

## PROGRAM OUTCOMES OF B.PHARM

Sr. No.	Program Outcomes
1.	<b>Pharmacy Knowledge:</b> Possess knowledge and comprehension of the core and basic knowledge, associated with the profession of pharmacy, including biomedical sciences, pharmaceutical sciences, behavioral, social, and administrative pharmacy sciences, and manufacturing practices.
2.	<b>Planning Abilities:</b> Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
3.	<b>Problem Analysis:</b> Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.
4.	<b>Modern tool usage:</b> Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy related computing tools with an understanding of the limitations.
5.	<b>Leadership Skills:</b> Understand and consider the human reaction to change, motivation issues, leadership and team building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well being.
6.	<b>Professional Identity:</b> Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
7.	<b>Pharmaceutical Ethics:</b> Honor personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
8.	<b>Communication:</b> Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
9.	<b>The Pharmacist and society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
10.	<b>Environment and sustainability:</b> Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
11.	<b>Life-long learning:</b> Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self-assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

**Revised Course Outcomes for Academic Year 2019-20, 2021-2022.**

**Course Outcomes (COs) for all the courses of the B.Pharm Program**

*At the end of the Course, a student should be able to:*

<i>Course Code</i>	<i>COs</i>	<i>Outcomes</i>
<b>B.PHARM SEM-I</b>		
<b>Human Anatomy and Physiology-I (T)P111</b>	<b>CP111.1</b>	Explain anatomy of various organs of Human body.
	<b>CP111.2</b>	Explain Physiology of various organs of Human body.
	<b>CP111.3</b>	Understand the various Homeostatic mechanisms and their imbalance
	<b>CP111.4</b>	Appreciate coordination between different organs and systems.
	<b>CP111.5</b>	Define various diseases and disorders.
<b>Human Anatomy and Physiology-I (P)P112</b>	<b>CP112.1</b>	Identify the major tissue types and locate examples of each in the body.
	<b>CP112.2</b>	Describe the different types of bones and provide an example of each type.
	<b>CP112.3</b>	Recognizing bleeding time, clotting time and ESR of blood.
	<b>CP112.4</b>	Interpret different blood cell count.
<b>Pharmaceutical Analysis-I (T)121</b>	<b>CP121.1</b>	Explain the different techniques of analysis on the basis of their classification. (Understanding, evaluating)
	<b>CP121.2</b>	Identify different sources, types of errors and methods for minimization of errors.
	<b>CP121.3</b>	Explain the principles of different volumetric methods of analysis. (Understanding, evaluating)
	<b>CP121.4</b>	Illustrate the principles of different electrochemical methods of analysis. (Understanding)
	<b>CP121.5</b>	Develop analytical skills. (Applying)
<b>Pharmaceutical Analysis-I (P)122</b>	<b>CP122.1</b>	Demonstrate various skills related to Pharmaceutical Analysis. (Understanding)
	<b>CP122.2</b>	Identify limit tests for different chemical impurities. (Applying)
	<b>CP122.3</b>	Plan the preparation and standardization of titrants used in volumetric analysis.(Applying)
	<b>CP122.4</b>	Estimate/ analyse the different excipients by various volumetric analysis techniques. (Evaluating)
	<b>CP122.5</b>	Estimate normality and strength of various acids by electrochemical methods of analysis. (Evaluating)
<b>PharmaceuticsI (T)131</b>	<b>CP131.1</b>	Explain the history, evaluation, scope & career in pharmacy profession.
	<b>CP131.2</b>	Apply the standards laid down by different pharmacopoeias to obtain quality formulation.
	<b>CP131.3</b>	Choose appropriate weights& measures to achieve the precision in formulation
	<b>CP131.4</b>	Formulate & evaluate various solid, liquid, semisolid dosage forms
	<b>CP131.5</b>	Outline the guidelines of manufacturing practices, to obtain quality formulation
<b>Pharmaceutics-I (P)132</b>	<b>CP132.1</b>	Know the techniques of weighing, measuring & transferring solids and liquids
	<b>CP132.2</b>	Select the appropriate container and closure for prepared formulation.
	<b>CP132.3</b>	Prepare label as per the guidelines, size and shape of the container.
	<b>CP132.4</b>	Formulate and evaluate monophasic dosage forms

