



GIET SCHOOL OF PHARMACY

(SPONSORED BY SRI KOUNDINYA EDUCATIONAL SOCIETY)

(Affiliated to Andhra University, Approved by AICTE & PCI)

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PROGRAMME: B.PHARMACY (COURSE OUTCOMES)

Course Name: Human Anatomy and Physiology (Theory);

Course code: 101 T, I. B. Pharmacy, First Semester.

BP101T.1	To understand characteristics of different types of tissues and their location in various organs, transport processes across the cell membrane.
BP101T.2	To elaborate the process of impulse transmission in central and peripheral nervous system and reflex arc.
BP101T.3	To appraise the physiology of heart and regulation of blood pressure.
BP101T.4	To evaluate the process of respiration, gas exchange and role of enzymes involved in digestion.
BP101T.5	To interpret the process of formation of urine and appraise function of various hormones.
BP201T.6	To improve the knowledge on physiology of various sense organs.

Course Name: Human Anatomy and Physiology practical);

Course code: BP107P, I. B. Pharmacy, FIRST Semester.

BP107P.1	To understand the usage of compound microscope.
BP107P.2	To classify various tissues based on their characteristics by observing them under microscope.
BP107P.3	To estimate the physiological conditions of human body by recording heart rate, pulse rate, blood pressure, bleeding and clotting time.
BP107P.4	To determine the RBC and WBC in human blood.
BP10PP.5	To estimate the DLC and ESR of human blood sample.
BP107P.6	To appreciate the working pattern of sense organs in coordination with nervous system.

Course Name: Pharmaceutical Analysis – I (Theory);

Course code: BP102T, I.B.Pharmacy, First and Second Semesters.

BP102T.1	To define and differentiate terminologies in pharmaceutical analysis.
BP102T.2	To classify different types of analytical techniques, errors and limit tests.
BP102T.3	To apply various theoretical concepts and principles involved in limit tests.
BP102T.4	To examine the importance of computation of analytical results, stoichiometric analytical problems and pH of buffers.
BP102T.5	To estimate various pharmaceutical compounds using acid -base, complexometric, non-aqueous, gravimetric techniques, redox, precipitation and diazotization titrations.
BP102T.6	To elaborate the importance of Good laboratory Practices (GLP), gas analysis, moisture and alcohol content.

Course Name: Mathematics [Bridge course] (Theory)

Course code: BP106RMT, I.B.Pharmacy, First and Second Semesters.

BP 106RMT.1	To outline the concepts of mathematics and their application in pharmacy.
BP 106RMT.2	To illustrate different types of problems by applying mathematics.
BP 106RMT.3	To apply both conventional and creative techniques to solve problems in mathematics.
BP 106RMT.4	To correlate the mathematical tools in wide professional views and solve problems of trigonometry, calculus and matrices.
BP 106RMT.5	To measure the range of techniques effectively to solve problems including theory of deduction, approximation and simulation.
BP 106RMT.6	To plan and design problems in mathematics that promote logical thinking.

Course Name: Pharmaceutics – I [General Pharmacy including dispensing] (Theory)

Course code: BP103T, I.B.Pharmacy, First and Second Semesters.

BP103T.1	To classify different dosage forms and know the purpose of additives in the formulation.
BP103T.2	To understand the concepts of formulation, methods of preparation of liquid dosage forms.
BP103T.3	To analyze the problems involved in dispensing of powders and methods to overcome and learn the official formulations.
BP103T.4	To elaborate different types of suppositories, suppository bases, manufacturing methods and uses of suppositories.
P103T.5	To discuss the concepts of weights and measures, inter conversions and pharmaceutical calculations appropriately and pharmacy profession.
BP103T.6	To devise the extraction process and prepare galenicals and to elaborate the concepts of packaging.

Course Name: Biology [Bridge course] (Theory)

Course code: BP106RBT,I.B.Pharmacy, First and Second Semesters.

BP106RBT.1	To understand the cell structure, cellular inclusions and the process of mitosis and meiosis in animals.
BP106RBT.2	To classify plant and animal kingdom and to analyze the structure of bacteria, yeast, amoeba, paramecium and earthworm.
BP106RBT.3	To acquire the knowledge of taxonomic characteristics of plants belong to solanaceae and umbelliferae.
BP106RBT.4	To analyze morphology and functions of various plant parts such as root, stem, leaf, flower, fruit and seed.
BP106RBT.5	To elaborate the methods of pollination and the process of inflorescence.
BP106RBT.6	To identify the structure of various parasites such as entamoeba, plasmodium, trypanosoma and ascaris.

Course Name: Pharmaceutical Analysis – I (Practical);

Course code: BP108P, First and Second Semesters.

BP108P.1	To choose appropriate primary and secondary standards in standardization and calibration methods.
BP108P.2	To determine the different limit tests and titrations.
BP108P.3	To experiment with acid-base, redox, complexometric and limit tests.
BP108P.4	To analyze different limits of impurities using limit tests.
BP108P.5	To explain about GLP and estimate active pharmaceutical ingredient in pharmaceutical dosage forms.
BP108P.6	To establish the importance of significant figures and computation of analytical data.

Course Name: Pharmaceutics – I [General Pharmacy including dispensing] (Practical);

Course code:BP109P, IB.Pharmacy, First and Second Semesters.

BP109P.1	To recall and recognize the concepts related to dosage forms like monophasic and biphasic liquid dosage forms.
BP109P.2	To use the compounding and dispensing methods for liquid orals.
BP109P.3	To apply the knowledge of principles and procedures to prepare emulsions and suspensions.
BP109P.4	To elucidate the compounding of suppositories.
BP109P.5	To prepare and dispense the liquid dosage forms for external applications.
BP109P.6	To discuss the concepts and principles in the compounding and dispensing of liquid dosage forms for instillation.

Course Name: Biology [Bridge course] (Practical)

Course code:BP112RBP, I.B.Pharmacy, First and Second Semesters.

