# B PHARMACY COURSE OUTCOMES

| Course Number & Couse Name | CO No | Course Outcome (CO) |
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| **BP101T Human Anatomy and Physiology-I (Theory)** | Upon completion of this course the graduate is able to | |
| | C101T1. | Explain the structural (both cellular and tissue) organization and various homeostatic mechanisms(a, e, f, i, j) |
| | C101T2. | Understand the structure and functions of joints, integumentary system and skeletal system(a, e, f, i, j) |
| | C101T3. | Differentiate the functions of blood, body fluids and lymph(a, e, f, i, j) |
| | C101T4. | Discuss the structure and functions of peripheral nervous system and special sensory organs(a, e, f, i, j) |
| | C101T5. | Describe the anatomy and physiology of heart and its disorders(a, e, f, i, j) |
| **BP102T Pharmaceutical Analysis I ( Theory)** | Upon completion of this course the graduate is able to | |
| | C102T1. | Identify the elemental impurities in pharmaceutical products using limit tests as per Indian Pharmacopoeia(a,c,d) |
| | C102T2. | Understand the concepts of acid-base and Non aqueous titrations(a,c,d) |
| | C102T3. | Discuss the principles and steps involved in gravimetric analysis, precipitation and complexometric titrations(a,c,d) |
| | C102T4. | Perform the different types of redox titrations(a,c,d) |
| | C102T5. | Analyze the compounds based on the principles of electrochemical methods like Conductometry, potentiometry and polarography(a,c,d) |
| **BP103T Pharmaceutics I (Theory)** | Upon completion of this course the graduate is able to | |
| | C103T1 | Understand the historical background of pharmacy profession and handling of prescription and pediatric dose calculations(a,c,f) |
| | C103T2 | Perform various pharmaceutical calculations and understand the powder and liquid dosage forms(a,c,f) |
| | C103T3 | Formulate and evaluate different kinds of monophasic and biphasic liquid dosage forms(a,c,f) |
| | C103T4 | Identify and solve pharmaceutical incompatibilities in prescriptions and to prepare suppositories(a,c,f) |
| | C103T5 | Prepare and evaluate different types of semisolid dosage forms(a,c,f) |
| **BP104T Pharmaceutical Inorganic Chemistry (Theory)** | Upon completion of this course the graduate is able to | |
| | C104T1 | Know the source of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals(a, c, f, k) |
| | C104T2 | Understand the importance of buffers,electrolytes and dental products(a, c, f, k) |
| | C104T3 | Know the pharmaceutical importance of gastrointestinal agents(a, c, f, k) |
| | C104T4 | Know the importance of miscellaneous inorganic compounds(a, c, f, k) |
| | C104T5 | Know the importance of radiopharmaceuticals.(a, c, f, k) |

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| **BP105T Communication skills (Theory)** | Upon completion of this course the graduate is able to | |
| | C105T1 | Understand the importance, barriers and perspectives of communication(b,e,h) |
| | C105T2 | Communicate effectively (Verbal and Non Verbal)(b,e,h) |
| | C105T3 | Acquire writing skills and listening skills(b,e,h) |
| | C105T4 | Develop presentation skills(b,e,h) |
| | C105T5 | Participate effectively in group discussion (b,e,h) |
| **BP106RMT Remedial Mathematics (Theory)** | Upon completion of this course the graduate is able to | |
| | C106RMT 1 | Apply the knowledge of partial fractions, logarithms,functions and limits for interpreting the pharmaceutical Problems (c, d) |
| | C106RMT 2 | Understand the theory and applications of matrices and determinant in solving pharmacokinetic equations(c, d) |
| | C106RMT 3 | Interpret the calculations using differential calculus(c, d) |
| | C106RMT 4 | Calculate the slope and other parameters using integrations(c, d) |
| | C106RMT 5 | Integrate the differential equations and laplace transform(c, d) |
| **BP106RBT Remedial Biology (Theory)** | Upon completion of this course the graduate is able to | |
| | C106RBT. 1 | Classify Monera, Protista, Fungi, Animalia and Plantae(a, d, e) |
| | C106RBT. 2 | Understand the cardiovascular, digestive and respiratorysystems in the human body(a, d, e) |
| | C106RBT. 3 | Describe the human excretory, nervous, endocrine and reproductive systems(a, d, e) |
| | C106RBT. 4 | Explain the photosynthesis, essential nutrients and nitrogen metabolism in plants(a, d, e) |
| | C106RBT. 5 | Differentiate cells, tissues, cell division and explain the plant respiration and growth(a, d, e) |
| **BP107P Human Anatomy and Physiology (Practical)** | Upon completion of this course the graduate is able to | |
| | C107P1 | Distinguish tissues and organs of the human body from histological slides(a, e, f, i, j) |
| | C107P2 | Identify axial and appendicular bones(a, e, f, i, j) |
| | C107P3 | Estimate the hemoglobin content and blood cell count(a, e, f, i, j) |
| | C107P4 | Determine the bleeding time, clotting time, erythrocyte sedimentation rate (ESR) and blood groups (a, e, f, i, j) |
| | C107P5 | Record blood pressure, heart rate and pulse rate(a, e, f, i, j) |
| **BP108P Pharmaceutical** | Upon completion of this course the graduate is able to | |
| | C108P1 | Conduct limit tests for chlorides, sulphates, Iron, Arsenic,Heavy metals as per IP(a, b, c, d) |
| | C108P2 | Perform acid base titrations(a, b, c, d) |