Pharmaceutical Inorganic Chemistry (T)141	CP141.1	Restate history of pharmacopoeia, sources of impurities and the principle involved in limit test for various elements.
	CP141.2	Apply the knowledge of buffers, buffer equations & isotonicity for calculation of tonicity adjustment and physiological acid base balance.
	CP141.3	Explain the functions of physiological ions and electrolyte replacement therapy.
	CP141.4	Express the properties, method of preparation, assay and medicinal uses of GI agents, expectorants, emetics, haematinics, dental products and antidotes.
	CP141.5	Discuss the concept of anemia and poisoning.
	CP141.6	Recall different aspects of radiopharmaceuticals.
Pharmaceutical Inorganic Chemistry (P)142	CP142.1	Perform limit tests for various elements in given sample.
	CP142.2	Practice the purity tests and identification tests of the various medicinal and pharmaceutical agents.
	CP142.3	Synthesize inorganic pharmaceuticals.
	CP142.4	Interpret the results and record the findings.
Communication skills (T)151	CP151.1	Recognize the importance of communication-verbally and non-verbally.
	CP151.2	Read, write and speak English effectively, thereby become more confident.
	CP151.3	Develop good listening skills.
	CP151.4	Recognize the role of non-verbal aspect of communication that is body language in communication.
	CP151.5	Recognize the importance of accepting other's view point,
<b>B.PHARM SEM-II</b>		
Human Anatomy and Physiology-II (T)211	CP211.1	Explain anatomy of various organs of Human body.
	CP211.2	Explain Physiology of various organs of Human body.
	CP211.3	Understand the various Homeostatic mechanisms and their imbalance
	CP211.4	Appreciate coordination between different organs and systems.
	CP211.5	Define various diseases and disorders.
Human Anatomy and Physiology-II (P)212	CP212.1	Identify and know the major components of the circulatory and lymphatic system.
	CP212.2	Describe the flow of blood through the heart and the role of each atrium, ventricle and valve in this process.
	CP212.3	Summarize the components and functions of major digestive juices, and explain where they are produced.
	CP212.4	Explain pulmonary ventilation and identify the structures and identify the major components of the urinary system and describe their functions.
Pharmaceutical Organic Chemistry-I (T) 221	CP221.1	Name the organic compound as per common name and IUPAC.
	CP221.2	Identify types of isomerism and hybridization of organic compound.
	CP221.3	Remember method of preparation, name and orientation of the reactions of organic compound.
	CP221.4	Illustrate the reactivity and stability of compound.
Pharmaceutical Organic Chemistry-I (P)222	CP222.1	Perform qualitative analysis of unknown organic compound.
	CP222.2	Synthesize suitable solid derivatives of organic compound.
	CP222.3	Construct the molecular models of organic compound.
	CP222.4	Interpret the results and record the findings.