BP112RBP.1	To understand the function and operation of microscope.
BP112RBP.2	To describe the plants belong to angiosperm family.
BP112RBP.3	To perform microscope evaluation of different plant tissues and primary anatomical structure of root, stem and leaf.
BP112RBP.4	To perform microscopic and macroscopic examination and identification of root, stem and leaf.
BP112RBP.5	To dissect earthworm and identify the digestive and nervous systems.
BP112RBP.6	To design and develop herbarium of selected plant species.

Course Name: Computer Applications and Statistical Methods (Theory)

Course code: BP205T, I.B.Pharmacy, First and Second Semesters.

BP205T.1	To relate measures of location, dispersions and to match grouped and ungrouped data cases.
BP205T.2	To understand the fundamentals of BASIC and C languages.
BP205T.3	To illustrate probability, distribution and non parametric tests such as T test, Chi Square test and F test and their significance.
BP205T.4	To compute and interpret, results of bivariate and multivariate regression and correlation analysis.
BP205T.5	To demonstrate the types of characteristics and various components of computers.
BP205T.6	To create the knowledge of various statistical methods and computer knowledge in pharmacy.

Course Name: Pharmaceutical Chemistry – I [Organic – I] (Theory)

Course code: BP202T, I.B.Pharmacy, First and Second Semesters.

BP202T.1	To recall basic principles of atomic structure, electronic configuration, reactive intermediates and electron displacement effects.
BP202T.2	To apply the knowledge of reactive intermediates and attacking reagents in different organic reactions.
BP202T.3	To illustrate the IUPAC nomenclature of different organic compounds.
BP202T.4	To build the knowledge of essential reactions to prepare organic compounds.
BP202T.5	To distinguish different substitution and elimination reactions and to examine the several identification tests of organic compounds.
BP202T.6	To elaborate different named reactions and its applications in carbonyl compounds and carboxylic acids.

Course Name: Applied biochemistry and clinical pathology (Theory)

Course code: 203T, I.B.Pharmacy, Second Semester.

BP203T.1	To remember the properties, biological significance and metabolic reactions of carbohydrates, amino acids, proteins and lipids.
BP203T.2	To understand the biological role of vitamins, minerals and hormones.
BP203T.3	To apply the concept of catalytic activity and enzyme inhibition in design of new drugs and factors affecting enzyme action.
BP203T.4	To distinguish the phases and mechanism of detoxification.
BP203T.5	To appraise the principles and clinical significance involved in the analysis of blood and urine samples.
BP203T.6	To discuss the metabolism of carbohydrates, amino acids, proteins and lipids in the body.

Course Name: Applied biochemistry and clinical pathology (Practical)

Course code: 209P,I.B.Pharmacy, Second Semester.

BP209P.1	To remember the effect of temperature, pH and substrate concentration on salivary amylase activity.
BP209P.2	To understand the qualitative analysis of carbohydrates, proteins and amino acids.
BP209P.3	To identify the amount of glucose present in urine by BQR method.
BP209P.4	To examine the constituents present in the urine and its clinical significance.
BP209P.5	To determine tyrosine using calorimeter and valine by formal titration.
BP209P.6	To elaborate the clinical significance of serum cholesterol, glucose and creatinine in blood and urine samples.

Course Name: Pharmaceutical Chemistry – I [Organic – I] (Practical)

Course code:BP208P, I.B.Pharmacy, First and Second Semesters.

BP208P.1	To explain laboratory safety guidelines, apparatus and glassware used in pharmaceutical chemistry laboratory.
BP208P.2	To illustrate the determination of physical constants of organic compounds.
BP208P.3	To demonstrate various filtration and crystallization techniques.
BP208P.4	To synthesize and purify the selected organic compounds and to determine the reaction mechanisms.
BP208P.5	To analyze mono functional group pharmaceutical organic compounds by systematic qualitative analysis.

Course Name: Environmental Sciences (Theory);

Course code: BP206T, First and Second Semesters.

BP206T.1	To explain characteristic features, structures and functions of ecosystems.
BP206T.2	To compare various environment and natural resources management.
BP206T.3	To develop knowledge on biodiversity and in conservation to improve the global environment.
BP206T.4	To categorize local and global issues and environmental pollutions and to assess the impact of economy.
BP206T.5	To distinguish various environmental acts and monitoring of environmental convergence.
BP206T.6	To discuss the effects of environmental problems and their impact on society.

Course Name: Pharmaceutical Engineering – I (Theory);

Course code: BP304T II.B.Pharmacy, Third Semester.

BP304T.1	To outline the fundamentals of material and energy balance, units and dimensions in engineering calculations.
BP304T.2	To gain knowledge on unit operations, unit processes, chemical technology, laboratory, pilot scale and industrial scale operations.
BP304T.3	To compare flow of fluids; transportation of solids and fluids.
BP304T.4	To understand the important materials used in pharmaceutical plant construction.
BP304T.5	To explain the concept of corrosion and predict the industrial hazards.
BP304T.6	To elaborate the concepts of humidity and air conditioning, size reduction, size separation and mixing.

Course Name: Pharmaceutical Chemistry – II [Organic – II] (Theory)

Course code: 301T, II.B.Pharmacy, Third Semester.

BP301T.1	To define the nomenclature, preparation, reactions and uses of heterocyclic compounds.
BP301T.2	To explain the rules of aromaticity, preparation methods and reactions of organic compounds.
BP301T.3	To utilize the various reagents and study their applications in organic synthesis.
BP301T.4	To categorize medicinal compounds based on their structure and medicinal uses.
BP301T.5	To explain the concept of stereochemistry.
BP301T.6	To create interest in polynuclear aromatic hydrocarbons and named reactions.

Course Name: Pharmaceutical chemistry-II (Practical);

Course code: 305P, II.B.Pharmacy, Third Semester.

