and regulatory affairs. 2. Demonstrate an understanding of Good Manufacturing Practices (GMP), Good Documentation Practices (GDP), safety regulations, and quality systems followed in pharmaceutical industries. 3. Apply theoretical knowledge gained during the B.Pharm program to understand pharmaceutical manufacturing processes, quality control procedures, equipment operation, and industrial documentation. 4. Analyze industrial practices, identify challenges encountered during training, and prepare a comprehensive Industrial Training Report based on observations and learning outcomes. 5. Demonstrate professional ethics, communication skills, teamwork, and technical presentation skills through report writing and viva voce, integrating industrial exposure with academic learning.

RAJ KUMAR GOEL INSTITUTE OF TECHNOLOGY (PHARMACY), GHAZIABAD

B. PHARM 7TH SEMESTER COURSE OUTCOMES 2024-2025

COURSE	COURSE CODE	COURSE OUTCOMES
Instrumental Methods of Analysis	**BP 701T**	Upon completion of the course, the students will be able to – 1. Discuss the instrumentation and applications of the major techniques of instrumental drug analysis. 2. Analyze the structures of new compounds by spectroscopic techniques. 3. Describe fundamentals of methodology, instrumentation and applications of different chromatographic techniques.
Industrial Pharmacy II	**BP 702T**	Upon completion of the course, the students will be able to – 1. Describe the General considerations and Product considerations for the Pilot Plant Scale up techniques for Solid, Liquid and semisolid dosage forms. 2. Explain the guidelines, processes and documentations involves in the Technology Transfer of drug products. 3. Describe the regulatory requirements for drug approval including IND, NDA applications and clinical research. 4. Explain the Quality management systems adopted like TQM, QbD, six sigma and ISO. 5. Appraise about the Indian regulatory bodies and requirements for regulatory clearances of drug products.
Pharmacy Practice	**BP 703T**	Upon completion of the course, the students will be able to – 1. Describe the functions, organization and Management of hospital pharmacy: Describe the role and function of hospital pharmacist in drug dispensing, PTC, Formulary, describe drug. 2. Explain drug store management and inventory control along with role of pharmacist in drug distribution of controlled and OTC drugs to various category of patients. 3. illustrate the establishment and management of wholesale and retail drug store and the ethical functions of community pharmacist in patient counselling, promoting rationale use of drugs. 4. Explain the scope of clinical pharmacy with various functions of clinical pharmacist including monitoring of drug therapy through medication chart review: interpretation of selected clinical reports. 5. Classify various ADRs and drug interaction along with method of detection and their reporting and management.
NDDS- Theory	**BP 704T**	Upon completion of the course, the students will be able to – 1. Explain the basic concepts/principles & physicochemical & biological properties of drugs related to novel drug delivery systems. 2. Describe various approaches for development of novel drug delivery systems. 3. Discuss the criteria for selection of drugs and polymers for development of novel drug delivery systems, their formation & evaluation.
		Upon completion of the course, the students will be able to – 1. Determination of the λmax & assay of different drugs in the given sample

Instrumental Methods of Analysis/NDDS Practical	**BP 705P**	and also the effect of various factors on UV spectrophotometry. 2. Develop the calibration curve of various drugs and dosage forms by verifying Beer-Lambert's law and find out their unknown concentration on UV spectroscopy. 3. Develop the calibration curve of various drugs and dosage forms by verifying Beer-Lambert's law and find out their unknown concentration on UV spectroscopy. 4. Analyze the Rf values of drugs by using different chromatographic techniques & Spectroscopic techniques. 5. Formulate and evaluate various drug delivery systems by different analytical techniques
Practice School	**BP706PS**	1. Demonstrate knowledge of the organizational structure, workflow, and professional practices in the selected pharmacy domain (hospital, community, pharmaceutical industry, clinical research, regulatory affairs, quality control, etc.). 2. Apply pharmaceutical knowledge and technical skills to perform assigned tasks while adhering to Good Pharmacy Practices (GPP), Good Manufacturing Practices (GMP), and relevant regulatory and ethical guidelines. 3. Analyze real-world pharmaceutical problems, identify appropriate solutions, and document observations through systematic record keeping and report writing. 4. Demonstrate effective communication, teamwork, professionalism, leadership, and interpersonal skills while working with healthcare professionals and industry personnel. 5. Prepare and present a comprehensive Practice School report, critically evaluate the learning experience, and integrate theoretical knowledge with practical applications in pharmacy practice.
Report on Hospital/Industrial Training II	**BP707P**	1. Describe the organizational structure, workflow, and functioning of a hospital pharmacy or pharmaceutical industry, including the roles and responsibilities of various departments. 2. Demonstrate understanding of Good Pharmacy Practices (GPP), Good Manufacturing Practices (GMP), Standard Operating Procedures (SOPs), safety measures, quality assurance, and regulatory requirements observed during the training. 3. Apply theoretical knowledge of pharmaceutical sciences to real-life hospital or industrial practices, including dispensing, inventory management, manufacturing, quality control, quality assurance, clinical services, or regulatory affairs, as applicable. 4. Analyze the practical challenges encountered during hospital/industrial training and propose appropriate scientific and professional solutions based on pharmaceutical principles. 5. Prepare and present a comprehensive training report demonstrating professional ethics, technical documentation skills, communication abilities, and critical reflection on the learning outcomes achieved during the training.

