

## B.PHARM COURSE OUTCOME

Sl.No	Subject code	Subject	Course outcomes
<b>I SEMESTER</b>			
1.	BP101T	HUMAN ANATOMY AND PHYSIOLOGY-I THEORY	<p>After the successful completion of the course, students should be able to</p> <ol style="list-style-type: none"> <li>1. Explain the gross morphology, structure and functions of various organs of the human body.</li> <li>2. Describe the various homeostatic mechanisms and their imbalances.</li> <li>3. Identify the structure and functions of various tissues and organs of different systems of human body.</li> <li>4. To understand the physiological mechanism relate to various diseases.</li> </ol>
	BP107P	HUMAN ANATOMY AND PHYSIOLOGY-I PRACTICAL	<p>After the successful completion of the course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the processes involved in maintaining homeostasis and anticipate what might happen if homeostatic balance mechanisms fail.</li> <li>2. Identify the tissues, organs and understand their interrelationship.</li> <li>3. Perform various biochemical tests, analyse Anatomical and Physiological observations and interpret the data.</li> </ol>
2.	BP102T	PHARMACEUTICAL ANALYSIS THEORY	<p>After the successful completion of the course, students should be able to</p> <ol style="list-style-type: none"> <li>1. Understand the basic concepts and principles involved in titrimetric, gravimetric analysis and its application in the analysis of pharmaceuticals.</li> <li>2. Explain concentration, calculation of a solution, its preparation, standardization and its storage conditions.</li> <li>3. Describe the sources of errors commonly developed during drug analyses and methods to minimize them.</li> <li>4. Understand the basic concepts and principles involved in electrochemical analysis and their applications in the analysis of pharmaceuticals.</li> </ol>
	BP108P	PHARMACEUTICAL ANALYSIS PRACTICAL	<p>After the successful completion of the course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Prepare primary and secondary standard solutions.</li> <li>2. Perform standardization of secondary standard solutions.</li> <li>3. Determine percentage purity of given pharmaceutical drugs by titrimetric analysis.</li> <li>4. Determine normality of a solution by electro-analytical methods.</li> </ol>

3.	BP103T	PHARMACEUTICS- I (Theory)	Upon completion of this course the student should be able to: 1. Understand the history of profession of pharmacy 2. Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations. 3. Know the professional way of handling the prescription 4. To formulate and evaluate various conventional dosage forms.
	BP109P	PHARMACEUTICS- I (Practical)	After the successful completion of the course, students should be able to: 1. Compound some conventional solid, liquid and semisolid dosage forms. 2. Select an appropriate container and storage conditions for a product. 3. Label the pharmaceuticals.
4.	BP104T	PHARMACEUTICAL INORGANIC CHEMISTRY (Theory)	After the successful completion of the course, students should be able to: 1. Explain the effects of impurities in pharmaceuticals. 2. Describe the principles and methods of limit tests to control common impurities in pharmaceutical substances. 3. Explain different pharmaceutical buffers, their preparations, uses in pharmaceutical system, measurement of tonicity. 4. Explain the medicinal importance of pharmaceutical inorganic compounds. 5. Discuss the principles and methodology of assay of several inorganic drugs.
	BP110P	PHARMACEUTICAL INORGANIC CHEMISTRY (Practical)	After the successful completion of the course, students should be able to: 1. Adjudge the level of specific impurities in the given inorganic compounds by performing different limit tests. 2. Use different chemical methods to prepare inorganic pharmaceuticals. 3. Perform identification tests as per Indian Pharmacopoeia. 4. Determine the impurities qualitatively by performing tests for purity.
5.	BP105T	COMMUNICATION SKILLS (Theory)	After the successful completion of the course, students should be able to: 1. Explain the key terminologies of process of communication. 2. Identify the importance of tone, body language and active listening as elements of effective communication. 3. Interpret the factors influencing communication perspectives. 4. Effectively manage the team as a team player 5. Demonstrate effective interview skills. 6. Develop Leadership qualities and essentials.
	BP111P	COMMUNICATION SKILLS (PRACTICAL)	After the successful completion of the course, students should be able to:

			<ol style="list-style-type: none"> <li>1. Recognize phonemes for proper articulation of words.</li> <li>2. Explain the key concepts of writing skills and listening skills.</li> <li>3. Apply listening skills and reading skills for comprehension</li> <li>4. Demonstrate conversation skills using appropriate body language and tone.</li> <li>5. Demonstrate audience – centric presentation Develop professional written document.</li> </ol>
	BP106T	REMEDIAL BIOLOGY THEORY	<p>After the successful completion of the course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Identify a given plant part based on its macroscopic and microscopic characteristics.</li> <li>2. Explain the classification of plants, plant cell and its organelles.</li> <li>3. Describe the physiological processes in plants and humans.</li> <li>4. Explain the type of tissues present in human body.</li> <li>5. Discuss the anatomy and functions of systems of the human body.</li> <li>6. Appraise the coordinated working pattern of different organs of human body.</li> </ol>
	BP112P	REMEDIAL BIOLOGY PRACTICAL	<p>After the successful completion of the course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Identify different types of human bones</li> <li>2. Prepare microscopic sections of parts of the plant.</li> <li>3. Identify various systems of frog using computer models</li> <li>4. Determine Blood groups Record blood pressure and tidal volume</li> </ol>
	BP107T	REMEDIAL MATHEMATICS	<p>After the successful completion of the course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Explains the principles of matrix algebra, analytical geometry, differential and Integral calculus, differential Equations and Laplace Transforms.</li> <li>2. Solve simple problems associated with functions, Limits, continuity and partial fractions.</li> <li>3. Apply the appropriate standard form of matrix algebra and differential equation in solving problems in applications of pharmaceutical equations.</li> <li>4. Solve simple mathematical problems associated with matrix algebra, differential equations and Laplace transforms.</li> <li>5. Solve complex mathematical problems associated with matrix algebra, differential and integral calculus, as well as Laplace Transforms.</li> </ol>
<b>II SEMESTER</b>			
1.	BP201T	HUMAN ANATOMY AND PHYSIOLOGY - II THEORY	<p>After the successful completion of the course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Describe and integrate knowledge about the functions and needs of the various tissues, organs and organ</li> </ol>

			<p>systems, and explain how they relate to health and common pathologies and their pharmacological treatments in the context of disease, trauma and exercise.</p> <p>2. Measure basic physiological parameters, perform basic analyses, and interpret the data, taking into account the limitations of the morphology on the conclusions that can be drawn.</p> <p>3. Integrate knowledge of skills in human physiology with other areas of science such as sport and exercise science, and paramedical courses.</p>
	BP207P	HUMAN ANATOMY AND PHYSIOLOGY - II PRACTICAL	<p>After the successful completion of the course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Categorize nervous system and recognizes cells of the nervous system.</li> <li>2. Explain the importance of nervous system. Explain the physiology of skeletal muscle contraction.</li> <li>3. Explain the properties of digestive and excretory system.</li> <li>4. Explain the importance of respiratory system.</li> <li>5. Explain the structure and functions of male and female reproductive systems.</li> </ol>
2.	BP202T	PHARMACEUTICAL ORGANIC CHEMISTRY –I (Theory)	<p>After the successful completion of the course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. write the structure, name and the type of isomerism of the organic compound</li> <li>2. write the reaction, name the reaction and orientation and mechanism of reactions</li> <li>3. account for reactivity/stability of compounds.</li> <li>4. identify/confirm the identification of organic compound.</li> </ol>
	BP208P	PHARMACEUTICAL ORGANIC CHEMISTRY –I PRACTICAL	<p>After the successful completion of the course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Detect the extra elements present in compounds.</li> <li>2. Identify organic compounds by systematic qualitative analysis.</li> <li>3. Determine the boiling point/melting point of organic compounds.</li> <li>4. Construct molecular models of compounds using atomic models sets.</li> </ol>
3.	BP203T	BIOCHEMISTRY THEORY	<p>After the successful completion of the course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Describe the concepts of biological oxidation and bioenergetics.</li> <li>2. Explain the role, classification and metabolism of various bio molecules i.e. carbohydrates, proteins and lipids</li> <li>3. To study the application of enzyme inhibition in pharmaceutical industry</li> <li>4. Discuss the Metabolism of nucleic acids and protein biosynthesis</li> </ol>
	BP209P	BIOCHEMISTRY PRACTICAL	<p>After the successful completion of the course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Identify normal and abnormal biochemical constituents of urine.</li> </ol>