BP305P.1	To recall the uses of various reagents in the synthesis of organic compounds.
BP305P.2	To explain qualitative analysis of organic compounds.
BP305P.3	To experiment with the separation of organic binary mixture.
BP305P.4	To build the synthesis of organic compounds by known reactions.
BP305P.5	To analyze mixtures of pharmaceutical organic compounds.
BP305P.6	To elaborate the significance of various aspects of stereochemistry and poly nuclear hydrocarbons.

Course Name: Physical pharmaceutics-II (Theory);

Course code: 403T, II.B.Pharmacy,Fourth Semester.

BP403T.1	To recall the intermolecular forces and states of matter, phase equilibrium and phase rule.
BP403T.2	To explain laws of thermodynamics, free energy functions and applications.
BP403T.3	To explain the electromotive force, pH, oxidation - reduction systems and buffered isotonic systems.
BP403T.4	To relate the different viscometers and compare viscosities.
BP403T.5	To construct gablenski diagram and relate Beer-Lamberts law to the concepts of photochemistry.
BP403T.6	To enumerate physical properties of drug molecules and properties of solutions of electrolytes.

Course Name: Physical pharmaceutics-II (Practical);

Course code: 407P,II.B.Pharmacy, Fourth Semester

BP407P.1	To match the solubility of salicylic acid in various solvents.
BP407P.2	To illustrate the density of the given solid and liquid samples.
BP407P.3	To apply the given data for the determination of pKa by half neutralization and graphical methods.
BP407P.4	To compare the surface tension determined by drop number and drop count methods.
BP407P.5	To assess the viscosity of the given sample using Ostwald's viscometer.
BP407P.6	To establish an upper consolute temperature for phenol water system and to study the effect of sodium chloride on critical solution temperature.

Course Name: Pharmaceutical Microbiology (Theory);

Course code: 303T, II.B.Pharmacy, Third Semester.

BP303T.1	To find and select the desired or useful microorganism and sterilization methods.
BP303T.2	To relate the mechanisms of drug action (anti microbial) to the new substances derived.
BP303T.3	To develop different screening methods to identify disease state.
BP303T.4	To analyze the given anti microbial agent for its effective concentrations.
BP303T.5	To evaluate the bacteriostatic and cidal effects of new compounds.
BP303T.6	To solve the problem of spread of infections by creating awareness on possible outbreaks of different diseases.

Course Name: Physical Pharmaceutics – I (Theory);

Course code:302T, II.B.Pharmacy, Third Semester.

BP302T.1	To state the solubility and distribution phenomenon and to describe the complexation.
BP302T.2	To summarize the methods and principles of stabilization, rates and orders of reaction.
BP302T.3	To understand and apply the interfacial phenomenon.
BP302T.4	To compare the types and properties of colloids and macromolecular systems.
BP302T.5	To justify the micromeritics of powders as well as rheological systems.
BP302T.6	To evaluate the course dispersions and to predict their rheological and interfacial properties.

Course Name: Physical Pharmaceutics – I (Practical);

Course code:306P, II.B.Pharmacy, Third Semester.

BP306P.1	To understand the concept of surface tension and stability of coarse dispersions.
BP306P.2	To recognize the micromeritics of powders, determine the globule size of an emulsion and the effect of phase volume ratio on stability of emulsion.
BP306P.3	To study and relate the accelerated stability testing of tablet formulations.
BP306P.4	To assess the HLB value, critical micellar concentration of surfactants and explain complexation phenomenon.
BP306P.5	To study the adsorption of oxalic acid on charcoal and to evaluate the particle size by stokes method.
BP306P.6	To determine the first order rate constant associated with decomposition of pharmaceuticals.

Course Name: Pharmaceutical Microbiology (Practical);

Course code: 307P, II.B.Pharmacy, Third Semester.

BP307P.1	To select suitable sterilization procedure for sterilizing different pharmaceutical preparations.
BP307P.2	To demonstrate aseptic transfer and screening methods.
BP307P.3	To experimentally determine the characteristic features of microbes with respect to staining.
BP307P.4	To test the efficiency of antimicrobial agents.
BP307P.5	To determine the sensitivity of organisms to antibiotics and new compounds.
BP307P.6	To design experimental procedures to identify unknown compounds for antimicrobial activity.

Course Name: Pharmaceutical Engineering

Course code:304T,II.B.Pharmacy, Third Semester.

BP304T.1	To recall the mechanisms of heat transfer.
BP304T.2	To illustrate the mechanisms of drying, operation and applications of various dryers.
BP304T.3	To apply the principle of evaporation in the working of different evaporators.
BP304T.4	To analyze the principle and working of distillators and their applications.
BP304T.5	To assess the role of solubility curve in the selection of crystallizers.
BP304T.6	To assemble the extraction, centrifugation and filtration equipment and to explain their working processes.

Course Name: Pharmaceutical Engineering (Practical);

Course code:308P,II.B.Pharmacy, Third Semester.

BP308P.1	To describe the equipment related to heat transfer, milling, filtration, drying, crystallization, evaporation and extraction.
BP308P.2	To summarize the factors affecting the rate of filtration and centrifugation.
BP308P.3	To determine wet bulb and dry bulb temperatures and to plot the humidity charts.
BP308P.4	To calculate the radiation constant, rate of evaporation and crystallization.
BP308P.5	To analyze the moisture content, drying rate from the drying curves.
BP308P.6	To evaluate the size separation by sieving method and size reduction by ball mill.

Course Name: Pharmaceutical Chemistry – III [Medicinal – I] (Theory)

Course code: 401T, II.B.Pharmacy, Fourth Semester.

BP401T.1	To remember various classes of medicinal compounds, their properties and clinical uses.
BP401T.2	To compare the physicochemical parameters of drugs with biological action.
BP401T.3	To interpret the relationship between the structure and biological activity of selected categories of drugs.
BP401T.4	To apply the knowledge of medicinal compounds and their mechanism of action in the treatment of various diseases.
BP401T.5	To design the synthetic routes for medicinal compounds.
BP401T.6	To discuss the various plant products used in chemotherapy.