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| **Analysis I – (Practical)** | C108P3 | Understand oxidation and reduction methods(a, b, c, d) |
| | C108P4 | Demonstrate complexometric titrations(a, b, c, d) |
| | C108P5 | Carry out precipitation Titrations(a, b, c, d) |
| **BP109P Pharmaceutics I (Practical)** | Upon completion of this course the graduate is able to | |
| | C109P1 | Prepare syrups and elixirs(a, c) |
| | C109P2 | Formulate and dispense throat paints, medicated and non-medicated soap solutions(a, c) |
| | C109P3 | Develop various dosage forms like lotions, mixtures, gels, liniments and emulsions(a, c) |
| | C109P4 | Compound medicated powders and effervescent granules(a, c) |
| | C109P5 | Design the manufacturing process of suppositories and ointments(a, c) |
| **BP110P Pharmaceutical Inorganic Chemistry (Practical)** | Upon completion of this course the graduate is able to | |
| | C110P1 | Perform the limit tests for important ions.(a, b, d, k) |
| | C110P2 | Perform the modified limit tests.(a, b, d, k) |
| | C110P3 | Know the identification tests for important compounds(a, b, d, k) |
| | C110P4 | Test the purity of the important compounds(a, b, d, k) |
| | C110P5 | Prepare important inorganic pharmaceuticals(a, b, d, k) |
| **BP111P Communication skills ( Practical)** | Upon completion of this course the graduate is able to | |
| | C111P1 | Develop communication skills(b, e, h) |
| | C111P2 | Improve pronunciations(b, e, h) |
| | C111T3 | Differentiate direct and indirect speech(b, e, h) |
| | C111P4 | Acquire writing skills(b, e, h) |
| | C111P5 | Prepare scientific presentations and develop interview handling skills(b, e, h) |
| **BP112RBP Remedial Biology (Practical)** | Upon completion of this course the graduate is able to | |
| | C112P1 | Handle microscope for scientific examinations(a, d, e) |
| | C112P2 | Describe the anatomy and physiology of frog by using computer models(a, d, e) |
| | C112P3 | Identify bones(a, d, e) |
| | C112P4 | Determine blood groups and blood pressure(a, d, e) |
| | C112P5 | Estimate the tidal volume(a, d, e) |
| **BP201T** | Upon completion of this course the graduate is able to | |
| | C201T1 | Describe the organization of central nervous system(a, e, f, i, j) |

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| **Human Anatomy and Physiology II**<br><br>**(Theory)** | C201T2 | Explain the anatomy and physiology of gastrointestinal tract(a, e, f, i, j) |
| | C201T3 | Understand the respiratory and urinary systems(a, e, f, i, j) |
| | C201T4 | Discuss the structure and functions of endocrine glands (a, e, f, i, j) |
| | C201T5 | Recognize the importance of reproductive system andgenetics(a, e, f, i, j) |
| **BP202T**<br><br>**Pharmaceutical Organic Chemistry I – (Theory)** | Upon completion of this course the graduate is able to | |
| | C202T1 | Organic compounds( a, d, i, j) |
| | C202T2 | Alkanes, alkenes and conjugated dienes( a, d, i, j) |
| | C202T3 | Alkyl halides and alcohols( a, d, i, j) |
| | C202T4 | Carbonyl compounds( a, d, i, j) |
| | C202T5 | Aliphatic amines, carboxylic acids/amides/esters( a, d, i, j) |
| **BP203T Biochemistry (Theory)** | Upon completion of this course the graduate is able to | |
| | C203T1 | Understand the basic chemistry of biomolecules and bioenergetics( a, e, k) |
| | C203T2 | Understand the metabolism of carbohydrates in physiological and pathological conditions( a, e, k) |
| | C203T3 | Understand the metabolism of lipids and amino acids in physiological and pathological conditions.( a, e, k) |
| | C203T4 | Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and protiens( a, e, k) |
| | C203T5 | Understand the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes( a, e, k) |
| **BP204T Pathophysiology (Theory)** | Upon completion of this course the graduate is able to | |
| | C204T1 | Inflammation restoration(a, d, i, j) |
| | C204T2 | Cardiovascular, respiratory and excretory systems(a, d, i, j) |
| | C204T3 | Endocrine, nervous, gastrointestinal and blood(a, d, i, j) |
| | C204T4 | Cancer and skeletal system(a, d, i, j) |
| | C204T5 | Infectious diseases(a, d, i, j) |
| **BP205T Computer Applications in Pharmacy** | Upon completion of this course the graduate is able to | |
| | C205T1 | Understand the importance of Software's in the field of Pharmaceutical Sciences( c, d, k) |
| | C205T2 | Explain the databases and Web technologies in Pharmacy( c, d, k) |
| | C205T3 | Implement the knowledge of computers in Pharmacy( c, d, k) |
| | C205T4 | Discuss the concepts of bioinformatics and their impact in vaccine discovery( c, d, k) |

