



# GIET SCHOOL OF PHARMACY

(SPONSORED BY SRI KOUNDINYA EDUCATIONAL SOCIETY)

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

NH-16, Chaitanya Knowledge City, RAJAHMUNDRY – 533 294, E.G.District, (A.P.)

Tel : 0883 – 2484444, 6577444, Fax: 0883 – 2484444, 2484739.

## PROGRAMME: B.PHARMACY (COURSE OUTCOMES)

**Course Name:** Human Anatomy and Physiology (Theory);

**Course code:**101T, 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.

BP103T.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.
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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 coarse 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:** Pharmacy Practice (Theory);

**Course code:** 703T,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 techniques of manufacturing sterile products and methods to overcome incompatibilities.
BP703T.3	To demonstrate the knowledge of therapeutic drug monitoring, patient counseling, medication history interview and drug information resources and extend it for societal needs.
BP703T.4	To elaborate clinical aspects of selected disease states (etiology, pathogenesis, patient counseling) and aware of rational use of drugs.
BP703T.5	To evaluate pharmacokinetic and pharmacodynamic drug interactions and adverse drug reactions.
BP703T.6	To build the ability to handle prescription.

**Course Name:** Pharmaceutical Chemistry – IV [Natural Products] (Theory)

**Course code:** 702T, IV.B.Pharmacy, Seventh Semester. (2013 Regulation)

702T.1	To remember different categories of natural products.
702T.2	To gain knowledge of natural product applications for good health.
702T.3	To apply the knowledge of isolation of natural products.
702T.4	To discuss the chemistry, interrelationship and synthesis of various classes of natural products.
702T.5	To assess the quality of natural products by various qualitative and quantitative tests.
702T.6	To elaborate the stability, purity and quality of various classes of natural products.

**Course Name:** Project; **Course code:** 708 Professional Training

IV.B.Pharmacy, Seventh Semester.

708.1	To recall and identify the societal issues related to health and pharmaceuticals and to report the aims and objectives of the project.
708.2	To review and compare the literature on selected topic / problem / issue.
708.3	To design a plan of work and execute it accordingly.
708.4	To analyze and compile the results of the project.
708.5	To justify the objectives and summarize the reports.
708.6	To publish a paper or patent with acceptable limit of (<30%) plagiarism.

**Course Name:** Biopharmaceutics and Pharmacokinetics (Theory);

**Course code:** 803, IV.B.Pharmacy, Eighth Semester. (2013 Regulation)

803T.1	To recall basic concepts of drug absorption, disposition and modified drug release dosage forms.
803T.2	To understand various pathways of drug absorption, disposition and summarize the factors affecting pharmacokinetics of drugs.
803T.3	To apply the pharmacokinetic models for determination of various pharmacokinetic parameters.
803T.4	To analyze the bioavailability parameters of drugs that follows linear and non linear pharmacokinetics.
803T.5	To interpret the factors influencing the design of sustained and controlled release dosage forms.
803T.6	To formulate various oral, parenteral and topical novel drug delivery systems.



**Course Name:** Pharmaceutical Analysis – II (Theory);

**Course code:** 801T, IV. B. Pharmacy, Eighth Semester. (2013 Regulation)

801T.1	To understand selected instrumental analytical techniques (spectroscopic, chromatographic, electrochemical methods) and differentiate with volumetric analytical techniques.
801T.2	To gain knowledge on interaction of EMR with matter, affinity of matter with stationary phase and mobile phase, physical and chemical properties of matter, potential and conductivity differences in different aqueous and organic solutions.
801T.3	To build the analytical understanding at the level of atom, group and molecular structure of organic and inorganic compounds with different functional groups and their applications in pharmacy.
801T.4	To categorize different organic and inorganic compounds using suitable spectroscopy, chromatography, electrochemical, thermal and radio immuno assay.
801T.5	To elaborate various principles, theory and instruments employed for the characterization and analysis of drugs.
801T.6	To maximize knowledge of electron resonance spectroscopy, NMR and X-Ray diffraction techniques and electrochemical techniques.

**Course Name:** Pharmaceutical Analysis – II (Practical);

**Course code:** 802P, IV. B.Pharmacy, Eighth Semester. (2013 Regulation)

802P.1	To relate the importance of absorption maximum, electromotive force, dissociation constant and efficient compound separation for organic compounds.
802P.2	To understand the different principles involved in the qualification/quantification of pharmaceutical compounds by using different volumetric and instrumental methods.
802P.3	To experiment selected drugs by UV, Visible spectroscopy / electrochemical and chromatographical techniques.
802P.4	To analyze/characterize active pharmaceutical ingredient/excipients using advanced analytical techniques.
802P.5	To estimate the amount of moisture content by KF titrimetry and hardness of water by complexometry.
802P.6	To estimate the amount of sodium and potassium ions by flame photometry.

**Course Name:** Clinical pharmacy and Therapeutics (Theory);

**Course code:** 805, IV.B.Pharmacy, Eighth Semester. (2013 Regulations)

805.1	To acquire the knowledge on hospitals and their organization, drug distribution systems in hospitals and hospital formulary.
805.2	To understand techniques of manufacturing sterile products and methods to overcome incompatibilities.
805.3	To demonstrate the knowledge of therapeutic drug monitoring, patient counseling, medication history interview and drug information resources and extend it for societal needs.
805.4	To elaborate clinical aspects of selected disease states (etiology, pathogenesis, patient counseling) and aware of rational use of drugs.
805.5	To evaluate pharmacokinetic and pharmacodynamic drug interactions and adverse drug reactions.
805.6	To build the ability to handle prescription.

**Course Name:** Novel Drug Delivery Systems (Theory);

**Course code:** 806, IV.B.Pharmacy, Eighth Semester.(2013 Regulations)

806.1	To recall basic concepts of drug absorption, disposition and modified drug release dosage forms.
806.2	To understand various pathways of drug absorption, disposition and summarize the factors affecting pharmacokinetics of drugs.
806.3	To apply the pharmacokinetic models for determination of various pharmacokinetic parameters.
806.4	To analyze the bioavailability parameters of drugs that follows linear and non linear pharmacokinetics.
806.5	To interpret the factors influencing the design of sustained and controlled release dosage forms.
806.6	To formulate various oral, parenteral and topical novel drug delivery systems.