Course Name: Pharmaceutical Jurisprudence (Theory);

Course code:505T, III.B.Pharmacy, Fifth Semester.

BP505T.1	To remember the code of ethics of pharmacist, legislation to regulate the profession of pharmacy.
BP505T.2	To explain the pharmacy act 1948 and outline various professional bodies, their constitution and functions.
BP505T.3	To describe the Drugs and cosmetics act 1940, Drugs and cosmetic rules 1945 and list various schedules.
BP505T.4	To explain other legislations relating to pharmaceutical industry and profession such as Indian patent and designs act 1970, Medical termination of pregnancy act, Shops and establishments act and prevention of cruelty to animals act.
BP505T.5	To discuss legislations to control the advertisements, excise duties and price of drugs.
BP505T.6	To elaborate the legislations to control the operations regulating the dangerous drugs, poisons and opium.

Course Name: English and communication skills [Language laboratory] (Practical)

Course code: 111P, I.B.Pharmacy, First Semester.

BP111P.1	To understand the basic concepts of functional and advance grammar.
BP111P.2	To learn different levels of vocabulary and to remember synonyms and antonyms of basic words.
BP111P.3	To pronounce words with proper accent and to understand the common errors in pronunciation.
BP111P.4	To apply verbal and non verbal communication skills in presentation.
BP111P.5	To speak and write confidently using communication principles.
BP111P.6	To develop skills required for preparing a resume and handling an interview.

Course Name: Pharmaceutical Chemistry – IV [Medicinal – II] (Theory);

Course code: 501T,III.B.Pharmacy, Fifth Semester.

BP501T.1	To explain the classification of drugs by quoting some examples.
BP501T.2	To define and write chemistry, mode of action and therapeutic uses of drugs.
BP501T.3	To relate the structural modifications of the drugs with their biological activity.
BP501T.4	To outline the synthetic schemes for medicinal compounds.
BP501T.5	To adopt various drug discovery approaches in designing new molecules.
BP501T.6	To discuss the importance of physicochemical properties in relation to drug action.

Course Name: Pharmacognosy - I (Theory);

Course code:405T, II.B.Pharmacy, Fourth Semester.

BP405T.1	To understand the scope and development of pharmacognosy.
BP405T.2	To illustrate cultivation, collection and processing of crude drugs.
BP405T.3	To build the systematic pharmacognostic study of crude drugs such as carbohydrates, proteins, enzymes, tannins, resins and fibers.
BP405T.4	To analyze the quality of crude drugs by various methods.
BP405T.5	To relate metabolic pathways for the formation of secondary metabolites.
BP405T.6	To create and evaluate the crude drugs by identifying the types of adulterants using different methods.

Course Name: Pharmacognosy - I (Practical);

Course code:409P, II.B.Pharmacy, Fourth Semester.

BP409P.1	To remember different morphological and microscopical characteristic features of crude drugs.
BP409P.2	To classify the wide variety of crude drugs and their sources by different characters.
BP409P.3	To understand the cellular structure of crude drugs.
BP409P.4	To evaluate the crude drugs by quantitative evaluation methods.
BP409P.5	To evaluate the crude drugs by physical methods of evaluation.
BP409P.6	To evaluate the crude drugs by chemical methods of evaluation.

Course Name: Pharmacology – I(Theory);

Course code:404T, II.B.Pharmacy, Fourth Semester.

BP404T.1	To understand the concepts of routes of administration, drug interaction, ADRs, SAR, receptors, drug toxicity, agonism and antagonism.
BP404T.2	To summarize the pharmacology of drugs acting on autonomic nervous system.
BP404T.3	To identify the effect of drugs used as local anesthetics and diuretics.
BP404T.4	To categorize the pharmacology of major classes of drugs acting as general anesthetics, analgesics and anti inflammatory agents.
BP404T.5	To appraise the pharmacology of drugs acting on central nervous system.
BP404T.6	To predict the affect of various drugs acting against gastro intestinal complications.

Course Name: Pharmacology – II (Theory);

Course code: 703, III.B.Pharmacy, Fifth Semester.

BP503T.1	To summarize the theoretical considerations and principles of biological assays.
BP503T.2	To identify the relative pros and cons in the use of drugs for various cardiac complications.
BP503T.3	To outline the major classes of drugs currently used in medical practice for treatment of allergic reactions and respiratory complications.
BP503T.4	To analyze the mechanism of action of chemotherapeutic agents and their role in the treatment of various infectious diseases.
BP503T.5	To assess the selection of most appropriate drugs for effective pharmacotherapy of various hormone related complications.
BP503T.6	To predict the basic principles of toxicology and clinically managing the poisoned patient.

Course Name: Pharmacognosy – II (Theory);

Course code:504T, IIIB.Pharmacy, Fifth Semester.

BP504T.1	To remember and understand the selected crude drugs.
BP504T.2	To outline the systematic pharmacognostic study of various crude drugs such as glycosides, alkaloids, volatile oils, lipids etc.,
BP504T.3	To understand chemical constituents and uses of crude drugs.
BP504T.4	To create a strategic approach towards ayurvedic drugs.
BP504T.5	To develop the skills and knowledge of tissue culture in the production of pharmaceuticals.
BP504T.6	To improve the orientation of the students by giving broad spectrum of knowledge on secondary metabolites.

Course Name: Pharmacology – II (Practical);

Course code:507P, III.B.Pharmacy, Fifth Semester.

BP507P.1	To remember and learn basic as well as advanced equipments used in experimental pharmacology.
BP507P.2	To interpret the effects of various drugs (including local anesthetics) on rabbit eye in correlation with humans.
BP507P.3	To demonstrate the dose response relationships using living/isolated animal tissue preparation.
BP507P.4	To analyze the drug concentrations by various bioassay methods using animal simulator softwares.
BP507P.5	To adapt the importance of ethical requirements for performing animal experiments and biological waste management.
BP507P.6	To predict the effect of agonist and antagonist on dose response curve.