			<ol style="list-style-type: none"> <li>2. Determine carbohydrates and proteins. Perform identification tests as per Indian Pharmacopoeia.</li> <li>3. Estimate biochemical parameters in blood and urine.</li> <li>4. Analyse and determine the factors affecting enzyme activity.</li> <li>5. Analyse and report the physiological and pathological constituents of urine.</li> <li>6. Handle various instruments used in biochemical investigations.</li> </ol>
4.	BP204T	PATHOPHYSIOLOGY THEORY	<p>After the successful completion of the course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Explain the signs and symptoms of diseases. Describe the principles of Cell Injury and Adaptation.</li> <li>2. Identify storage conditions for inorganic pharmaceuticals.</li> <li>3. Explain the mechanisms involved in inflammation and repair.</li> <li>4. Outline the etiology and pathogenesis of the selected disease states cuss the complications of systemic conditions to their etio-pathogenesis.</li> </ol>
5	BP205T	COMPUTER APPLICATIONS IN PHARMACY THEORY	<p>After the successful completion of the course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Explain the applications of computer in Pharmacy.</li> <li>2. Explain bioinformatics and their impact in vaccine discovery.</li> <li>3. Analyse the different types of databases.</li> <li>4. Create data bases using MS Access, SQL.</li> <li>5. Identify the role of computers for data analysis in the field of preclinical development.</li> </ol>
	BP210P	COMPUTER APPLICATIONS IN PHARMACY PRACTICAL	<p>After the successful completion of the course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Use MS Word to create questionnaires and other documentation related to pharmacy.</li> <li>2. Use MS Access to modify the data bases created.</li> <li>3. Handle web and XML pages to export table, forms and queries.</li> <li>4. Generate report; work with queries on MS Access. Create database, HTML web page.</li> </ol>
6	BP206T	ENVIRONMENTAL SCIENCE THEORY	<p>After the successful completion of the course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Describe the natural resources.</li> <li>2. Generate interest in environment improvement.</li> <li>3. Create awareness about ecosystems and their functions.</li> <li>4. Develop an attitude of concern towards environmental pollution.</li> <li>5. Recommend necessary measures for identifying and solving environmental issues.</li> </ol>

### III SEMESTER

1.	BP301T	PHARMACEUTICAL ORGANIC CHEMISTRY – II(Theory)	Upon completion of the course the student shall be able to 1. Write the structure, name and the type of isomerism of the organic compound. 2. Write the reaction, name the reaction and orientation of reactions 3. Account for reactivity/stability of compounds. 4. Prepare organic compounds.
	BP305P	PHARMACEUTICAL ORGANIC CHEMISTRY - II(Practical)	After the successful completion of the course, students should be able to: 1. Take up synthesis of various organic compounds by different chemical reactions. 2. Purify organic compounds using various procedures like recrystallization and steam distillation. 3. Determine the purity of fats and oils. 4. Calculate the percentage yields of the products obtained by synthesis. 5. Apply recrystallization and steam distillation methods for purification of synthesized organic compounds
2.	BP302T	PHYSICAL PHARMACEUTICS-I (Theory)	Upon the completion of the course student shall be able to 1. Understand various physicochemical properties of drug molecules in the designing the dosage forms. 2. Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations. 3. Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.
	BP306P	PHYSICAL PHARMACEUTICS-I (Practical)	After the successful completion of the course, students should be able to: 1. Perform solubility studies for different drugs. Determine pKa values and estimate HLB values. 2. Perform and determine the percentage composition. 3. Calculate Critical Micellar Concentration of various surfactants.
3.	BP 303 T	PHARMACEUTICAL MICROBIOLOGY (Theory)	Upon completion of the subject student shall be able to: 1. Understand methods of identification, cultivation and preservation of various microorganisms. 2. To understand the importance and implementation of sterilization in pharmaceutical processing and industry. 3. Learn sterility testing of pharmaceutical products. 4. Carried out microbiological standardization of Pharmaceuticals. 5. Understand the cell culture technology and its applications in pharmaceutical industries.
	BP307P	PHARMACEUTICAL MICROBIOLOGY (Practical)	After the successful completion of the course, students should be able to: 1. Study of apparatus used in microbiology Different methods of sterilization and sterility testing of pharmaceuticals.