<b>Biochemistry (T)231</b>	<b>CP231.1</b>	Define, classify and write the structures of different nutrient molecules and explain their biological functions. (Remembering, Understanding and evaluating).
	<b>CP231.2</b>	Explain the metabolism of nutrient molecules in physiological and pathological conditions. (Understanding, evaluating)
	<b>CP231.3</b>	Illustrate the catalytical role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes. (Understanding)
	<b>CP231.4</b>	Explain the genetic organization of mammalian genome and functions of DNA in synthesis of RNAs and proteins. (Understanding, evaluating)
	<b>CP231.5</b>	Tell bioenergetics, electron transport chain and oxidative phosphorylation associated with living cells. (Remembering)
<b>Biochemistry (P)232</b>	<b>CP232.1</b>	Analyze qualitatively the given sample of carbohydrate and proteins. (Analyzing)
	<b>CP232.2</b>	Analyze qualitatively the normal and abnormal constituents of urine and correlate with physiological and pathological conditions. (Analyzing)
	<b>CP232.3</b>	Estimate quantitatively the normal and abnormal constituents from biological fluids.(Evaluating)
	<b>CP232.4</b>	Discuss enzyme kinetics and enzyme activity. (Creating)
	<b>CP232.5</b>	Make use of observations, interpret results and draw conclusion. (Applying)
<b>Pathophysiology (T)241</b>	<b>CP241.1</b>	Discuss the basic concepts of cell injury, pain, inflammation and hyper sensitivity.
	<b>CP241.2</b>	Explain etiology and pathogenesis of certain diseases & disorders of human body.
	<b>CP241.3</b>	Discuss the clinical manifestations and complication of the diseases.
	<b>CP241.4</b>	Discriminates between normal and abnormal clinical values of physiological parameters.
<b>Computer Applications in Pharmacy (T) 251</b>	<b>CP251.1</b>	Choose suitable operating system for performing a computer operation.
	<b>CP251.2</b>	Choose suitable operating system for performing a computer operation.
	<b>CP251.3</b>	Generate or prepare reports or presentations using Microsoft office application software.
	<b>CP251.4</b>	Create drawings using "Paint" software.
	<b>CP251.5</b>	Recognize the importance of networking of computers and use internet for obtaining scientific information.
<b>Computer Applications in Pharmacy (P) 252</b>	<b>CP252.1</b>	Execute a given task using DOS commands and or in windows
	<b>CP252.2</b>	Demonstrate the skills of using computers for creating documents, graphs, use of formulae employing MS-Word, MS-EXCEL.
	<b>CP252.3</b>	Present a concept using power point presentation
	<b>CP252.4</b>	Create designing / drawing using paint software
	<b>CP252.5</b>	Prepare an adobe acrobate reader document, read, explore website for gathering scientific and patent related information.
<b>B.PHARM SEM-III</b>		
<b>Pharmaceutical Organic chemistry-II (T)311</b>	<b>CP311.1</b>	Explain the structure, synthesis, reactions, orientation of monosubstituted benzene & its derivatives.
	<b>CP311.2</b>	Discuss & predict effects of substituent's on acidity of phenols, aromatic carboxylic acid & basicity of aromatic amines.
	<b>CP311.3</b>	Define & describe different analytical constants & their significance of fats & oils.
	<b>CP311.4</b>	Write structures, synthesis, reactions & their derivatives of Naphthalene, Anthracene&Phenanthrene.