Course Name: Pharmacognosy – II (Practical); **Course code:**508P

III B.Pharmacy, Fifth Semester.

BP508P.1	To gain knowledge in study of crude drug from large scale and small scale processing, collection, preservation and storage of crude drugs.
BP508P.2	To remember the wide variety of the crude drugs and their sources by morphological characteristics.
BP508P.3	To understand the morphological and microscopical features of selected crude drugs.
BP508P.4	To analyze and evaluate the powdered crude drug samples by morphological and microscopical characteristics.
BP508P.5	To evaluate the powder mixture and to report the types of adulterants and substituents present.
BP508P.6	To create and evaluate profitable tissue and seeds for germination by using tissue culture.

Course Name: Medicinal Chemistry – III [Natural Products] (Theory)

Course code:601T,III.B.Pharmacy, Sixth Semester.

BP601T.1	To remember different categories of natural products.
BP601T.2	To gain knowledge of natural product applications for good health.
BP601T.3	To apply the knowledge of isolation of natural products.
BP601T.4	To discuss the chemistry, interrelationship and synthesis of various classes of natural products.
BP601T.5	To assess the quality of natural products by various qualitative and quantitative tests.
BP601T.6	To elaborate the stability, purity and quality of various classes of natural products.

Course Name: Biopharmaceutics and Pharmacokinetics (Theory);

Course code: 604, III.B.Pharmacy, Sixth Semester.

BP604T.1	To recall basic concepts of drug absorption, disposition and modified drug release dosage forms.
BP604T.2	To understand various pathways of drug absorption, disposition and summarize the factors affecting pharmacokinetics of drugs.
BP604T.3	To apply the pharmacokinetic models for determination of various pharmacokinetic parameters.
BP604T.4	To analyze the bioavailability parameters of drugs that follows linear and non linear pharmacokinetics.
BP604T.5	To interpret the factors influencing the design of sustained and controlled release dosage forms.
BP604T.6	To formulate various oral, parenteral and topical novel drug delivery systems.

Course Name: Quality Assurance (Theory)

Course code: 606, III B. Pharmacy, Sixth Semester.

BP606T.1	To recall the concepts of GMP, validation, calibration and ICH guideline along with computer applications.
BP606T.2	To explain the validation and calibration methods for analytical instruments and to understand the concepts of sampling techniques for different types of analytical data.
BP606T.3	To make use of the ICH guidelines for harmonized good laboratory practices and to perform the calibration and qualification for analytical instruments according to regulatory guidelines.
BP606T.4	To find out the variations in good manufacturing practices while comparing the different types of international regulatory guidelines and to know about ISO 9000 series.
BP606T.5	To compare and conclude the analytical raw data with the help of statistical techniques and quality control charts.
BP606T.6	To design and adapt the SOPs and protocols for validation of method development and for validation of analytical equipment.

Course Name: Medicinal Chemistry – V [Natural Products] (Practical)

Course code: BP607P, III B.Pharmacy, SixthSemester.

BP607P.1	To recall various qualitative and quantitative tests to check the quality of natural products and to learn how to isolate natural products.
BP607P.2	To gain knowledge on chemical reactions or chemistry involved in various qualitative and quantitative procedures or tests.
BP607P.3	To experiment with practice of isolation and characterization of natural products from plant materials.
BP607P.4	To analyze the quality of natural products by qualitative and quantitative analysis.
BP607P.5	To analyze fats and oils by pharmacopoeial methods.

Course Name: Pharmaceutical Biotechnology (Theory);

Course code: 605T, III. B. Pharmacy, Sixth Semester.

BP605T.1	To find out different microbial conversions and relate the conversions that result in pharmaceutically important products.
BP605T.2	To be able to outline series of steps involved in fermentative production.
BP605T.3	To apply his/her knowledge in selection methods for good product outcomes and stabilize enzymes in a reaction.
BP605T.4	To be able to perform tests, to identify and assay the given pharmaceutical products with respect to microbes.
BP605T.5	To identify the importance of biotechnology methods in pharmacy.
BP605T.6	To develop possible biotechnological products important for human well being and schemes for their production.

Course Name: Instrumental Methods of Analysis (Theory);

Course code: BP701T, IV. B. Pharmacy, Seventh Semester.

BP701T.1	To learn the concepts of Instruments used in Pharmaceutical analysis and differentiate with volumetric techniques
BP701T.2	To attain the knowledge on quantification of ions by spectral methods.
BP701T.3	To learn the limitations and applications of the instrumental methods used in quantification and identification of analytes
BP701T.4	To be able to separate mixture of compounds through separation techniques
BP701T.5	To be able to understand the applications of the instrumental methods in various levels of analysis
BP701T.6	To learn the selection of instruments to analyse the organic or inorganic compounds.

Course Name: Industrial Pharmacy II (Theory);

Course code: BP702 T, IV.B.Pharmacy, Seventh Semester.

BP702T.1	To acquire the knowledge on process of Pilot plant scale up techniques used in pharmaceutical dosage forms
BP702T.2	To understand technology transfer protocol, licensing and related issues
BP702T.3	To have a deep knowledge on regulatory aspects of drug approval, clinical research and management of clinical studies.
BP702T.4	To learn on the quality management system and standards, NABL and GLP
BP702T.5	To acquire knowledge on Indian regulatory requirements Like CDSCO, COPP
BP703T.6	To know the laws and acts that regulates Pharma industry.

Course Name: Pharmacy Practice (Theory);

Course code: BP703T, IV. B. Pharmacy, Seventh Semester.