			<ol style="list-style-type: none"> <li>2. Prepare culture media for the growth of microorganisms.</li> <li>3. Identify and isolate bacteria.</li> <li>4. Perform aseptic procedures for inoculation.</li> <li>5. Determine MIC of antimicrobial agents.</li> </ol>
4.	BP 304T	PHARMACEUTICAL ENGINEERING (Theory)	<p>Upon completion of the course student shall be able:</p> <ol style="list-style-type: none"> <li>1. To know various unit operations used in Pharmaceutical industries.</li> <li>2. To understand the material handling techniques.</li> <li>3. To perform various processes involved in pharmaceutical manufacturing process.</li> <li>4. To carry out various test to prevent environmental pollution.</li> <li>5. To appreciate and comprehend significance of plant lay out design for optimum use of resources.</li> <li>6. To appreciate the various preventive methods used for corrosion control in pharmaceutical industries.</li> </ol>
	BP 308T	PHARMACEUTICAL ENGINEERING (Practical)	<p>Upon completion of the course student shall be able:</p> <ol style="list-style-type: none"> <li>1. Perform experiments related to unit operations</li> <li>2. Operate equipments used in the manufacture of pharmaceutical products.</li> <li>3. Interpret results of the experiments conducted</li> <li>4. Illustrate the material and energy requirements for optimizing the pharmaceutical unit processes.</li> </ol>

## IV SEMESTER

1.	BP401T	PHARMACEUTICAL ORGANIC CHEMISTRY –III (Theory)	<p>At the end of the course, the student shall be able to</p> <ol style="list-style-type: none"> <li>1. understand the methods of preparation and properties of organic compounds</li> <li>2. explain the stereo chemical aspects of organic compounds and stereo chemical reactions</li> <li>3. know the medicinal uses and other applications of organic compounds</li> </ol>
2.	BP402T	MEDICINAL CHEMISTRY – I (Theory)	<p>Upon completion of the course the student shall be able to</p> <ol style="list-style-type: none"> <li>1. understand the chemistry of drugs with respect to their pharmacological activity.</li> <li>2. understand the drug metabolic pathways, adverse effect and therapeutic value of drugs.</li> <li>3. know the Structural Activity Relationship (SAR) of different class of drugs.</li> <li>4. write the chemical synthesis of some drugs.</li> </ol>
	BP406P	MEDICINAL CHEMISTRY – I (Practical)	<p>After successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Synthesize medicinal compounds.</li> <li>2. Estimate partition coefficient of drugs.</li> <li>3. Determine the amount of drug present in a sample.</li> <li>4. Estimate purity of drugs.</li> </ol>
3.	BP 403 T	PHYSICAL PHARMACEUTICS-II (Theory)	<p>Upon the completion of the course student shall be able to</p> <ol style="list-style-type: none"> <li>1. Understand various physicochemical properties of drug molecules in the designing the dosage forms.</li> </ol>

