

**Course Outcome B. Pharm (PCI) Syllabus**

Course code /Course title	Course outcomes
<b>First Year B. Pharm (Semester-I)</b>	
<b>BP101T</b> <b>Human Anatomy and Physiology-I</b>	Upon completion of this course the student should be able to, <b>CO1:</b> Explain the gross morphology, structure and function of various organs of the human body. <b>CO2:</b> Describe the various homeostatic mechanisms and their imbalances. <b>CO3:</b> Identify the various tissues and organs of different systems of human body. <b>CO4:</b> Perform the various experiments related to special senses and nervous system.
<b>BP102T</b> <b>Pharmaceutical Analysis I</b>	Upon completion of this course the student should be able to, <b>CO1:</b> understand the principles, importance, and role of volumetric and electro-chemical analysis. <b>CO2:</b> carryout various volumetric and electro-chemical titrations. <b>CO3:</b> Understand types of errors and their trouble shutting. <b>CO4:</b> Understand analytical instrumental handling skills. <b>CO5:</b> Design the various analytical experiments and write reports on it by using pharmacopeias.
<b>BP103T</b> <b>Pharmaceutics I</b>	Upon completion of this course the student should be able to, <b>CO1:</b> Will Know about the history of profession of pharmacy. <b>CO2:</b> Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations. <b>CO3:</b> Understand the professional way of handling the prescription. <b>CO4:</b> Preparation of various conventional dosage forms.
<b>BP104T</b> <b>Pharmaceutical Inorganic Chemistry</b>	Upon completion of this course the student should be able to, <b>CO1:</b> Describe the sources of impurities and methods for determine the impurities in inorganic drugs and pharmaceuticals.

	<p><b>CO2:</b> Explain the Functions of major physiological ions, Electrolytes used in the replacement therapy, buffer equations and buffer capacity in general, role of fluoride in the treatment of dental caries.</p> <p><b>CO3:</b> Explain the gastrointestinal agents like Acidifiers, Antacid, Cathartics and Antimicrobials</p> <p><b>CO4:</b> To know Miscellaneous compounds like Expectorants, Emetics, Haematinics and Astringents</p> <p><b>CO5:</b> Understand use of various radiopharmaceuticals.</p>
<p><b>BP105T</b> <b>Communication skills</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand the behavioral needs for a pharmacist to function effectively in the areas of pharmaceutical operation.</p> <p><b>CO2:</b> Understand the basic writing and listening skills.</p> <p><b>CO3:</b> Understand interview and presentation skills.</p> <p><b>CO4: CO5:</b> Will know about dos and don'ts of group discussion.</p>
<p><b>BP106RBT</b> <b>Remedial Biology</b></p>	<p>Upon completion of the course, the student shall be able to</p> <p><b>CO1:</b> know the classification and salient features of five kingdoms of life</p> <p><b>CO2:</b> understand the basic components of anatomy &amp; physiology of plant</p> <p><b>CO3:</b> know understand the basic components of anatomy &amp; physiology animal with special reference to human</p>
<p><b>BP106RMT</b> <b>Remedial Mathematics</b></p>	<p>Upon completion of the course the student shall be able to:-</p> <p><b>CO1:</b> Know the theory and their application in Pharmacy</p> <p><b>CO2:</b> Solve the different types of problems by applying theory</p> <p><b>CO3:</b> Appreciate the important application of mathematics in Pharmacy</p>
<p><b>BP107P</b> <b>Human Anatomy and Physiology-I</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> To identify the various tissues and organs of different systems of human body.</p>