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| **(Theory)** | C205T5 | Execute data in preclinical development( c, d, k) |
| **BP206T Environmental sciences ( Theory)** | Upon completion of this course the graduate is able to | |
| | C206T1 | Understand the multidisciplinary nature of environmental Studies( a, b, k) |
| | C206T2 | Recognize renewable and non-renewable resources( a, b, k) |
| | C206T3 | Explain natural resources and their associated problems( a, b, k) |
| | C206T4 | Identify different ecosystems( a, b, k) |
| | C206T5 | Solve environmental problems( a, b, k) |
| **BP207P Human Anatomy and Physiology II (Practical)** | Upon completion of this course the graduate is able to | |
| | C207P1 | Identify various organs of the human body using models,charts, specimens and slides(a, e, i, j) |
| | C207P2 | Demonstrate the general neurological examination, positive and negative feedback mechanisms(a, e, i, j) |
| | C207P3 | Recognize different tastes(a, e, i, j) |
| | C207P4 | Record the body temperature and basal mass index(a, e, i, j) |
| | C207P5 | Determine the tidal volume and vital capacity of the lungsand perform the pregnancy diagnosis test(a, e, i, j) |
| **BP208P Pharmaceutical Organic Chemistry I (Practical)** | Upon completion of this course the graduate is able to | |
| | C208P1 | Determine the physical properties of organic compounds(a, e, c, g, i, j) |
| | C208P2 | Categorize the functional groups(a, e, c, g, i, j) |
| | C208P3 | Identify extra elements and determine the solubility oforganic compounds(a, e, c, g, i, j) |
| | C208P4 | Evaluate organic compounds(a, e, c, g, i, j) |
| | C208P5 | Synthesize derivatives of organic compounds(a, e, c, g, i, j) |
| **BP209P Biochemistry (Practical)** | Upon completion of this course the graduate is able to | |
| | C209P1 | Analyse carbohydrates in the given test samples (a, c, e, f) |
| | C209P2 | Identify proteins and amino acids in the given samples (a, c, e, f) |
| | C209P3 | Perform urine analysis (a, c, e, f) |
| | C209P4 | Assess the activity of enzymes (a, c, e, f) |
| | C209P5 | Estimate the blood glucose and serum creatinine levels (a, c, e, f) |
| **BP210P Computer Applications in Pharmacy (Practical)** | Upon completion of this course the graduate is able to | |
| | C210P1 | Design a questionnaire for a particular disease(c, d, k) |
| | C210P2 | Create a HTML web page, mailing labels, databases, invoice tables and queries in MS access(c, d, k) |
| | C210P3 | Store and retrieve the information of a drug and its adverse effects using online tools(c, d, k) |
| | C210P4 | Generate and print the reports from patient database (c, d, k) |
| | C210P5 | Export the tables, queries, forms and reports to web andXML pages (c, d, k) |
| **BP301T Pharmaceutical** | Upon completion of this course the graduate is able to | |
| | C301T1 | Benzene and its derivatives( a, c, j, k) |
| | C301T2 | Phenols, aromatic amines and aromatic acids( a, c, j, k) |

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| **Organic Chemistry II (Theory)** | C301T3 | Fats and oils( a, c, j, k) |
| | C301T4 | Polynuclear hydrocarbons( a, c, j, k) |
| | C301T5 | Cyclo alkanes( a, c, j, k) |
| **BP302T Physical Pharmaceutics I (Theory)** | Upon completion of this course the graduate is able to | |
| | C302T1 | Recall the importance of solubility of drugs in designing of dosage forms and diffusion principles in biological systems.( a, c, b, f) |
| | C302T2 | Explain the states of matter and understand the applications of various physicochemical properties of drug molecules to design dosage forms( a, c, b, f) |
| | C302T3 | Utilize the principles of Interfacial tention and the applications of surface active agents in drug solubilisation.( a, c, b, f) |
| | C302T4 | Analyze the concepts of complexation and protein binding in pharmacy( a, c, b, f) |
| | C302T5 | Discuss PH, buffers and their use in the stabilization of pharmaceutical formulations( a, c, b, f) |
| **BP303T Pharmaceutical Microbiology (Theory)** | Upon completion of this course the graduate is able to | |
| | C303T1 | Define the basics of microorganisms and their identification, cultivation and preservation( a, f, h, i, j, k) |
| | C303T2 | Explain the concepts of staining and sterilization process in different fields of science( a, f, h, i, j, k) |
| | C303T3 | Apply sterility testing for different pharmaceutical products( a, f, h, i, j, k) |
| | C303T4 | Analyze the vitamins and antibiotics by microbiological assays( a, f, h, i, j, k) |
| | C303T5 | Determine aseptic areas, development of different animal cell Cultures and their maintenance for various pharmaceutical procedures( a, f, h, i, j, k) |
| **BP304T Pharmaceutical Engineering (Theory)** | Upon completion of this course the graduate is able to | |
| | C304T1 | Outline the concepts of flow of fluids, size reduction and size separation(a,b,c,e) |
| | C304T2 | Demonstrate different types of heat transfer mechanisms and principles of evaporation and distillation(a,b,c,e) |
| | C304T3 | Categorize various drying and mixing processes and their application in pharmaceutical industry(a,b,c,e) |
| | C304T4 | Explain the principles and applications of filtration and centrifugation processes(a,b,c,e) |
| | C304T5 | Purpose and adopt different materials in pharmaceutical plant construction, corrosion and it's prevention(a,b,c,e) |
| **BP305P Pharmaceutical Organic Chemistry II (Practical)** | Upon completion of this course the graduate is able to | |
| | C305P1 | Understand different purification methods( a, d, j, k) |
| | C305P2 | Analyze fats and oils by various methods( a, d, j, k) |
| | C305P3 | Prepare pharmaceutical intermediates by electrophilic aromatic substitution reactions( a, d, j, k) |
| | C305P4 | Synthesize organic intermediates by oxidation and hydrolysis reactions( a, d, j, k) |
| | C305P5 | Prepare organic intermediatesby condensation and diazotization reactions( a, d, j, k) |