			<p>2. Know the principles of chemical kinetics &amp; to use them for stability testing and determination of expiry date of formulations.</p> <p>3. Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.</p>
	BP407P	PHYSICAL PHARMACEUTICS-II (Practical)	<p>After successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Estimate various flow properties of powders.</li> <li>2. Determine the particle size using various methods.</li> <li>3. Understand the effect of suspending agents on sedimentation volume.</li> <li>4. Determine various order of reactions.</li> </ol>
4.	BP 404T	PHARMACOLOGY-I (Theory)	<p>Upon completion of this course the student should be able to</p> <ol style="list-style-type: none"> <li>1. Understand the pharmacological actions of different categories of drugs</li> <li>2. Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.</li> <li>3. Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.</li> <li>4. Observe the effect of drugs on animals by simulated experiments</li> <li>5. Appreciate correlation of pharmacology with other bio medical sciences</li> </ol>
	BP408P	PHARMACOLOGY-I (Practical)	<p>After successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Identify the appliances used in experimental pharmacology.</li> <li>2. Demonstrate routes of drug administration in animals</li> <li>3. Choose suitable anesthetics for animal studies.</li> <li>4. Demonstrate drug action using computer models.</li> <li>5. Perform common laboratory techniques in animals.</li> <li>6. Recommend procedures for laboratory animal maintenance.</li> </ol>
5.	BP 405 T	PHARMACOGNOSY AND PHYTOCHEMISTRY I (Theory)	<p>Upon completion of the course, the student shall be able</p> <ol style="list-style-type: none"> <li>1. to know the techniques in the cultivation and production of crude drugs.</li> <li>2. to know the crude drugs, their uses and chemical nature.</li> <li>3. know the evaluation techniques for the herbal drugs</li> <li>4. To carry out the microscopic and morphological evaluation of crude drugs.</li> </ol>
	BP409 P	PHARMACOGNOSY AND PHYTOCHEMISTRY I (Practical)	<p>After successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Demonstrate chemical tests to identify unorganized crude drugs.</li> <li>2. Evaluate the quality and purity of crude drugs.</li> <li>3. Perform linear measurements for crude drug identification.</li> <li>4. Develop quality control methods for standardisation of herbal drugs.</li> </ol>



## V SEMESTER

1.	BP501T	MEDICINAL CHEMISTRY – II (Theory)	Upon completion of the course the student shall be able to 1. Understand the chemistry of drugs with respect to their pharmacological activity. 2. Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs. 3. Know the Structural Activity Relationship of different class of drugs. 4. Study the chemical synthesis of selected drugs.
2.	BP 502 T	Industrial Pharmacy I (Theory)	Upon completion of the course the student shall be able to 1. Know the various pharmaceutical dosage forms and their manufacturing techniques. 2. Know various considerations in development of pharmaceutical dosage forms. 3. Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality. 4. Develop cosmetics and with desired Safety, stability, and efficacy.
	BP 506 P	Industrial Pharmacy I (Practical)	After successful completion of this course students will be able to: 1. Prepare formulations of different dosage forms as per the batch formula. 2. Select suitable packaging container for a dosage form. 3. Operate different equipment's used in preparation of dosage forms. 4. Relate the physicochemical properties of drugs to dosage form characteristics. 5. Evaluate different dosage forms by performing quality control tests.
3.	BP503T	PHARMACOLOGY-II (Theory)	Upon completion of this course the student should be able to 1. Understand the mechanism of drug action and its relevance in the treatment of different diseases 2. Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments 3. Demonstrate the various receptor actions using isolated tissue preparation 4. Appreciate correlation of pharmacology with related medical sciences
	BP507 P	PHARMACOLOGY-II (PRACTICAL)	After successful completion of this course students will be able to: 1. Choose physiological salt solutions for isolated tissue preparations. 2. Demonstrate drug effects using computer models. 3. Conduct experiments on isolated tissue preparation and in vivo studies. 4. Interpret the effect of spasmogens and spasmolytics on suitable tissue preparations

4.	BP504 T	PHARMACOGNOSY AND PHYTOCHEMISTRY II (Theory)	Upon completion of the course, the student shall be able to 1. To know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents. 2. To understand the preparation and development of herbal formulation. 3. To understand the herbal drug interactions. 4. To carryout isolation and identification of phytoconstituents
	BP508P	PHARMACOGNOSY AND PHYTOCHEMISTRY II (Practical)	After successful completion of this course students will be able to: 1. Identify crude drugs by morphological and microscopical characteristics. 2. Isolate phytoconstituents from crude drugs. 3. Perform Paper and Thin Layer Chromatography. 4. Isolate and analyse volatile oils. 5. Carryout chemical tests for the identification of unorganized crude drugs
5.	BP 505 T	PHARMACEUTICAL JURISPRUDENCE (Theory)	Upon completion of the course, the student shall be able to understand: 1. The Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals. 2. Various Indian pharmaceutical Acts and Laws. 3. The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals. 4. The code of ethics during the pharmaceutical practice.