	<p><b>CO2:</b> To perform the hematological test like blood cell counts, haemoglobin estimation, bleeding/clotting time etc. and also to record blood pressure, heart rate, pulse and respiratory volume.</p> <p><b>CO3:</b> To describe the various homeostatic mechanisms and their imbalances.</p> <p><b>CO4:</b> To study the maintenance of normal functioning of human body.</p>
<p><b>BP108P</b> <b>Pharmaceutical Analysis- I</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Perform limit test of chloride, Sulphate, Iron, Arsenic.</p> <p><b>CO2:</b> Prepare and standardize Sodium hydroxide, Sulphuric acid, Sodium thiosulfate, Potassium permanganate, ceric ammonium sulphate.</p> <p><b>CO3:</b> Perform various assays of the compounds along with standardization of titrant and determination of normality</p> <p><b>CO4:</b> Understand the concepts of volumetric and electrochemical analysis.</p> <p><b>CO5:</b> Design and execute analytical experiment according to various pharmacopeias.</p>
<p><b>BP109P</b> <b>Pharmaceutics I</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand formulation and evaluation of pharmaceutical solution.</p> <p><b>CO2:</b> Understand formulation and evaluation of pharmaceutical dispersed system.</p> <p><b>CO3:</b> Understand formulation and evaluation of pharmaceutical powders.</p> <p><b>CO4:</b> Understand formulation and evaluation of semisolid dosage form.</p>
<p><b>BP110P</b> <b>Pharmaceutical Inorganic Chemistry</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Perform Limit tests for certain impurities like ions, Chlorides and Sulphates, Heavy metals, lead and Arsenic as per</p>

	<p>Indian pharmacopeia.</p> <p><b>CO2:</b> Identify inorganic compound through various chemical test.</p> <p><b>CO3:</b> Test for purity through swelling power of Bentonite.</p> <p><b>CO4:</b> Preparation of inorganic pharmaceuticals through Boric acid and Potash alum.</p>
<p><b>BP111P</b> <b>Communication skills</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand the essential communication skills.</p> <p><b>CO2:</b> Learn and practice different types of pronunciation.</p> <p><b>CO3:</b> Learn to apply advanced communication skills.</p> <p><b>CO4:</b> Know the writing skills and presentation skills.</p>
<p><b>BP112RBP</b> <b>Remedial Biology</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand and mechanism of Introduction to experiments in biology</p> <p><b>CO2:</b> Able to understand cell, stem, root, leaf, seed, fruit, and flower.</p> <p><b>CO3:</b> Able to understand the Microscopic study and identification of tissues pertinent</p> <p><b>CO4:</b> Able to understand the Identification of bones, blood group, blood pressure, tidal volume.</p>

**First Year B. Pharm (Semester-II)**

<p><b>BP201T</b> <b>Human Anatomy and Physiology II</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Explain the gross morphology, structure and function of various organs of the human body.</p> <p><b>CO2:</b> Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body.</p> <p><b>CO3:</b> Identify the various tissues and organs of different systems of human body.</p> <p><b>CO4:</b> Perform the hematological tests like blood cell counts, haemoglobin estimation, bleeding/clotting time etc and also record</p>
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	blood pressure, heart rate, pulse and respiratory volume.
<b>BP202T</b> <b>Pharmaceutical Organic</b> <b>Chemistry-I</b>	Upon completion of this course the student should be able to, <b>CO1:</b> Understand the structure, name and the type of isomerism of the organic compounds. <b>CO2:</b> Understand the name reaction, synthesis and orientation of various classes of reactions. <b>CO3:</b> Will know about the reactivity/stability of compounds. <b>CO4:</b> Identify the organic compound by systematic qualitative test.
<b>BP203T</b> <b>Biochemistry</b>	Upon completion of this course the student should be able to, <b>CO1:</b> Classify / explain the chemical nature, biological role of bio- molecules and identify the concepts of bioenergetics. <b>CO2:</b> Understand the metabolic pathways of bio-molecules in physiological and pathological conditions. <b>CO3:</b> Explain biological significance & disorders of bio-molecules. <b>CO4:</b> Outline the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins <b>CO5:</b> Understand the biosynthesis of nucleotides and nucleoside.
<b>BP204T</b> <b>Pathophysiology</b>	Upon completion of this course the student should be able to, <b>CO1:</b> Understand the etiology and pathogenesis of the various diseases. <b>CO2:</b> Will know about the name the signs and symptoms of the various diseases. <b>CO3:</b> Identify the mode of infection of the various diseases. <b>CO4:</b> Identify the complications of the diseases.
<b>BP205T</b> <b>Computer Applications in</b> <b>Pharmacy</b>	Upon completion of this course the student should be able to, <b>CO1:</b> To understand different types of databases, applications of computers and databases in pharmacy. <b>CO2:</b> To illustrate the concept of number system in computers.

