Course Outcome B. Pharm (PCI) Syllabus

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

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

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

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

First Year B. Pharm (Semester-II)	
BP201T **Human Anatomy and Physiology II**	Upon completion of this course the student should be able to, **CO1:** Explain the gross morphology, structure and function of various organs of the human body. **CO2:** Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body. **CO3:** Identify the various tissues and organs of different systems of human body. **CO4:** Perform the hematological tests like blood cell counts, haemoglobin estimation, bleeding/clotting time etc and also record

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	blood pressure, heart rate, pulse and respiratory volume.
BP202T Pharmaceutical Organic Chemistry-I	Upon completion of this course the student should be able to, **CO1:** Understand the structure, name and the type of isomerism of the organic compounds. **CO2:** Understand the name reaction, synthesis and orientation of various classes of reactions. **CO3:** Will know about the reactivity/stability of compounds. **CO4:** Identify the organic compound by systematic qualitative test.
BP203T Biochemistry	Upon completion of this course the student should be able to, **CO1:** Classify / explain the chemical nature, biological role of bio- molecules and identify the concepts of bioenergetics. **CO2:** Understand the metabolic pathways of bio-molecules in physiological and pathological conditions. **CO3:** Explain biological significance & disorders of bio-molecules. **CO4:** Outline the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins **CO5:** Understand the biosynthesis of nucleotides and nucleoside.
BP204T Pathophysiology	Upon completion of this course the student should be able to, **CO1:** Understand the etiology and pathogenesis of the various diseases. **CO2:** Will know about the name the signs and symptoms of the various diseases. **CO3:** Identify the mode of infection of the various diseases. **CO4:** Identify the complications of the diseases.
BP205T Computer Applications in Pharmacy	Upon completion of this course the student should be able to, **CO1:** To understand different types of databases, applications of computers and databases in pharmacy. **CO2:** To illustrate the concept of number system in computers.

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

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

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

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

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

Second Year B. Pharm (Semester-IV)	
BP401T **Pharmaceutical Organic Chemistry III**	Upon completion of this course the student should be able to, **CO1:** Understand the methods of preparation and properties of organic compounds. **CO2:** Explain the stereo chemistry aspects of organic compounds and stereo chemical reactions

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

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

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

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

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

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

Third Year B. Pharm (Semester-VI)	
BP601T **Medicinal Chemistry III**	Upon completion of this course the student should be able to, **CO1:** Understand the Structure activity relationship of different classes of drugs. **CO2:** Understand the chemistry, metabolic pathway and mechanism

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

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

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

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

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

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

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

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