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| **BP306P**<br><br>**Physical Pharmaceutics I (Practical)** | Upon completion of this course the graduate is able to | |
| | C306P1 | Find the significance of physical properties such as solubility, surface tension, partition coefficient and pka in the design of dosage forms( a, c, d, f) |
| | C306P2 | Explain adsorption isotherms and determine freundlich-langmuir constant using activated charcoal( a, c, d, f) |
| | C306P3 | Apply Henderson –Hasselbalch equation for interpretation of pka value of drugs.( a, c, d, f) |
| | C306P4 | Determine the HLB value and critical micellar concentration of a surfactant( a, c, d, f) |
| | C306P5 | Estimate the stability constants of complexes by solubility and pH titration methods( a, c, d, f) |
| **BP307P Pharmaceutical Microbiology (Practical)** | Upon completion of this course the graduate is able to | |
| | C307P1 | List and prepare various culture media for the growth of microorganisms( a , c, d, e, h, j, k) |
| | C307P2 | Show, identify and isolate bacteria( a , c, d, e, h, j, k) |
| | C307P3 | Plan, select and demonstrate aseptic procedures( a , c, d, e, h, j, k) |
| | C307P4 | Test for assessment of the sterility of different pharmaceutical products( a , c, d, e, h, j, k) |
| | C307P5 | Estimate the potency of antibiotics( a , c, d, e, h, j, k) |
| **BP 308P Pharmaceutical Engineering (Practical)** | Upon completion of this course the graduate is able to | |
| | C308P1 | Recall basic principles involved in unit operations such as size reduction, size separation, distillation and drying(a,b,c,e) |
| | C308P2 | Demonstrate and explain about the construction, working, applications of pharmaceutical mixer, fluidized bed dryer and freeze dryer(a,b,c,e) |
| | C308P3 | Test for the radiation constant of brass, iron, unpainted and painted glass(a,b,c,e) |
| | C308P4 | Experiment with the process variables of filtration, evaporation and crystallization(a,b,c,e) |
| | C308P5 | Estimate the moisture content, loss on drying and construct drying curves for calcium carbonate and starch(a,b,c,e) |
| **BP401T Pharmaceutical Organic Chemistry III (Theory)** | Upon completion of this course the graduate is able to | |
| | C401T1 | Acquire the knowledge and understanding of the basic experimental principles of heterocyclic chemistry. ( a, c, f, k) |
| | C401T2 | Draw the structures and synthesize simple pharmaceutically active organic compounds having five and six membered heterocyclic compounds. ( a, c, f, k) |
| | C401T3 | Describe detailed mechanisms for common naming reactions ( a, c, f, k) |
| | C401T4 | Be able to run experimental techniques, procedures and safe laboratory practices ( a, c, f, k) |
| | C401T5 | Explain Stereo-chemical features including conformation and stereo electronic effects; Geometrical isomers ( a, c, f, k) |
| | Upon completion of this course the graduate is able to | |
| | C402T1 | Learn about new advancements in medicinal chemistry and comprehend the significance of how a drugs physicochemical attributes affect the ADME pathway( a, c, d, f, k) |

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| **BP402T Medicinal Chemistry-I (Theory)** | C402T2 | Categorize and comprehend the SAR, the mechanism of action, and the applications of medicines working on the sympathetic nervous system( a, c, d, f, k) |
| | C402T3 | List drugs and remember structures, mechanism of action, structure activity relationship, uses of drugs acting on cholinergic nervous system( a, c, d, f, k) |
| | C402T4 | Enlist the classifications, mechanism of action, structure activity relationship, synthetic methods and uses of drugs acting on central nervous system( a, c, d, f, k) |
| | C402T5 | Understand the classification, mechanism of action, structure-activity relationship, and narcotic and non-narcotic analgesics( a, c, d, f, k) |
| **BP403T Physical Pharmaceutics II (Theory)** | Upon completion of this course the graduate is able to | |
| | C403T1 | List the types and properties of colloids and relate their stability with formulation aspects ( a, b, c, d, j) |
| | C403T2 | Classify Newtonian and Non Newtonian systems and to interpret rheological properties and to apply the concept of Deformation in solids ( a, b, c, d, j) |
| | C403T3 | Inspect the properties of coarse dispersions ( a, b, c, d, j) |
| | C403T4 | Determine the types and properties of powders and formulation aspects ( a, b, c, d, j) |
| | C403T5 | Estimate the rate and order of a reaction, decomposition and stability of various medicinal agents. ( a, b, c, d, j) |
| **BP404T Pharmacology I (Theory)** | Upon completion of this course the graduate is able to | |
| | C404T1 | Apply the concepts of pharmacokinetics of various drugs acting on human body on regular day today life.( a, e, f, i, j) |
| | C404T2 | Evaluate the pharmacological aspects of drugs acting on ANS( a, e, f, i, j) |
| | C404T3 | Analyze the pharmacology of drugs acting on CNS( a, e, f, i, j) |
| | C404T4 | Understand the information pertaining to the principles of pharmacodynamics of drugs acting on human body( a, e, f, i, j) |
| | C404T5 | Remember the concepts of drug addiction, abuse and correlate them with their negative impact on society( a, e, f, i, j) |
| **BP405T Pharmacognosy and Phytochemistry I (Theory)** | Upon completion of this course the graduate is able to | |
| | C405T1 | Distinguish the organized and unorganized drugs; and understand the importance of quality control of crude drugs.( a, f, h) |
| | C405T2 | Describe the methods of cultivation, collection, processing and storage of crude drugs.( a, f, h) |
| | C405T3 | Explain the importance of plant tissue cultures and applications of edible vaccines.( a, f, h) |
| | C405T4 | Understand the role and importance of Pharmacognosy in various Traditional systems of medicines.( a, f, h) |
| | C405T5 | Discuss the importance of various classes of natural drugs( a, f, h) |
| **BP406P** | Upon completion of this course the graduate is able to | |
| | C406P1 | Remember the essential requirements for drug synthesis and assay determinations( a, c, d, f, k) |
| | C406P2 | Synthesize drugs and their intermediates( a, c, d, f, k) |