	<p><b>CO3:</b> To make use of web technologies such as HTML, XML, CSS, programming languages, Web servers and pharmacy drug database.</p> <p><b>CO4:</b> To explain about bioinformatics and its impact in vaccine discovery</p>
<p><b>BP206T</b> <b>Environmental sciences</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> To know Multidisciplinary nature of environmental studies.</p> <p><b>CO2:</b> Understand Concept, Structure and function of an ecosystem.</p> <p><b>CO3:</b> Explain environmental Pollution and their types.</p> <p><b>CO4:</b> Identify the natural resources and related problems of renewable and non-renewable resources.</p>
<p><b>BP207P</b> <b>Human Anatomy and Physiology II</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> To identify the various tissues and organs of different systems of human body.</p> <p><b>CO2:</b> To perform the hematological test like blood cell counts, haemoglobin estimation, bleeding/clotting time etc. and also to record blood pressure, heart rate, pulse and respiratory volume.</p> <p><b>CO3:</b> To describe the various homeostatic mechanisms and their imbalances.</p> <p><b>CO4:</b> To study the maintenance of normal functioning of human body.</p>
<p><b>BP208P Pharmaceutical Organic Chemistry I</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Acquire knowledge of systematic qualitative analysis of unknown organic compounds.</p> <p><b>CO2:</b> Acquire knowledge, in identification of the unknown compound from the literature using melting point/ boiling point.</p> <p><b>CO3:</b> Learn and understand the method of preparation of suitable solid derivatives from reactants.</p> <p><b>CO4:</b> To construct molecular structure by using atomic models</p>

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<b>BP209P</b> <b>Biochemistry</b>	Upon completion of this course the student should be able to, <b>CO1:</b> Understand the qualitative analysis of carbohydrate and protein. <b>CO2:</b> Understand the qualitative analysis of abnormal constituents of urine. <b>CO3:</b> Will Know about the determination of blood creatinine, sugar, and cholesterol. <b>CO4:</b> Understand the determination of enzymatic hydrolysis and salivary amylase Activity.
<b>BP210P</b> <b>Computer Applications in Pharmacy</b>	Upon completion of this course the student should be able to, <b>CO1:</b> To design a questionnaire and use various tools in MS word. <b>CO2:</b> To retrieve drug information and its adverse effect. <b>CO3:</b> To make use of web technologies such as HTML, XML, CSS, programming languages, Web servers and pharmacy drug database. <b>CO4:</b> To know the various tools used in MS Access.

**Second Year B. Pharm (Semester-III)**

<b>BP301T</b> <b>Pharmaceutical Organic Chemistry II</b>	Upon completion of this course the student should be able to, <b>CO1:</b> Understand the concept of aromaticity and resonance, in case of benzene, phenol, amine, amide and carboxylic acid. <b>CO2:</b> Understand the structure, name, methods of synthesis, reactions and orientation of reactions. <b>CO3:</b> Understand the synthesis and application of different organic compound including cycloalkanes, polynuclear hydrocarbons, phenanthrene, anthracene and naphthalene and its derivatives. <b>CO4:</b> Will know about theories involve in cyclo alkane.
<b>BP302T</b>	Upon completion of this course the student should be able to,