RAJ KUMAR GOEL INSTITUTE OF TECHNOLOGY (PHARMACY), GHAZIABAD

B. PHARM 8TH SEMESTER COURSE OUTCOMES 2024-2025

COURSE	COURSE CODE	COURSE OUTCOMES
Biostatistics and Research Methodology	**BP801T**	Upon completion of the course, the students will be able to – 1. Explain the fundamental concepts of biostatistics, including data collection, measures of central tendency and dispersion, probability distributions, sampling techniques, and hypothesis testing. 2. Apply appropriate statistical methods such as correlation, regression, parametric and non-parametric tests, and analysis of variance (ANOVA) to solve pharmaceutical and biomedical research problems. 3. Analyze and interpret pharmaceutical research data using statistical software such as MS Excel, SPSS, R, and MINITAB, and present results accurately. 4. Demonstrate knowledge of research methodology, including study design, clinical trials, observational studies, ethical considerations, protocol preparation, and scientific documentation. 5. Evaluate research findings using statistical evidence and apply biostatistical principles for informed decision-making in pharmaceutical research and healthcare practice.
Social and Preventive Pharmacy	**BP 802T**	Upon completion of the course, the students will be able to – 1. Explain the concept of health and disease in respect to social, cultural and hygiene aspects. Nutritional deficiencies and its prevention. 2. Explain the principles on the prevention and control of communicable and non-communicable diseases. 3. Identify various National health programs, their objectives, functioning and outcomes. 4. Describe various National health intervention programs and role of WHO in these programs. 5. Outline the role of PHC in various health related community services in rural, urban and school settings.
Pharma Marketing Management	**BP 803ET**	Upon completion of the course, the students will be able to – 1. Describe the general and emerging concept in pharmaceutical market like market segmentation, consumer profile, prescribing habits and market research etc. 2. Illustrate the concept of product decision & product management in the pharmaceutical industry. 3. Describe the various methods related to promotion of all categories of pharmaceutical products. 4. Explain the different pharmaceutical marketing channels and the responsibility of a professional sales representative.
Cosmetic Science	**BP 809ET**	Upon completion of the course, the students will be able to – 1. Understand the concept in cosmetic and toilet preparations. 2 Applying the knowledge of cosmetic according to application on the

		different parts of body. 3. Design the manufacturing technique for formulation of various cosmetics and its safety evaluation.
Pharmaceutical Product Development	**BP 813ET**	Upon completion of the course, the students will be able to – 1. Explain the objectives and various regulations related to preformulation, formulation development, stability assessment & quality control of different dosage forms. 2. Enumerate, identify & describe various pharmaceutical excipients in pharmaceutical product of different conventional & NDDS. 3. Discuss the importance, methodology & application of various optimization & QBD in formulation development. 4. Describe various types of packaging materials along with the quality control tests and regulatory requirements.
Project Work (Elective)	**BP814PW**	Upon completion of the course, the students will be able to – 1. Identify a pharmaceutical research problem related to the chosen elective subject through an extensive review of scientific literature and formulate clear research objectives. 2. Design and execute an appropriate experimental plan, survey, computational study, or analytical investigation using suitable research methodologies and ethical practices. 3. Collect, organize, analyze, and interpret experimental or survey data using appropriate statistical and scientific tools to draw valid conclusions. 4. Demonstrate critical thinking and problem-solving skills by evaluating the outcomes of the project and proposing scientifically justified recommendations or future research directions. 5. Prepare a professional project report and effectively communicate the research findings through oral presentation and viva voce while demonstrating teamwork, technical writing, and professional ethics.