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| **Medicinal Chemistry I – (Practical)** | C406P3 | Evaluate assay of drugs by aqueous titration methods( a, c, d, f, k) |
| | C406P4 | Evaluate assay of drugs by non-aqueous titration methods( a, c, d, f, k) |
| | C406P5 | Determine partition co-efficient of drugs.( a, c, d, f, k) |
| **BP407 P Physical Pharmaceutics II (Practical)** | Upon completion of this course the graduate is able to | |
| | C407P1 | Find the derived properties of powders and to demonstrate particle size determination of powders(a,c,d,j) |
| | C407P2 | Experiment with viscosity determination of liquids and semi-solids(a,c,d,j) |
| | C407P3 | Inspect the properties of coarse dispersions(a,c,d,j) |
| | C407P4 | Estimate the rate of a reaction(a,c,d,j) |
| | C407P5 | Estimate the Accelerated stability of various medicinal agents(a,c,d,j) |
| **BP408P Pharmacology I (Practical)** | Upon completion of this course the graduate is able to | |
| | C408P1 | Create certain drugs and techniques by studying the maintenance of laboratory animals.(a,d,i,j) |
| | C408P2 | Analyze the concepts of various routes of drug administration and blood withdrawal techniques(a,d,i,j) |
| | C408P3 | Apply the concepts of drugs affecting ciliary motility on animal experimentation.(a,d,i,j) |
| | C408P4 | Evaluate the effect of drugs acting on CNS.(a,d,i,j) |
| | C408P5 | Understand the mechanism of action of locally acting drugs by performing animal experimentation(a,d,i,j) |
| **BP409P Pharmacognosy and Phytochemistry I (Practical)** | Upon completion of this course the graduate is able to | |
| | C409P1 | Perform qualitative chemical tests to identify chemical constituents of crude drugs.(b,c,d,k) |
| | C409P2 | Identify the leaf drugs by analyzing leaf surface data.(b,c,d,k) |
| | C409P3 | Evaluate the purity of powdered crude drugs based on microscopic measurements.(b,c,d,k) |
| | C409P4 | Assess quality and purity of crude drugs(b,c,d,k) |
| | C409P5 | Demonstrate the quantitative microscopy.(b,c,d,k) |
| **BP501T Medicinal Chemistry II (Theory)** | Upon completion of this course the graduate is able to | |
| | C501T1 | Gain knowledge on the classification, mechanism of action, SAR, synthesis and therapeutic uses of Antihistamine drugs. ( a, c, d, f, k) |
| | C501T2 | Understand the classification, mechanism of action, SAR, synthesis and therapeutic uses of Anti-anginal and Antihypertensive drugs ( a, c, d, f, k) |
| | C501T3 | Recall the classification, mechanism of action, SAR, synthesis and therapeutic uses of Drugs acting on Cardiovascular system( a, c, d, f, k) |
| | C501T4 | Enumerate the classification, mechanism of action, SAR, synthesis and therapeutic uses of Drugs acting on Endocrine system( a, c, d, f, k) |
| | C501T5 | Gain knowledge on the classification, mechanism of action, SAR, synthesis and therapeutic uses of Antidiabetic drugs. ( a, c, d, f, k) |
| | Upon completion of this course the graduate is able to | |

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| **BP502T Industrial Pharmacy I (Theory)** | C502T1 | Outline the objectives and applications of preformulation studies in development and stability of dosage forms(a,b,c,e) |
| | C502T2 | Discuss the formulation, manufacturing, coating and quality control tests of tablets. To understand the formulation, manufacturing of liquid orals(a,b,c,e) |
| | C502T3 | Understand the pharmaceutical aspects of hard and soft gelatin capsules and manufacturing of pellets(a,b,c,e) |
| | C502T4 | Describe the manufacturing and quality control tests of parenterals and ophthalmic preparations(a,b,c,e) |
| | C502T5 | Elaborate the formulation and evaluation of cosmetics, pharmaceutical aerosols and science of packaging of materials.(a,b,c,e) |
| **BP503T Pharmacology II (Theory)** | Upon completion of this course the graduate is able to | |
| | C503T1 | Relate the relative pros and cons in the use of drugs for various cardiac complications.(a, c, d, j) |
| | C503T2 | Illustrate the drugs acting on hematopoietic system, shock diuretics and anti-diuretics.(a, c, d, j) |
| | C503T3 | Analyze and summarize the drugs acting on endocrine system(a, c, d, j) |
| | C503T4 | Appraise the physiological role of sex hormones and to assess the effects of oral contraceptives and drugs acting on the uterus(a, c, d, j) |
| | C503T5 | Predict principles of bioassay and to construct the bioassay methods of various compounds(a, c, d, j) |
| **BP504T Pharmacognosy and Phytochemistry II (Theory)** | Upon completion of this course the graduate is able to | |
| | C504T1 | Outline the Metabolic pathways in higher plants and their determination.(a, f, h) |
| | C504T2 | Summarize the chemistry, biosources, therapeutic uses, and commercial applications of the secondary metabolites(a, f, h) |
| | C504T3 | Explain the Isolation, Identification and Analysis of Phytoconstituents(a, f, h) |
| | C504T4 | Elaborate industrial production, estimation and utilization of phytoconstituents.(a, f, h) |
| | C504T5 | Demonstrate the extraction and chromatographic techniques using crude drugs(a, f, h) |
| **BP505T Pharmaceutical Jurisprudence (Theory)** | Upon completion of this course the graduate is able to | |
| | C505T1 | Tell the basic concepts of import, manufacture and conditions for grant of license in different facilities in drug and cosmetics act(a, b, k) |
| | C505T2 | Classify the different schedules and explain sale, labeling. Outline the administration of the act. Describe the government drug analyst and drug inspector(a, b, k) |
| | C505T3 | Identify the different statutory bodies like PCI, state and joint state pharmacy council's. Applying the knowledge in construction of in-bond and outside bond and list the narcotic drugs and psychotropic substances and categorize different forms of narcotic and psychotropic substances(a, b, k) |