	<b>CP311.5</b>	Discuss method of preparations, reactions & explain about stabilities of cycloalkanes.
<b>Pharmaceutical Organic chemistry-II (P)312</b>	<b>CP312.1</b>	Demonstrate the Recrystallisation & steam distillation laboratory techniques
	<b>CP312.2</b>	Estimate Acid, Saponification & Iodine values for given samples of oil.
	<b>CP312.3</b>	Prepare the given organic compound by different organic reactions.
	<b>CP312.4</b>	Write the report of the experiment.
<b>Physical Pharmaceutics-I (T)321</b>	<b>CP321.1</b>	Discuss principle, types of solvents including solubility of gas, liquid, and solids in various phases. (Application).
	<b>CP321.2</b>	Explain state of matter and various physicochemical properties of state of Matter. (comprehension)
	<b>CP321.3</b>	Elaborate the significance of surface and interfacial tension in the design of dosage forms. (Synthesis)
	<b>CP321.4</b>	Discuss principle, classification and application of Complexation and Protein Binding. (Comprehension, Evaluation)
	<b>CP32.5</b>	Explain the role of pH, Buffers, buffer capacity in pharmaceutical and biological Systems. (Comprehension)
<b>Physical Pharmaceutics-I (P)322</b>	<b>CP322.1</b>	Estimate different parameters of drug like solubility, CST, Partition coefficient. (Comprehension, Evaluation)
	<b>CP322.2</b>	Determine the pKa value by half neutralization / Henderson Hasselbalch equation. (Evaluation)
	<b>CP322.3</b>	Practice Surface tension, HLB number, and Freundlich and Langmuir constants estimation. (Application, Evaluation).
	<b>CP322.4</b>	Analyze stability constant and donor acceptor ratio for various complexes. (Application, Evaluation).
	<b>CP322.5</b>	Compile a comprehensive lab report on the finding. (Application)
<b>Pharmaceutical Microbiology (T)331</b>	<b>CP331.1</b>	Define method of fundamental concept, identification, cultivation and preservation of various microorganism.
	<b>CP331.2</b>	Explain the importance and implementation of sterilization in pharmaceutical processing and industry and sterility testing of pharmaceutical product.
	<b>CP331.3</b>	Outline designing of aseptic area, sources of contamination of aseptic area and clean area classification.
	<b>CP331.4</b>	Discuss different method of microbiological assay, method for standardization of antibiotics, vitamins and amino acids.
	<b>CP331.5</b>	Explain types, factors affecting microbial spoilage, types of microbial contamination and its assessment.
	<b>CP331.6</b>	Define the cell culture technology and its application in pharmaceutical industry.
<b>Pharmaceutical Microbiology (P)332</b>	<b>CP332.1</b>	Illustrate the lab safety instruction and handling of instrument
	<b>CP332.2</b>	Formulation of culture media
	<b>CP332.3</b>	Isolate, recognise and report the microbes for its different characters
	<b>CP332.4</b>	Analyze biochemical test.
	<b>CP332.5</b>	Evaluate antibiotics sensitivity assay and sterility test for pharmaceuticals.
<b>Pharmaceutical Engineering (T) 341</b>	<b>CP331.1</b>	Summarize various unit operations, fundamental concepts and engineering principles used in Pharmaceutical industries
	<b>CP331.2</b>	Employ the basic concept of process parameters of pharmaceutical equipment involving different unit operations.
	<b>CP331.3</b>	Select various material handling systems
	<b>CP331.4</b>	Apply various tests to prevent environmental pollution.
	<b>CP331.5</b>	Choose methods used for corrosion control in Pharmaceutical industries.

<b>Pharmaceutical Engineering (P) 342</b>	<b>CP332.1</b>	Plan and execute an experiment to evaluate drying, filtration, evaporation, distillation, solubility, humidity and fluid flow determination, radiation constant determination and construct drying curves.
	<b>CP332.2</b>	Monitor different industrial unit operational processes
	<b>CP332.3</b>	Explain and verify experiments of size reduction, size separation, blending and crystallization
	<b>CP332.4</b>	Record observations as per standard protocol.
	<b>CP332.5</b>	Interpret results and draw conclusion
<b>B.PHARM SEM-IV</b>		
<b>Pharmaceutical Organic Chemistry-III (T)411</b>	<b>CP411.1</b>	Define, classify & describe Isomerism, enantiomerism, nomenclature, resolution of racemic mixture, asymmetric synthesis & reactions of chiral molecule.
	<b>CP411.2</b>	Illustrate on Geometrical isomers, its nomenclature, conformational isomerism, atropisomerism, stereoselective & stereospecific reactions.
	<b>CP411.3</b>	Write the structure, prepare, reactions & medicinal uses of five membered heterocyclic ring containing heteroatom/s.
	<b>CP411.4</b>	Write the structure, prepare, reactions & medicinal uses of six membered & fused heterocyclic ring containing one & two heteroatoms.
	<b>CP411.5</b>	Explain & illustrate on important reaction such as reduction, rearrangement & condensation carried out in pharmaceutical organic chemistry.
<b>Medicinal Chemistry-I (T)421</b>	<b>CP421.1</b>	Explain correlation between physicochemical properties of drug molecule and biological activity.
	<b>CP421.2</b>	Discuss the drug metabolic pathway, adverse effect and therapeutic value of drug.
	<b>CP421.3</b>	Define the structural activity relationship of different class of drug.
	<b>CP421.4</b>	Write the nomenclature of drugs and chemical synthesis of drug.
<b>Medicinal Chemistry-I (P)422</b>	<b>CP422.1</b>	Experiment synthesis of given organic medicinal intermediate
	<b>CP422.2</b>	Simplify assay of drugs.
	<b>CP422.3</b>	Discuss partition coefficient of drug.
	<b>CP422.4</b>	Record and interpret the result.
<b>Physical Pharmaceutics-II (T)431</b>	<b>CP431.1</b>	Illustrate properties, method of preparation and application of colloids.(Application)
	<b>CP431.2</b>	Illustrate Newtonian and Non-Newtonian types of system along with methods for determinations of viscosity.(Evaluation)
	<b>CP431.3</b>	Describe classifications of dispersed systems, based on the size of the dispersed particles.( Analysis)
	<b>CP431.4</b>	Explain the importance of particle size and size distribution.(Comprehension, Evaluation.)
	<b>CP431.5</b>	Determine expiry date of dosage forms by accelerated stability studies. (Evaluation)
<b>Physical Pharmaceutics-II (P)432</b>	<b>CP432.1</b>	Explain the importance of particle size and size distribution by sieving and microscopic methods.(Comprehension)
	<b>CP432.2</b>	Estimate different derived properties of powders and effect of lubricant on angle of repose. (Comprehension, Evaluation)
	<b>CP432.3</b>	Demonstration of determination viscosity of liquid and semisolids by Ostwald's Viscometer and Brookfield Viscometer.(Application)
	<b>CP432.4</b>	Analyze the effect of different suspending agent and concentration of single suspending agents on sedimentation volume. (Analysis)
	<b>CP432.5</b>	Determine order of reaction and accelerated stability studies. (Evaluation)