<b>Physical Pharmaceutics I</b>	<p><b>CO1:</b> Understand solubility expressions, mechanism of solute solvent interaction.</p> <p><b>CO2:</b> Explain various states of matter, physicochemical properties of drug molecule applicable in designing of dosage form.</p> <p><b>CO3:</b> Understand the concept of surface tension and interfacial tension phenomenon.</p> <p><b>CO4:</b> Understand application of buffer, buffer capacity and buffer in pharmaceutical and biological system.</p> <p><b>CO5:</b> Will know about the process of complexation.</p>
<b>BP303T Pharmaceutical Microbiology</b>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand methods of isolation, cultivation and preservation of various microorganisms.</p> <p><b>CO2:</b> To understand the importance and implementation of sterilization principles/methods in pharmaceutical industry.</p> <p><b>CO3:</b> Learn sterility testing of pharmaceutical products.</p> <p><b>CO4:</b> Carried out microbiological assay standardization of Pharmaceuticals.</p>
<b>BP304T Pharmaceutical Engineering</b>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Will know about the various unit operations used in Pharmaceutical industries.</p> <p><b>CO2:</b> Understand the material handling techniques.</p> <p><b>CO3:</b> Perform the various processes involved in pharmaceutical manufacturing process.</p> <p><b>CO4:</b> Understand the theories of corrosion and their types.</p> <p><b>CO5:</b> Understand significance of plant lay out design for optimum use of resources.</p>
<b>BP305P Pharmaceutical Organic Chemistry II</b>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Identify the chemical impurities and its purification methods</p> <p><b>CO2:</b> Calculate the analytical constants values of oils.</p>



	<p><b>CO3:</b> Understand the synthesis of drugs and intermediate.</p> <p><b>CO4:</b> Understand the principles and reaction orientation of synthesized drugs and intermediate.</p>
<p><b>BP306P</b> <b>Physical Pharmaceutics I</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Determine the various physicochemical properties of drug molecules which are applicable in the designing of dosage form.</p> <p><b>CO2:</b> Analyze HLB number of a surfactant by Saponification method.</p> <p><b>CO3:</b> Compare different method used in determination of physicochemical parameter.</p> <p><b>CO4:</b> Determine the partition co- efficient of drugs.</p>
<p><b>BP307P</b> <b>Pharmaceutical Microbiology</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand equipment used and important in sterilization.</p> <p><b>CO2:</b> Capable of performing microorganism staining techniques.</p> <p><b>CO3:</b> perform the microbial assay.</p> <p><b>CO4:</b> To understand isolation of microbial culture.</p>
<p><b>BP308P</b> <b>Pharmaceutical Engineering</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Perform the various unit operation processes.</p> <p><b>CO2:</b> Understand the material handling techniques in pharmaceutics laboratory.</p> <p><b>CO3:</b> Explain the construction, working and application of Pharmaceutical Machinery.</p> <p><b>CO4:</b> Understand the process of size reduction.</p>

**Second Year B. Pharm (Semester-IV)**

<p><b>BP401T</b> <b>Pharmaceutical Organic Chemistry III</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand the methods of preparation and properties of organic compounds.</p> <p><b>CO2:</b> Explain the stereo chemistry aspects of organic compounds and stereo chemical reactions</p>
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	<p><b>CO3:</b> Understand the structure, name, properties, reaction and mechanism of reactions of heterocyclic compounds.</p> <p><b>CO4:</b> Will know about the medicinal uses and other applications of organic compounds.</p>
<p><b>BP402T</b> <b>Medicinal Chemistry-I</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> understand the chemistry of drugs with respect to their pharmacological activity.</p> <p><b>CO2:</b> understand the drug metabolic pathways, adverse effect and therapeutic value of drugs.</p> <p><b>CO3:</b> Will know about the Structural Activity Relationship (SAR) of different classes of drugs.</p> <p><b>CO4:</b> Outline the synthesis of prescribed drugs.</p>
<p><b>BP403T</b> <b>Physical Pharmaceutics II</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand colloidal dispersion and their size, shapes general characteristics, properties and evaluation.</p> <p><b>CO2:</b> Will know about the concept of rheology, deformation of solids, micromeritics and its application in pharmaceutical industries.</p> <p><b>CO3:</b> Understand the coarse dispersion and their properties.</p> <p><b>CO4:</b> Understand methods for determining particle size and its applications.</p> <p><b>CO5:</b> Know the principles of chemical kinetics &amp; to use them for stability testing and determination of expiry date of formulations.</p>
<p><b>BP404T</b> <b>Pharmacology -I</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Explain fundamental concept used in pharmacology like synergism, agonist, antagonist, side effect, and adverse effects.</p> <p><b>CO2:</b> Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.</p> <p><b>CO3:</b> Understand the pharmacological actions of different categories of drugs.</p>