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| | C505T4 | Justify the prohibition of advertisements in drugs and magic remedies. Explain the importance of animal ethics. Estimate the price of formulations(a, b, k) |
| | C505T5 | Discuss various pharmaceutical legislations. Elaborate the theory of patents. Create awareness in pharmacist in various fields(a, b, k) |
| **BP506P Industrial Pharmacy I (Practical)** | Upon completion of this course the graduate is able to | |
| | C506P1 | Perform preformulation studies on drugs(a,b,c,e) |
| | C506P2 | Prepare and evaluate tablets by different methods(a,b,c,e) |
| | C506P3 | Formulate and evaluate capsules(a,b,c,e) |
| | C506P4 | Design and manufacture parenterals and ophthalmic preparations(a,b,c,e) |
| | C506P5 | Manufacture various cosmetics and creams(a,b,c,e) |
| **BP507P Pharmacology II (Practical)** | Upon completion of this course the graduate is able to | |
| | C507P1 | Learn the importance of physiological salt solutions and to identify the effect of various drugs on isolated frog heart, blood pressure and heart rate of dog.(a, d, i, j) |
| | C507P2 | Illustrate the diuretic activity of drugs in mice/rats(a, d, i, j) |
| | C507P3 | Identify the dose response relationship, effect of drugs on DRC and to construct the drug concentrations by various bioassay methods using animal simulator software.(a, d, i, j) |
| | C507P4 | Categorize the PA2 and PD2 value of drugs using rat anococcygeus muscle and guinea pig ileum(a, d, i, j) |
| | C507P5 | Predict various screening models for analgesic and anti-inflammatory activities(a, d, i, j) |
| **BP508P Pharmacognosy and Phytochemistry II (Practical)** | Upon completion of this course the graduate is able to | |
| | C508P1 | Analyze the morphological characters of crude drugs(a,k) |
| | C508P2 | Evaluate crude drugs by histological and powder analysis.(a,k) |
| | C508P3 | Identify the crude drugs by chemical tests(a,k) |
| | C508P4 | Experiment with isolation and detection of active principles from crude drugs.(a,k) |
| | C508P5 | Develop the chromatographic techniques for separation of phytoconstituents.(a,k) |
| **BP601T Medicinal Chemistry III (Theory)** | Upon completion of this course the graduate is able to | |
| | C601T1 | Recall the classification, mechanism of action, SAR, synthesis and therapeutic uses of narrow spectrum antibiotics ( a, c, d, f, k) |
| | C601T2 | Understand the classification, mechanism of action, SAR, synthesis and therapeutic uses of broad spectrum ( a, c, d, f, k) |
| | C601T3 | Understand the classification, mechanism of action, SAR, synthesis and therapeutic uses of Anti-tubercular, UTI and Anti-viral agents. ( a, c, d, f, k) |
| | C601T4 | Understand the classification, mechanism of action, SAR, synthesis and therapeutic uses of Anti-fungal, Anti-protozoal, Anthelmintic agents and sulphonamides. ( a, c, d, f, k) |
| | C601T5 | Enlist the different techniques of drug design and its importance ( a, c, d, f, k) |
| | Upon completion of this course the graduate is able to | |
| | C602T1 | List the drugs used in respiratory and gastrointestinal complications( a, c, d, i) |

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| **BP602T Pharmacology III (Theory)** | C602T2 | Understand the principles of chemotherapy and illustrate the mechanism of action of antibiotics( a, c, d, i) |
| | C602T3 | Explain and compare the mechanism of anti-mycobacterial, antifungal, anti-viral agents.( a, c, d, i) |
| | C602T4 | Analyze the chemotherapy of UTI's, STD's, anti-cancer drugs and to categorize the immunopharmacology( a, c, d, i) |
| | C602T5 | Assess the various types of toxicity studies, principles of treatment of poisoning and management of various poisoned conditions( a, c, d, i) |
| **BP603T Herbal Drug Technology (Theory)** | Upon completion of this course the graduate is able to | |
| | C603T1 | Define the terms like herb, herbal medicinal products raw materials, biodynamic agriculture and Indian system of medicine etc.( a, f, j) |
| | C603T2 | Identify the herbal drug and herbal food interactions along with importance of nutraceuticals( a, f, j) |
| | C603T3 | Categorize the herbal cosmetics, herbal excipients and herbal formulations( a, f, j) |
| | C603T4 | Explain the evaluation parameters of herbal drugs and to know the importance of patenting and regulatory issues( a, f, j) |
| | C603T5 | Elaborate about herbal industry and Goof Manufacturing Practices( a, f, j) |
| **BP604T Biopharmaceutics and Pharmacokinetics (Theory)** | Upon completion of this course the graduate is able to | |
| | C604T1 | Demonstrate the mechanisms of drug absorption through GIT and to explain the factors influencing the process of absorption and distribution(a,b,c,e) |
| | C604T2 | Categorize drug metabolism and metabolic pathways in renal excretion of drugs and make use of principles of bioavailability(a,b,c,e) |
| | C604T3 | Analyze the principles of pharmacokinetics and various compartment models. To distinguish various routes of administration in compartment modelling(a,b,c,e) |
| | C604T4 | Determine various rate constants using two compartment model by different routes of administration(a,b,c,e) |
| | C604T5 | Discuss factors causing non linearity and to explain methods for estimating parameters(a,b,c,e) |
| **BP605T Pharmaceutical Biotechnology (Theory)** | Upon completion of this course the graduate is able to | |
| | C605T1 | Select different techniques of Enzyme Immobilization, Biosensors and Protein Engineering in Pharmaceutical Industries.(a,f,h,i,l,k) |
| | C605T2 | Explain the Recombinant DNA Technology Tools and Products of Pharmaceutical Importance.(a,f,h,i,l,k) |
| | C605T3 | Apply the Concepts of Immunology in development of official Vaccines(a,f,h,i,l,k) |
| | C605T4 | Function the Concepts of Microbial Biotransformation and Mutations in Different Fields of Science(a,f,h,i,l,k) |
| | C605T5 | Choose and design Fermentor(s) for the Production of Secondary Metabolites(a,f,h,i,l,k) |
| | Upon completion of this course the graduate is able to | |
| | C606T1 | Know what are quality assurance and quality management concepts and ICH guidelines( a, c, d, k) |