BP703T.1	To acquire the knowledge on hospitals and their organization, drug distribution systems in hospitals and hospital formulary.
BP703T.2	To understand store management methods and inventory control
BP703T.3	To demonstrate the knowledge of therapeutic drug monitoring, and able to identify drug related problems.
BP703T.4	To have knowledge on interpretation of selected laboratory results.
BP703T.5	To be aware of drug and poison information centers, emergency drug list preparation.
BP703T.6	To learn patient counseling to provide pharmaceutical care services

Course Name: Novel Drug Delivery Systems (Theory);

Course code: BP 704, IV. B. Pharmacy, Seventh Semester.

BP704.1	To recall basic concepts of modified drug release dosage forms and approaches of polymer selection for CDD Systems.
BP704.2	To understand the principle of micro-encapsulation. Bio-adhesion and osmotic pump.
BP704.3	To apply the concepts of TDD, GRDD and NPDD systems for effective drug delivery
BP704.4	To acquire the concepts of production of nano particles and monoclonal antibodies for targeted drug delivery.
BP704.5	To interpret the factors influencing the design of ocular drug delivery forms.
BP704.6	To learn the concepts and develop intra uterine devices

Course Name: Instrumental methods of Analysis (Practical)

Course code: BP705P, IV. B. Pharmacy, Seventh Semester.

BP704.1	To learn the concepts of quantitative estimation techniques.
BP704.2	To gain knowledge of handling of the instruments like HPLC, GC.
BP704.3	To apply the concepts of separation methods for sugars, amino acids, pigments etc.,
BP704.4	To have a knowledge on qualitative determination of organic compounds
BP704.5	To be able to perform assay of dosage forms by the application of UV/Vis spectrophotometry

Course Name: Practice school

Course code: BP708IV.B.Pharmacy, Seventh Semester.

BP708.1	To be able to handle the instruments used for research
BP708.2	To review the research methodologies through literature review
BP708.3	To design a plan of work and execute it accordingly.
BP708.4	To analyse the pre-formulation and preclinical studies
BP708.5	To understand the documentation process

Course Name: Biostatistics and Research methodology (Theory);

Course code: 801T, IV. B. Pharmacy, Eighth Semester.

BP804T.1	To understand the concepts of dispersion, variance and central tendency.
BP804T.2	To be able to use regression and probability for analysis of statistical data.
BP804T.3	To understand the need of research, research designs and its applications.
BP804T.4	To check the regression models to appropriately apply it for statistical analysis.
BP804T.5	To be able to choose the suitable factorial designs for the research methodology
BP804T.6	To understand the statistical softwares and their applications

Course Name: Social and Preventive Pharmacy;

Course code: BP802T, IV. B. Pharmacy, Eighth Semester.

BP802P.1	To relate the importance of social causes for the prevention and control of disease
BP802P.2	To get aware of personal hygiene, socio-cultural factors related to poor health
BP802P.3	To become aware of the objectives of the national health programmes
BP802P.4	To become familiar with the national programmes related to women, child, geriatric patients
BP802P.5	To learn about the various community service programmes on health conducted at rural and urban level
BP802P.6	To relate to the health promotion and education programmes for the improvement of rural sanitization.

Course Name: Pharmacovigilance (Theory);

Course code: BP805, IV. B. Pharmacy, Eighth Semester.

BP805.1	To acquire the knowledge on history and development of Pharmacovigilance, ADR's and management of adverse drug reactions
BP805.2	To understand the terminology in drug dictionary and coding
BP805.3	To learn the adverse events following immunization and also effective communication strategies.
BP805.4	To deeply understand the objectives of ICH guidelines
BP805.5	To learn the concepts of pharmacogenomics and applications.
BP805.6	To get aware of drug safety evaluation in special population.

Course Name: Advanced Instrumentation Techniques (Theory);

Course code: 811 ET, IV. B. Pharmacy, Eighth Semester.

BP811.1	To understand the concepts of advanced instruments suitable for drug analysis
BP811.2	To understand the separation of biological samples for quantitative analysis
BP811.3	To apply the knowledge of application of radio immune assay techniques
BP811.4	To learn the need for calibration of instruments and methods of calibration
BP811.5	To have a deep knowledge on validation of analytical method
BP811.6	To be able to choose the analytical instruments for various types of drug samples for quantitative and qualitative analysis



GIET SCHOOL OF PHARMACY

(SPONSORED BY SRI KOUNDINYA EDUCATIONAL SOCIETY)

(Affiliated to Andhra University, Approved by AICTE & PCI)

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COURSE OUTCOME

FIRST YEAR PHARM. D

Course Code	Name of the Course	Course outcome
1.1	Human Anatomy and Physiology	Students learn the basic concepts of human organ, location, function, parts with model
1.2	Pharmaceutics	Students will be exposed to various dosage forms. Preparation of emulsion, suspension.
1.3	Medicinal Biochemistry	Students will understand the biochemical facts and principles related to diagnosis
1.4	Pharmaceutical Organic Chemistry	Students will develop practical skills to meet industrial requirement
1.5	Pharmaceutical Inorganic Chemistry	It deals with fundamentals of analytical chemistry and also study of inorganic pharmaceutical and their monographs.
1.6	Remedial Biology	Students learn the basic aspects of botany and zoology and their relation with pharmaceutical sciences.
1.7	Remedial Mathematics	Know about the theory and their application in pharmacy

SECOND YEAR PHARM. D

Course Code	Name of the Course	Course outcome
2.1	Pathophysiology	Students will understand about pathogenesis of various diseases including symptoms, etiology etc
2.2	Pharmaceutical Microbiology	Students gain knowledge about various staining procedures, bacteria, viruses and various microorganisms. Fermentation process, micro biological bio assays, vaccines etc.
2.3	Pharmacognosy and Phytopharmaceuticals	Students gain knowledge over medicinal uses of various phytopharmaceuticals. Also learn the systematic pharmacognostical study of crude drugs.
2.4	Pharmacology - I	Drugs in CNS, CVS, General Pharmacology, autocooids can be learned
2.5	Community Pharmacy	Students will be able to do community pharmacy activities like patient counselling, heath screening services and creating awareness about various diseases
2.6	Pharmacotherapeutics - I	Students will be exposed to decide therapy for special populations and cardiac respiratory and endocrine disorders