	<p><b>CO4:</b> Discuss the mechanism of drug acting on peripheral nervous system.</p> <p><b>CO5:</b> Explain various drugs used for the drug acting on central nervous system.</p>
<p><b>BP405T</b> <b>Pharmacognosy and</b> <b>Phytochemistry I</b></p>	<p>Upon completion of the course, the student should be able to,</p> <p><b>CO1:</b> To know the techniques in the cultivation and production of crude drugs.</p> <p><b>CO2:</b> to know the crude drugs, their uses and chemical nature</p> <p><b>CO3:</b> know the evaluation techniques for the herbal drugs</p> <p><b>CO4:</b> to carry out the microscopic and morphological evaluation of crude drugs</p>
<p><b>BP406P</b> <b>Medicinal Chemistry -I</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Able to outline the procedure, principle, mechanism and synthesis of drugs and their intermediate.</p> <p><b>CO2:</b> Capable to describe the method for crystallization and characterization of drugs and intermediate.</p> <p><b>CO3:</b> perform the assay of drugs and their preparation by pharmacopoeial method.</p> <p><b>CO4:</b> understand to determine the partition coefficient of drugs.</p>
<p><b>BP407P</b> <b>Physical Pharmaceutics II</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand various particle size, particle size distribution, flow properties of powders using various methods.</p> <p><b>CO2:</b> Determine the sedimentation volume and viscosity of the liquids by various methods.</p> <p><b>CO3:</b> Will know about the different instruments handling techniques.</p> <p><b>CO4:</b> Understand the different methods of reaction rate constant and carry out the stability studies.</p>
<p><b>BP408P</b> <b>Pharmacology -I</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Handle the laboratory equipments and apply techniques</p>

	<p>used in experimental pharmacology</p> <p><b>CO2:</b> Demonstrate the common laboratory techniques like routes of administration, blood withdrawal for animal studies</p> <p><b>CO3:</b> Observe the effect of drugs on animals by simulated experiments.</p> <p><b>CO4:</b> Evaluate the pharmacological screening of drugs in rats/mice</p>
<p><b>BP409P</b></p> <p><b>Pharmacognosy and Phytochemistry I</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Determine the microscopical index/number/values of crude drugs.</p> <p><b>CO2:</b> Analysis of crude drugs by different chemical tests.</p> <p><b>CO3:</b> Able to perform and understand the evaluation parameter for standardization of crude drug.</p> <p><b>CO4:</b> Determine the extractive values and moisture content of crude drugs.</p>

**Third Year B. Pharm (Semester-V)**

<p><b>BP501T</b></p> <p><b>Medicinal Chemistry-II</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand the chemistry of drugs with respect to their pharmacological action.</p> <p><b>CO2:</b> Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs.</p> <p><b>CO3:</b> Will Know about the Structural Activity Relationship of different class of drugs.</p> <p><b>CO4:</b> Outline the synthesis of prescribed drugs.</p>
<p><b>BP502T</b></p> <p><b>Industrial Pharmacy-I</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Will know about the various pharmaceutical dosage forms and their manufacturing techniques.</p> <p><b>CO2:</b> Understand the formulation, coating and evaluation of tablet /capsule dosage form.</p>