## VI SEMESTER

1.	BP601T	MEDICINAL CHEMISTRY - III (Theory)	Upon completion of the course student shall be able to 1. Understand the importance of drug design and different techniques of drug design. 2. Understand the chemistry of drugs with respect to their biological activity. 3. Know the metabolism, adverse effects and therapeutic value of drugs. 4. Know the importance of SAR of drugs.
	BP607P	MEDICINAL CHEMISTRY-III (Practical)	After successful completion of this course students will be able to: 1. Explain the physic chemical properties of drugs using drug design software. 2. Draw chemical structures and reactions by Chem draw software. 3. Analyze the purity of medicinal compounds. 4. Prepare medicinally important compounds / intermediates.
2.	BP602 T	PHARMACOLOGY-III (Theory)	Upon completion of this course the student should be able to: 1. understand the mechanism of drug action and its relevance in the treatment of different infectious diseases 2. comprehend the principles of toxicology and treatment of various poisonings and

			3. appreciate correlation of pharmacology with related medical sciences.
	BP 608 P	PHARMACOLOGY-III (Practical)	After successful completion of this course students will be able to: 1. Calculate doses for laboratory animals. 2. Perform toxicity studies following standard guidelines. 3. Estimate biochemical parameters in body fluids. 4. Demonstrate effect of drugs using computer models. 5. Apply statistical methods for interpretation of experimental results.
3.	BP 603 T	HERBAL DRUG TECHNOLOGY (Theory)	Upon completion of this course the student should be able to: 1. understand raw material as source of herbal drugs from cultivation to herbal drug product. 2. know the WHO and ICH guidelines for evaluation of herbal drugs. 3. know the herbal cosmetics, natural sweeteners, nutraceuticals. 4. appreciate patenting of herbal drugs, GMP.
	BP609 P	HERBAL DRUG TECHNOLOGY (Practical)	After undergoing this course students will be able to: 1. Perform phytochemical screening of the extracts. 2. Prepare herbal formulations and herbal cosmetics using standardised extracts. 3. Evaluate excipients of natural origin. 4. Carryout monograph analysis of herbal drugs. 5. Determine alcohol content, aldehyde content, total alkaloids and phenol content.
4.	BP 604 T	BIOPHARMACEUTICS AND PHARMACOKINETICS (Theory)	Upon completion of the course student shall be able to: 1. Understand the basic concepts in biopharmaceutics and pharmacokinetics and their significance. 2. Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination. 3. To understand the concepts of bioavailability and bioequivalence of drug products and their significance. 4. Understand various pharmacokinetic parameters, their significance & applications.
5.	BP 605 T	PHARMACEUTICAL BIOTECHNOLOGY (Theory)	Upon completion of the subject student shall be able to: 1. Understanding the importance of Immobilized enzymes in Pharmaceutical Industries. 2. Genetic engineering applications in relation to production of pharmaceuticals. 3. Importance of Monoclonal antibodies in Industries. 4. Appreciate the use of microorganisms in fermentation technology.
6.	BP606T	PHARMACEUTICALQUALITY ASSURANCE(Theory)	Upon completion of the course student shall be able to: 1. Understand the cGMP aspects in a pharmaceutical industry. 2. Appreciate the importance of documentation.