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| **BP606T Quality Assurance (Theory)** | C606T2 | Know the outline of premises, personnel, plant layout, equipment and raw materials used in pharmaceutical industry( a, c, d, k) |
| | C606T3 | Develop complete knowledge regarding GLP and quality control tests for containers, closures etc( a, c, d, k) |
| | C606T4 | Know about the list records like batch formula records, SOP, etc and to evaluate the complaints raised against the products in pharmaceutical industries( a, c, d, k) |
| | C606T5 | Improve the knowledge regarding good ware housing practices and also calibration and validation of various equipments( a, c, d, k) |
| **BP607P Medicinal chemistry III (Practical)** | Upon completion of this course the graduate is able to | |
| | C607P1 | Prepare drugs and intermediates( a, c, d, f, k) |
| | C607P2 | Perform assay of different classes of drugs in products/formulations as per pharmacopoeial specifications( a, c, d, f, k) |
| | C607P3 | Prepare medicinally important compounds or intermediates by microwave irradiation technique( a, c, d, f, k) |
| | C607P4 | Draw structures and intermediates using CADD Tools |
| | C607P5 | Determine the physicochemical properities of drugs using drug design sotfwares |
| **BP608P Pharmacology III (Practical )** | Upon completion of this course the graduate is able to | |
| | C608P1 | Recall the dose calculations in pharmacological experiments, and to relate the antiallergic activity / anti-ulcer activity in rat models.( a, d, i, j) |
| | C608P2 | Demonstrate of effect of drugs on gastrointestinal motility and the effect of agonist/antagonists on guinea pig ileum( a, d, i, j) |
| | C608P3 | Construct serum biochemical parameters by using semi auto analyzer( a, d, i, j) |
| | C608P4 | Analyze effect of saline purgative on frog intestine, insulin hypoglycemic effect and test for pyrogens using rabbit method( a, d, i, j) |
| | C608P5 | Evaluate acute oral toxicity (LD50), acute skin irritation / corrosion and acute eye irritation / corrosion of a test substance( a, d, i, j) |
| **BP609P Herbal Drug Technology (Practical)** | Upon completion of this course the graduate is able to | |
| | C609P1 | Interpret the Phyto chemicals present in crude drugs.(b, c, d, e) |
| | C609P2 | Evaluate the excipients of natural origin(b, c, d, e) |
| | C609P3 | Formulate and evaluate a herbal formulations(b, c, d, e) |
| | C609P4 | Analyze the herbal monographs(b, c, d, e) |
| | C609P5 | Estimate the aldehyde, phenol and total alkaloid content and alcohol content of Ayurvedic formulations(b, c, d, e) |
| **BP701T** | Upon completion of this course the graduate is able to | |
| | C701T1 | Learn the principle, instrumentation and applications of UV spectrophotometer and Fluorimeter.( a, c, d,k) |
| | C701T2 | Acquire the knowledge regarding IR Spectroscopy, Flame Photometry, Atomic Absorption Spectroscopy, Nepheloturbidometry.( a, c, d,k) |

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| **Instrumental Methods of Analysis ( Theory)** | C701T3 | Identify a specific compound from mixture of compounds by performing TLC, Paper Chromatography, electrophoresis( a, c, d,k) |
| | C701T4 | Know the instrumentation and applications of HPLC, GC.( a, c, d,k) |
| | C701T5 | Study the principle, instrumentation and applications of Ion exchange chromatography, Gel Chromatography, Affinity chromatography.( a, c, d,k) |
| **BP702T Industrial Pharmacy II (Theory)** | Upon completion of this course the graduate is able to | |
| | C702T1 | Define pilot plant and tell the basic concepts of scale up considerations for various forms and show the SUPAC guidelines( a, b, k) |
| | C702T2 | Understand the term quality in technology development and transfer according to WHO guidelines and interpret with existing facilities. Outline the approved regulatory bodies and TT agencies in India and develop the TT related documentation and plan these to solve the practical aspects.( a, b, k) |
| | C702T3 | Apply the theories of regulatory affairs to gain knowledge. To list regulatory requirements for drug approval. Analyze the IND, NDA, Clinical research studies & FDA submissions. Take part in audition in industry( a, b, k) |
| | C702T4 | Justify how the quality management systems work to maintain quality. ( a, b, k) |
| | C702T5 | Elaborate the requirements of Indian regulatory requirements( a, b, k) |
| **BP703T Pharmacy Practice (Theory)** | Upon completion of this course the graduate is able to | |
| | C703T1 | Define and classify the Hospital, Hospital Pharmacy and Adverse Drug Reactions and to describe about community pharmacy.( a, g, i) |
| | C703T2 | Explain and illustrate about drug distribution system in a hospital, hospital formulary, therapeutic drug monitoring, medication adherence, Patient Medication History, Community pharmacy management.( a, g, i) |
| | C703T3 | Identify the role of pharmacy and therapeutic committee, drug information services, patient counselling. Education and training program in the hospital, Prescribed medication order and communication skill in public health services( a, g, i) |
| | C703T4 | Analyze the role of budget preparation, clinical pharmacy, over the counter sales in the field of pharmacy( a, g, i) |
| | C703T5 | Explain about the need of drug store management and inventory control, Investigational use of drugs and interpretation of Clinical Laboratory Tests( a, g, i) |
| **BP704T Novel Drug Delivery System (Theory)** | Upon completion of this course the graduate is able to | |
| | C704T1 | Recall the various approaches and polymers for development of controlled drug delivery systems( a , c, d, k ) |
| | C704T2 | Explain the formulation aspects of microencapsulation, mucosal and implantable drug delivery systems.( a , c, d, k ) |
| | C704T3 | Develop and evaluate transdermal, gastro retentive and naso pulmonary drug delivery systems.( a , c, d, k ) |