	<p><b>CO3:</b> Understand the formulation and evaluation of Semi solid dosage form.</p> <p><b>CO4:</b> Understand the formulation and evaluation of parenteral products.</p>
<p><b>BP503T</b> <b>Pharmacology-II</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand the mechanism of drug action and its relevance in the treatment of different diseases and hemodynamic and electrophysiology of heart.</p> <p><b>CO2:</b> Understand the different mechanism of drug action.</p> <p><b>CO3:</b> Identify the role of autacoids and related drugs.</p> <p><b>CO4:</b> Explain pharmacology of drugs acting on endocrine system.</p> <p><b>CO5:</b> Understand principles of bioassay and methods of application for various.</p>
<p><b>BP504T</b> <b>Pharmacognosy and Phytochemistry-II</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Will know about the modern extraction techniques, characterization and identification of the herbal drugs or phytoconstituents.</p> <p><b>CO2:</b> Understand the preparation and evaluation of herbal formulation.</p> <p><b>CO3:</b> Understand the herbal drug interactions.</p> <p><b>CO4:</b> Carryout isolation and identification of phytoconstituents.</p>
<p><b>BP505T</b> <b>Pharmaceutical Jurisprudence</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Acquire knowledge on schedule rules, regulations and laws related to Drugs and Cosmetics Act, 1940 and its rules 1945.</p> <p><b>CO2:</b> Understand the study of Schedule G, H, M, N, P, T, U, V, X, Y and General labeling requirements and specimen labels for drugs and cosmetics.</p> <p><b>CO3:</b> Explain the various acts on Pharmacy Act and Medicinal and Toilet Preparation Act etc.</p> <p><b>CO4:</b> Understand another act and rules associated with Drugs and</p>

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	Magic Remedies Act and its rules and National Pharmaceutical Pricing Authority. <b>CO5:</b> Will know about the various Pharmaceutical Legislations, Code of Pharmaceutical ethics and Introduction to Intellectual Property Rights (IPR).
<b>BP506P</b> <b>Industrial Pharmacy-I</b>	Upon completion of this course the student should be able to, <b>CO1:</b> Understand the preformulation studies of paracetamol. <b>CO2:</b> Design formulation of Aspirin tablet. <b>CO3:</b> Understand the evaluation parameter of marketed tablet. <b>CO4:</b> Understand the evaluation for glass containers.
<b>BP507P</b> <b>Pharmacology-II</b>	Upon completion of this course the student should be able to, <b>CO1:</b> Understand the concept of <i>in-Vitro</i> Pharmacology. <b>CO2:</b> Demonstrate the effect of drugs on animals by simulated experiments. <b>CO3:</b> Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments. <b>CO4:</b> Determination of drug concentration by bioassay.
<b>BP508P</b> <b>Pharmacognosy and Phytochemistry-II</b>	Upon completion of this course the student should be able to, <b>CO1:</b> Understand morphological, microscopical and powder characteristics of crude drug sample. <b>CO2:</b> Understand and perform the isolation process of phytoconstituents. <b>CO3:</b> Perform different methods of Chromatography. <b>CO4:</b> Performs chemical test of crude drugs.

**Third Year B. Pharm (Semester-VI)**

<b>BP601T</b> <b>Medicinal Chemistry III</b>	Upon completion of this course the student should be able to, <b>CO1:</b> Understand the Structure activity relationship of different classes of drugs. <b>CO2:</b> Understand the chemistry, metabolic pathway and mechanism
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	<p>of action of different classes of drugs.</p> <p><b>CO3:</b> Know the prodrug design, adverse effects and therapeutic value of drugs.</p> <p><b>CO4:</b> Know the drug design techniques by QSAR application.</p>
<p><b>BP602T</b> <b>Pharmacology III</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand the pharmacology of drug acting on respiratory system.</p> <p><b>CO2:</b> Understand the general principles of chemotherapy of different drugs.</p> <p><b>CO3:</b> Explain the chemotherapy of different drugs like antitubercular agents and antileprotic agents.</p> <p><b>CO4:</b> understand the principles of toxicology and treatment of various poisonings.</p>
<p><b>BP603T</b> <b>Herbal Drug Technology</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand raw material as source of herbal drugs from cultivation to herbal drug Product.</p> <p><b>CO2:</b> Will know about the WHO and ICH guidelines for evaluation of herbal drugs.</p> <p><b>CO3:</b> Will know about the herbal cosmetics, natural sweeteners, and neutraceuticals.</p> <p><b>CO4:</b> understand the patenting of herbal drugs, GMP.</p>
<p><b>BP604T</b> <b>Biopharmaceutics and Pharmacokinetics</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand the basic concepts in Biopharmaceutics and pharmacokinetics and their significance.</p> <p><b>CO2:</b> Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination.</p> <p><b>CO3:</b> To understand the concepts of bioavailability and bioequivalence of drug products and their significance.</p> <p><b>CO4:</b> Understand various pharmacokinetic parameters, their</p>