			<p>3. Understand the scope of quality certifications applicable to pharmaceutical industries.</p> <p>4. Understand the responsibilities of QA &amp; QC departments.</p>
<b>VII SEMESTER</b>			
1.	BP701T	INSTRUMENTAL METHODS OF ANALYSIS (Theory)	<p>Upon completion of the course the student shall be able to</p> <ol style="list-style-type: none"> <li>1. Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis.</li> <li>2. Describe the fundamental principles and applications of spectroscopic techniques Viz., UV- Visible, IR, FTIR, Flame photometry and Nephelo-turbidimetry</li> <li>3. Understand the chromatographic, electrophoretic separation and analysis of drugs.</li> <li>4. Perform quantitative &amp; qualitative analysis of drugs using various analytical instruments.</li> </ol>
	BP705P	INSTRUMENTAL METHODS OF ANALYSIS (Practical)	<p>After successful completion of this course students will be able to:</p> <ol style="list-style-type: none"> <li>1. Discuss the effect of impurities on the quality of drugs and behavioural pattern of drugs.</li> <li>2. Understand the SOP and usage of software associated with various analytical instruments.</li> <li>3. Gain knowledge of interpretation of spectra and of chromatograms.</li> </ol>
2.	BP 702 T	INDUSTRIAL PHARMACY II (Theory)	<p>Upon completion of the course, the student shall be able to:</p> <ol style="list-style-type: none"> <li>1. Know the process of pilot plant and scale up of pharmaceutical dosage forms.</li> <li>2. Understand the process of technology transfer from lab scale to commercial batch.</li> <li>3. Know different Laws and Acts that regulate pharmaceutical industry.</li> <li>4. Understand the approval process and regulatory requirements for drug products.</li> </ol>
3.	BP 703T	PHARMACY PRACTICE (Theory)	<p>Upon completion of the course, the student shall be able to</p> <ol style="list-style-type: none"> <li>1. Know various drug distribution methods in a hospital.</li> <li>2. Appreciate the pharmacy stores management and inventory control.</li> <li>3. Monitor drug therapy of patient through medication chart review and clinical review.</li> <li>4. Obtain medication history interview and counsel the patients.</li> <li>5. Identify drug related problems</li> <li>6. detect and assess adverse drug reactions.</li> <li>7. Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states.</li> <li>8. Know pharmaceutical care services.</li> <li>9. Do patient counselling in community pharmacy.</li> <li>10. Appreciate the concept of Rational drug therapy.</li> </ol>

4.	BP 704T	NOVEL DRUG DELIVERY SYSTEMS (Theory)	After successful completion of this course students will be able to: 1. Understand the concepts and applications of Novel Drug Delivery Systems. 2. Apply knowledge in developing various novel formulations as per requirements. 3. Analyze various evaluation parameters for oral, parenteral, topical etc. drug delivery systems. 4. Formulate industrially feasible, cost-effective strategy for development of new dosage forms.
5.		PRACTICE SCHOOL	After successful completion of this course students will be able to: 1. Apply the knowledge acquired in a practical way. 2. Develop co-operative learning skill. 3. Do real time problem solving.

## VIII SEMESTER

2	BP 801T	BIOSTATISTICS AND RESEARCH METHODOLOGY (THEORY)	After successful completion of this course students will be able to: 1. Recognize the importance of biostatistics in pharmacy. 2. Select appropriate clinical study design for clinical studies. 3. Write the components of protocol used in clinical experiments. 4. Statistically calculate the sample size required for the clinical studies. 4. Display the outcome of the clinical studies by selecting appropriate graphs. 5. Present, organize, and summarize the collected clinical data by descriptive statistics. 6. Generalize the results from the sample study to the appropriate population by testing of hypothesis with the help of inferential statistics. 7. Demonstrate the operation of M.S. Excel, SPSS, MINITAB(R), DoE (Design of Experiment)
2	BP 802T	SOCIAL AND PREVENTIVE PHARMACY	After successful completion of this course students will be able to: 1. Explain the concepts of health, disease, hygiene and socio-cultural factors related to health. 2. Explain the concepts of prevention, control and cause of diseases. 3. Analyse the different national health intervention programmes. 4. Describe the Objectives, functioning and importance of national programmes for prevention and control of diseases. 5. Discuss the types of community services offered in urban and rural areas. 6. Illustrate the general measures of prevention and control of infections and diseases