THIRD YEAR PHARM. D

Course Code	Name of the Course	Course outcome
3.1	Pharmacology - II	The subject will help the students to learn about drugs acting on blood, chemotherapy, anti-microbial agents, advanced gene therapy, immunotherapy
3.2	Pharmaceutical Analysis	The course will help in imparting theoretical aspects, instrumentation and application of various techniques like spectroscopy, chromatography etc
3.3	Pharmacotherapeutics - II	Students will be knowing about the pathophysiology and management of diseases it will be helpful to optimize the therapy for better outcomes
3.4	Pharmaceutical Jurisprudence	Upon completion the students will have the knowledge of professional ethics, pharmaceutical legislations in India. Also about various acts and rules such as D& C act, DPCO, patent design act. Also about other laws prescribed by PCI from time to time.
3.5	Medicinal Chemistry	The subject helps the students for drug design and development process and to understand the SR, MOA, Dose, Uses including synthesis of medicinal compounds
3.6	Pharmaceutical Formulations	Students can learn about basics on drug formulations and various approaches of dosage form design

FOURTH YEAR PHARM. D

Course Code	Name of the Course	Course outcome
4.1	Pharmacotherapeutics – III	Gaining knowledge regarding the etiology, pathogenesis, signs and symptoms, diagnosis and management of various pathological disease conditions. Special preference to special population such as pediatrics, geriatrics, immunocompromised patients.
4.2	Hospital Pharmacy	Students will be able to do hospital pharmacy services to both inpatient and out patients like dispensing, distribution, stocking and billing
4.3	Clinical Pharmacy	Students will be able to do patient counselling, ward round participation, ADR reporting, interpretation. Various types of pharmaceutical care
4.4	Biostatistics and Research Methodology	Study on various methodologies like Mean, Median, mode, SD, ANOVA, Chi square test, T test, F Test.
4.5	Biopharmaceutics and Pharmacokinetics	The students will have the knowledge on basic concepts in biopharmaceutics, pharmacokinetics such as ADME, application of pharmacokinetics
4.6	Clinical Toxicology	Candidates can be able to know the knowledge of toxic symptoms produced due to intake of poisonous drugs and treatment

FIFTH YEAR PHARM. D

Course Code	Name of the Course	Course outcome
5.1	CR-Clinical Research	Gains knowledge regarding the pre-clinical studies, clinical studies scenario in India and other countries. Guidelines for clinical trials, designing of clinical trial documents and the ethical values to be observed during clinical trials.
5.2	PEPE - Pharmacoepidemiology and Pharmacoeconomics	Students will be knowing about the prevalence and incidence of disease conditions and economic burden of the diseases
5.3	CPPDM - Clinical Pharmacokinetics and Pharmacotherapeutic Drug Monitoring	Students will be exposed to regulations, drug-drug interactions, positive therapeutic outcomes by conduction therapeutic drug monitoring for various drugs
5.4	Clerkship	Gain knowledge regarding the collection of patient medication history, interview, provisional diagnosis critical analysis of prescriptions, assessment of drug-drug interactions, adverse drug interactions and bed side patient counseling
5.5.	Project	<p>All Pharm D students must complete a research project in their 5th year as a part of their curriculum</p> <p>Students will gain knowledge on research methodology, various types of clinical study design, informed consent and good clinical practice guidelines</p> <p>Publishing their research project will give additional benefit to their careers</p>
6. Internship		Students will be able to do critical analysis of prescriptions providing pharmacist interventions, drug information services, assessment of drug-drug interactions, adverse drug reactions and bed side patient counselling. The pharmacotherapy case presentations has a specific format i.e. SOAP (subjective, objective, assessment and plan) Oral presentation about the real time cases will give knowledge to make patient specific decisions to produce better outcome and to increase the quality of life of patients.

GIET SCHOOL OF PHARMACY
PROGRAMME SPECIFIC OUTCOMES

M PHARMACY

MASTER OF PHARMACY (PHARMACEUTICAL ANALYSIS)

- **PSO 1:** Able to perform qualitative and quantitative analysis of drugs in different matrices by various spectroscopic, electro-analytical and chromatographic techniques
- **PSO 2:** Able to perform stability studies, impurity profiling and metabolite profiling of drugs by hyphenated analytical techniques
- **PSO 3:** Thorough knowledge about quality control, quality assurance of pharmaceuticals and regulatory guidelines

MASTER OF PHARMACY (PHARMACEUTICS)

- **PSO 1:** Academic Excellence: To acquire in-depth knowledge and adequate scientific information regarding basic principles of Pharmaceutics and its application in design of dosage form.
- **PSO 2:** Fundamental Skill: To produce research associates with strong fundamental concept and high technical competence in Novel drug delivery system to serve the need of F&D and Production department of pharmaceutical industry.
- **PSO 3:** Presentation Skills: The postgraduate student should able to write, interpret and communicate effectively and scientifically to accomplish the requirements of Regulatory affairs department.

MASTER OF PHARMACY (QUALITY ASSURANCE)

- **PSO 1:** Academic Excellence: To attain thorough knowledge and ample scientific information regarding basic principles of Pharmaceutical Analysis and its application in built up the quality in pharmaceutical product.
- **PSO 2:** Fundamental Skill: To create analyst with strong basic concept and high technical competence in sophisticated analytical instrument handling and troubleshooting to serve the need of Analytical development laboratory.
- **PSO 3:** Presentation Skills: The postgraduate student should able to write, interpret and communicate effectively and scientifically to fulfill the desires of Validation and Quality Affairs department.