	significance & applications.
<p><b>BP605T</b> <b>Pharmaceutical</b> <b>Biotechnology</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand the importance of immobilization of enzymes in pharmaceutical industries.</p> <p><b>CO2:</b> Understand the genetic engineering applications in relation to production of pharmaceuticals.</p> <p><b>CO3:</b> Understand the importance of monoclonal antibodies in industries.</p> <p><b>CO4:</b> Understand the use of microorganisms in fermentation technology.</p>
<p><b>BP606T</b> <b>Quality Assurance</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand the cGMP aspects in a pharmaceutical industry.</p> <p><b>CO2:</b> Understand the importance of documentation.</p> <p><b>CO3:</b> Understand the scope of quality certifications applicable to pharmaceutical industries.</p> <p><b>CO4:</b> Will know about the responsibilities of QA &amp; QC departments.</p>
<p><b>BP607P</b> <b>Medicinal chemistry III</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand the synthesis drugs and intermediate.</p> <p><b>CO2:</b> Analyze percentage purity of pharmaceutical drugs.</p> <p><b>CO3:</b> Understand the synthesis by microwave irradiation technique.</p> <p><b>CO4:</b> To compute Lipinski's rule of five and sketch/draw chemical compound.</p>
<p><b>BP608P</b> <b>Pharmacology III</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Perform dose calculation in pharmacological experiments.</p> <p><b>CO2:</b> Understand the concept of <i>in-Vivo</i> Pharmacology</p> <p><b>CO3:</b> Demonstrate the effect of drugs on animals by simulated experiments</p> <p><b>CO4:</b> Study bio statistical methods in experimental pharmacology</p>



	and calculation of pharmacokinetic parameters.
<b>BP609P Herbal Drug Technology</b>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Perform preliminary phytochemical screening of crude drugs and evaluations of excipients.</p> <p><b>CO2:</b> Preparation and evaluations of formulations of drugs.</p> <p><b>CO3:</b> Analysis of herbal drugs from recent Pharmacopoeias.</p> <p><b>CO4:</b> Determine the phenol content, aldehyde content etc</p>

**Final Year B. Pharm (Semester-VII)**

<b>BP701T Instrumental Methods of Analysis</b>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand the interaction of spectrophotometric techniques and its applications in drug analysis.</p> <p><b>CO2:</b> Understand the chromatographic separation and analysis of drugs.</p> <p><b>CO3:</b> Perform quantitative &amp; qualitative analysis of drugs.</p> <p><b>CO4:</b> Understand the analytical instrumental handling.</p> <p><b>CO5:</b> Explain the construction, working and applications of analytical instrument.</p>
<b>BP702T Industrial Pharmacy-II</b>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Will Know about the process of pilot plant and scale up of pharmaceutical dosage forms.</p> <p><b>CO2:</b> Understand the process of technology transfer from lab scale to commercial batch.</p> <p><b>CO3:</b> Will Know about the different Laws and Acts that regulate pharmaceutical industry.</p> <p><b>CO4:</b> Understand the approval process and regulatory requirements for drug products.</p>
<b>BP703T Pharmacy Practice</b>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Will know about the hospital and its organization.</p> <p><b>CO2:</b> Understand the various drug distribution processes.</p>