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| | C704T4 | Analyze the various approaches for formulation of targeted drug delivery systems.( a , c, d, k ) |
| | C704T5 | Evaluate the various approaches for the formulation of ocular and intrauterine drug delivery systems( a , c, d, k ) |
| **BP705P Instrumental Methods of Analysis ( Practical)** | Upon completion of this course the graduate is able to | |
| | C705P1 | Know how to estimate drugs by Colorimetry, U.V Spectrophotometry.( a, c ,d, k) |
| | C705P2 | Analyze the quenching effect of fluorescence( a, c ,d, k) |
| | C705P3 | Identify sodium, potassium by flame photometry to determine chlorides, sulphates by nephelo turbidimetry.( a, c ,d, k) |
| | C705P4 | Examine the separation of Amino acids, sugars, plant pigment by using Paper, column, TLC chromatographic techniques( a, c ,d, k) |
| | C705P5 | Demonstrate experiments on HPLC and GC ( a, c ,d, k) |
| **BP706PS Practice School** | Upon completion of this course the graduate is able to | |
| | C706PS1 | Interpret knowledge in identifying the scope of research.(a, b, c, d, h) |
| | C706PS2 | Apply theoretical principles to design experiments(a, b, c, d, h) |
| | C706PS3 | Illustrate various practical procedures.(a, b, c, d, h) |
| | C706PS4 | Differentiate the data available from various sources. (a, b, c, d, h) |
| | C706PS5 | Operate various instruments through hands on training by professional skills.(a, b, c, d, h) |
| **BP801T Biostatistics and Research Methodology (Theory)** | Upon completion of this course the graduate is able to | |
| | C801T1 | Describe basics of bio statistics, measures of central tendency , measures of dispersion and correlation.(a, c, i, k) |
| | C801T2 | Demonstrate the appropriate statistical methods required for a particular research design(a, c, i, k) |
| | C801T3 | Make use of various available parameters for testing hypothesis and learn how to utilize statistical software in research methodology(a, c, i, k) |
| | C801T4 | Understand various techniques of analysis of variance (ANOVA) including parametric and non-parametric(a, c, i, k) |
| | C801T5 | Explain about design and analysis of experiments(a, c, i, k) |
| **BP802T Social and Preventive Pharmacy (Theory)** | Upon completion of this course the graduate is able to | |
| | C802T1 | Define public health and list out about the factors effecting it.( e. f, i, j) |
| | C802T2 | Outline the principles on the prevention and control of communicable and non-communicable diseases.( e. f, i, j) |
| | C802T3 | Utilize National health programs its objectives, functioning and outcomes in a community.( e. f, i, j) |
| | C802T4 | List out the motives of various National Health Programs.( e. f, i, j) |
| | C801T5 | Compare the community services in rural, urban and school health.( e. f, i, j) |
| | Upon completion of this course the graduate is able to | |

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| **BP804ET Pharmaceutical Regulatory Science (Theory)** | C804ET1 | Recall the concepts of Drug discovery, development process, clinical studies and generic drug product development.( a, f, h, i, k) |
| | C804ET2 | Perceive the regulatory approval process and timelines for IND, NDA and ANDA and to know about changes to an approved NDA/ANDA( a, f, h, i, k) |
| | C804ET3 | Familiar with Regulatory authorities and agencies like India, USA, Europe, Australia, Japan and Canada and to understand the concepts of Regulatory science in pharmaceutical industry as well as to make use of regulatory guidelines, laws, acts, orange and purple book( a, f, h, i, k) |
| | C804ET4 | Know the regulatory registration process of Indian drugs in overseas market which include to understand about technical documents like DMF, CTD, eCTD and ACTD( a, f, h, i, k) |
| | C804ET5 | Assimilate the process of clinical trials and pharmacovigilance as well as to understand obligations of GCP in clinical trials( a, f, h, i, k) |
| **BP811ET Advanced Instrumentation Techniques (Theory)** | Upon completion of this course the graduate is able to | |
| | C811ET1 | Recall the principle and instrumentation of NMR spectroscopy(a,c,d, k) |
| | C811ET2 | Illustrate the ionization and analyzers in mass spectrometry(a,c,d, k) |
| | C811ET3 | Explain principle, instrumentation and applications of X-RD(a,c,d, k) |
| | C811ET4 | Know the importance and procedure for radioimmunoassay and extraction techniques(a,c,d, k) |
| | C811ET5 | Maximize the knowledge of hyphenated techniques(a,c,d, k) |
| **Project Work** | Upon completion of this course the graduate is able to | |
| | PW1 | Organize literature review and integrate the objective of the research work( a, b, c, d, e, g, h, i) |
| | PW2 | Attribute resources required to perform the research.( a, b, c, d, e, g, h, i) |
| | PW3 | Implement the concepts of experimental procedures.( a, b, c, d, e, g, h, i) |
| | PW4 | Illustrate the experimental data by statistical analysis.( a, b, c, d, e, g, h, i) |
| | PW5 | Report the findings of the research work.( a, b, c, d, e, g, h, i) |