MASTER OF PHARMACY (PHARMACOLOGY)

- **PO 1: Knowledge:** Students will have strong theoretical background along with necessary skills in pharmaceutical sciences and the ability to apply them in research and development.
- **PO 2: Core Competence:** Students will be competent in the domain of specialization viz., Quality Assurance, Biological Evaluations, Regulatory Affairs, GMP, Research Methodology and Statistical Evaluation of data as per the requirement of pharmaceutical industry.
- **PO 3: Breadth:** Trained students will have practical efficiency in analytical techniques in drug and formulation development and in clinical research, new drug application and application of quality assurance in all aspects of drug research so that they are able to extend this knowledge to create new products for the benefit of life.
- **PO 4: Preparation:** Students will be prepared to excel in pharmaceutical research and also to succeed in pharmaceutical industry or academics through innovative teaching methodologies that stimulates students to self-learning and further their knowledge.
- **PO 5: Professionalism:** Students will be inculcated with professional values, effective research communication skills, prioritizing problems and solutions and an ability to view pharmaceutical issues in broader context.
- **PO 6: Evaluation:** The ability to evaluate important aspects of the matter they have studied, weigh the pros and cons of the ideology they adhere to in the field of pharmaceutical sciences.

MASTER OF PHARMACY (PHARMACEUTICAL TECHNOLOGY)

After successful completion of the program the graduate will be able to

- **PSO1:** Apply the principles of drug delivery system in the development of eco-friendly, efficacious dosage forms.
- **PSO2:** Develop an ability to undertake multidisciplinary tasks in the pharmaceutical quality system.
- **PSO3:** Analyze, criticize, organize, improvise and manage documents, data and information related to pharmaceutical production process.
- **PSO4:** Imbibe ethical practices and moral values in personal and professional endeavours.
- **PSO5:** Execute team based research to implement innovative solutions in the area of formulation, quality assurance and technology transfer.
- **PSO6:** Apply problem-based learning approach and analytical thinking in academic and professional life.
- **PSO7:** Validate the knowledge and skills gained through education to gain recognition in Pharmaceutical society and related field.

GIET SCHOOL OF PHARMACY

Program Outcomes (POs)

Program Outcomes- B. Pharm.

On the completion of the B. Pharm. program, a student will be able to:

1. Demonstrate knowledge of the basic pharmaceutical sciences and the ability to acquire, manage and use current information for problem solving.
2. Describe the synthesis, formulation, analysis and pharmacological aspects of drugs and pharmaceuticals.
3. Identify the rules and regulations involved in the drug discovery and development, manufacture, distribution and sale of medicines.
4. Observe record, analyze, criticize, organize, improvise and manage documents, data and information related to pharmaceutical products and practices.
5. Develop problem-based learning approach and analytical thinking in his/her academic and professional life.
6. Demonstrate the ability to plan and implement professional activities.
7. Act efficiently as a leader in the diverse areas of the profession.
8. Write, interpret and communicate effectively and scientifically.
9. Apply the knowledge and skills gained through education to gain recognition in professional circle and society.
10. Partnering with other health care communities to provide innovative solutions.
11. Create awareness in society about the effective and safe use of medicines.
12. Demonstrate eco-friendly products and processes to maintain public health.
13. Imbibe ethical practices and moral values in personal and professional endeavors.
14. Tackle future challenges through lifelong learning.

Program Outcomes (POs) - Pharm. D. and Pharm. D. (PB)

1. Demonstrate knowledge of pharmacy practice and the ability to acquire, manage and use current information for problem solving, patient-specific, population-specific, evidence-based care to promote safe and optimal pharmacotherapy outcomes.
2. Identify the rules and regulations involved in the drug discovery and development, distribution, sale and safe use of medicines and participate in the development of drug use policy.
3. Apply critical thinking skills, including investigation, application, analysis, creativity, synthesis and evaluation of information, data and documents related to drug, poison, clinical investigations, pharmaceutical care and practices.
4. Develop problem-based learning approach and analytical thinking in his/her academic and professional life.
5. Demonstrate the ability to plan and implement professional activities.
6. Act efficiently as a leader in the diverse areas of the profession.
7. Write, interpret and communicate effectively and scientifically.
8. Apply the knowledge and skills gained through education to gain recognition in professional circle and society.
9. Partnering with other health care communities to provide innovative solutions.
10. Create awareness in society about the effective and safe use of medicines.
11. Demonstrate eco-friendly products and processes to maintain public health.
12. Imbibe ethical practices and moral values in personal and professional endeavors.
13. Identify and implement cost-effective patient care and resource management practices that do not compromise quality of care.
14. Tackle future challenges through lifelong learning.

Program Outcomes (POs) – M. Pharm

On completion of the M. Pharm. program, a student will be able to:

1. Demonstrate knowledge of the basic pharmaceutical sciences and the ability to acquire, manage and use current information for problem solving.
2. Describe the formulation, analysis, pharmacological, pharmacognostical, biotechnological and regulatory aspects of drugs and biopharmaceuticals.
3. Identify the rules and regulations involved in the drug discovery and development, manufacture, distribution and sale of medicines.
4. Develop problem-based learning approach and analytical thinking in his/her academic and professional life.
5. Apply critical thinking skills, including investigation, application, analysis, creativity, evaluation of information, data and documents related to research investigation.
6. Demonstrate the ability to plan and implement professional activities.
7. Act efficiently as a leader in the diverse areas of the profession.
8. Imbibe the skills of scientific communication and research writing.
9. Apply the knowledge and skills gained through education to gain recognition in professional circle and society.
10. Develop interdisciplinary research with other health care communities to provide innovative solutions.
11. Participate in healthcare initiatives to create awareness in society about the effective and safe use of medicines.
12. Demonstrate eco-friendly products and processes to maintain public health.
13. Exercise ethical practices and moral values in personal and professional endeavours.
14. Tackle professional challenges through lifelong learning attitude.