	<p><b>CO3:</b> Will know about the pharmacy and therapeutic committee and role of pharmacist in the education and training program.</p> <p><b>CO4:</b> Understand the concept of clinical pharmacy and importance of over the counter (OTC) drugs.</p> <p><b>CO5:</b> Understand the investigational/new use of drugs.</p>
<p><b>BP704T</b> <b>Novel Drug Delivery System</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand the various approaches for development of novel drug delivery system.</p> <p><b>CO2:</b> Understand about the criteria for selection of drug and polymer for microencapsulation.</p> <p><b>CO3:</b> Understand about the criteria for selection of drug and polymer gastroretentive drug delivery systems.</p> <p><b>CO4:</b> Will Know about the various polymer uses transdermal drug delivery systems.</p>
<p><b>BP705P</b> <b>Instrumental Methods of Analysis</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Perform absorption maxima and effect of solvents on absorption maxima of organic compounds.</p> <p><b>CO2:</b> Understand the various assays by using spectrophotometric techniques.</p> <p><b>CO3:</b> Demonstrate the experiment on chromatographic techniques.</p> <p><b>CO4:</b> Explain and perform analytical experiments.</p>
<p><b>BP706PS</b> <b>Practice School</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Select the topic according to their area of interest.</p> <p><b>CO2:</b> Will know about the subject literature which is useful to design their project work.</p> <p><b>CO3:</b> Evaluate conclusions on their research problem.</p> <p><b>CO4:</b> Explain a project report and defend his / her work in front of a panel of examiners.</p>

<b>Final Year B. Pharm (Semester-VIII)</b>	
<p><b>BP801T</b> <b>Biostatistics and Research Methodology</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand the concept of biostatistics in pharmacy, measures of central tendency, dispersion and correlation.</p> <p><b>CO2:</b> Will know about the regression, probability, SEM and various parametric tests.</p> <p><b>CO3:</b> Understand the concept of non parametric test and research methodology.</p> <p><b>CO4:</b> Understand the operation of M.S. Excel, SPSS, R, MINITAB®, and DoE (Design of Experiment).</p> <p><b>CO5:</b> Apply the statistical techniques in solving the problems and understand the concept of factorial design.</p>
<p><b>BP802T</b> <b>Social and Preventive Pharmacy</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide.</p> <p><b>CO2:</b> Will know about the current healthcare development system for various diseases.</p> <p><b>CO3:</b> Understand the various health programs conducted by Govt. of India.</p> <p><b>CO4:</b> Understand various health policies given by Govt. of India.</p> <p><b>CO5:</b> Will know about preventative measures of various diseases.</p>
<p><b>BP803ET</b> <b>Pharma Marketing Management</b></p>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Understand the various strategies in pharmaceutical market.</p> <p><b>CO2:</b> Will know about the Classification, product line and product decisions.</p> <p><b>CO3:</b> Understand the different online promotional techniques for OTC products.</p> <p><b>CO4:</b> Learn the duties for professional sales representative</p> <p><b>CO5:</b> Understand the meaning, importance, objective of pricing</p>



PRESIDENT

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FOUNDER PRESIDENT

Late. Dr. Dileep More

	and overview of DPCO and NPPA.
<b>BP811ET Advanced Instrumentation Techniques</b>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> understand the advanced instruments used and its applications in drug analysis</p> <p><b>CO2:</b> understand the chromatographic separation and analysis of drugs.</p> <p><b>CO3:</b> understand the calibration of various analytical instruments</p> <p><b>CO4:</b> Will know about the analysis of drugs using various analytical instruments.</p>
<b>BP813 Project Work</b>	<p>Upon completion of this course the student should be able to,</p> <p><b>CO1:</b> Will know about their topic for a research design including the sampling, observational, statistical and operational designs if any.</p> <p><b>CO2:</b> Will know about the subject literature which is useful to design their research /review work.</p> <p><b>CO3:</b> Evaluate conclusions on their research problem.</p> <p><b>CO4:</b> Calculate the relevant data, interpret &amp; analyze it from observation and results wherever applicable.</p> <p><b>CO5:</b> Explain a rational project report and defend his / her work in front of a panel of examiners.</p>