3	BP803ET	PHARMA MARKETING MANAGEMENT (Theory)	After successful completion of this course students will be able to: 1. Marketing concepts and techniques and the application of the same in the pharmaceutical industry. 2. Market research and distribution channels along with their implementation in the pharmaceutical industry. 3. Concepts of branding and product management. 4. Theories on promotion, sales and pricing of a product
4	BP804 ET	PHARMACEUTICAL REGULATORY SCIENCE (Theory)	Upon completion of the subject student shall be able to: 1. Know about the process of drug discovery and development. 2. Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals. 3. Know the regulatory approval process and their registration in Indian and international markets
5	BP805ET	PHARMACOVIGILANCE (Theory)	After successful completion of this course students will be able to: 1. Appreciate the historical development and describe the national and international scenario of pharmacovigilance. 2. Describe the drug disease classification, coding and terminologies used in pharmacovigilance. 3. Detect, assess and manage the adverse drug reactions. 4. Learn the vaccine safety surveillance, pharmacogenomics, ICH guidelines and CIOMS. 5. Assess the methods to generate safety data during post approval phases of the drug.
6	BP 806 ET	QUALITY CONTROL AND STANDARDIZATION OF HERBALS	Upon completion of the subject student shall be able to: 1. Know WHO guidelines for quality control of herbal drugs. 2. Know Quality assurance in herbal drug industry. 3. Know the regulatory approval process and their registration in Indian and international markets. 4. Appreciate EU and ICH guidelines for quality control of herbal drugs.
7	BP 807 ET	COMPUTER AIDED DRUG DESIGN (Theory)	Upon completion of the course, the student shall be able to understand 1. Design and discovery of lead molecules. 2. The role of drug design in drug discovery process. 3. The concept of QSAR and docking. 4. Various strategies to develop new drug like molecules. 5. The design of new drug molecules using molecular modelling software.
8	BP808ET	CELL AND MOLECULAR BIOLOGY (Elective subject)	After successful completion of this course students will be able to: 1. Explain the receptor signal transduction processes and molecular pathways affected by drugs. 2. It also appreciate the applicability of molecular pharmacology and biomarkers in drug discovery process. 3. Explain the flow of genetic information from DNA to Proteins.

			4. Apply the concepts of rDNA technologies and genomics analysis to discover new therapeutic drug molecules
9	BP809ET	COSMETIC SCIENCE(Theory)	After undergoing this course, student will be able to: 1. Classification and key components used in different cosmetics and cosmeceuticals. 2. Recognize the role of the ingredients and herbs used. 3. Advanced current technologies used for manufacturing the cosmetics at lab scale and industry scale. 4. Justify the need for skin care and sun screen products. 5. Scientific learning's to develop cosmetics and cosmeceuticals with desired Safety, sensory, stability, and efficacy
10	BP810 ET	PHARMACOLOGICAL SCREENING METHODS	After successful completion of this course students will be able to: 1. Describe the regulatory guideline for maintenance and conduct of experiments on laboratory animals. 2. Design the protocol for preclinical drug discovery. 3. Expertise in routes of drug administration and blood withdrawal techniques using animals. 4. Adeptness in animal dose calculation. 5. Proficiency in interpretation of preclinical statistical preclinical data
11	BP 811 ET	ADVANCED INSTRUMENTATION TECHNIQUES	After successful completion of this course students will be able to: 1. Understand significance and concept of advanced instrumentation. 2. Understand the benefits of advanced instruments in comparison with other conventional methods. 3. To work on downsizing the conventional methods. 4. Become proficient in advanced instruments. 5. Implement the knowledge of choosing the right instruments
12	BP 812 ET	DIETARY SUPPLEMENTS AND NUTRACEUTICALS	By the end of the course, students should be able to: 1. Understand the need of supplements by the different group of people to maintain healthy life. 2. Understand the outcome of deficiencies in dietary supplements. 3. Appreciate the components in dietary supplements and the application. 4. Appreciate the regulatory and commercial aspects of dietary supplements including health claims.
		PROJECT WORK	After successful completion of this course students will be able to: 1. Work in team and undertake a project in the area of Pharmacy. 2. Apply concepts of pharmaceutical sciences for executing the project 3. Apply appropriate research methodology while formulating a project 4. Present, exhibit and document the project work 5. Develop a project report