<b>Pharmacology-I</b> (T)441	<b>CP441.1</b>	Describe the scope of pharmacology, general pharmacology and basic aspects of pharmacokinetic and pharmacodynamics properties of drugs
	<b>CP441.2</b>	Explain the mechanism of drug action at organ system/sub cellular/macromolecular levels.
	<b>CP441.3</b>	Elucidate the process of drug discovery and evaluation of safety and efficacy of drugs.
	<b>CP441.4</b>	Explain the organization, functions and neurohumoral transmission of nervous system and pharmacology of drugs acting on nervous system.
	<b>CP441.5</b>	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases/disorders.
<b>Pharmacology-I</b> (P)442	<b>CP442.1</b>	Introduce and describe the experimental pharmacology, commonly used instruments, laboratory animals and CPCSEA guidelines for the maintenance of laboratory animals.
	<b>CP442.2</b>	Explain the pharmacology of anaesthetics and techniques of euthanasia used in experimental pharmacology.
	<b>CP442.3</b>	Describe the commonly used laboratory techniques in experimental pharmacology.
	<b>CP442.4</b>	Apply the basic pharmacology knowledge in the screening of various drugs by simulated experiments.
	<b>CP442.5</b>	Appreciate correlation of simulated experiments using software and videos with in vivo pharmacology.
<b>Pharmacognosy and Phytochemistry-I</b> (T)451	<b>CP451.1</b>	Define; explain historical background and scope of pharmacognosy along with traditional systems of medicine.
	<b>CP451.2</b>	Explain classification of crude drugs along with their origin.
	<b>CP451.3</b>	Apply the knowledge to confirm identity, purity, and quality of natural crude drugs by different adulteration and evaluation techniques.
	<b>CP451.4</b>	Apply the knowledge to produce quality crude drugs by modern skills of cultivation, collection and processing.
	<b>CP451.5</b>	Discuss properties, chemistry, sources, preparation, evaluation, storage and therapeutic uses of crude drugs falling under carbohydrates, proteins, enzymes, natural fibres and lipids.
	<b>CP451.6</b>	Discuss the phytochemical screening techniques and able to identify the phytoconstitutes from crude drugs of natural origin.
<b>Pharmacognosy and Phytochemistry-I</b> (P)452	<b>CP452.1</b>	Evaluate unorganized crude drugs by chemical method.
	<b>CP452.2</b>	Investigate standardization of crude drugs by various parameters.
	<b>CP452.3</b>	Observe types of stomata, phloem fibers, starch grains, and calcium oxalate crystals from plant parts.
	<b>CP452.4</b>	Determine leaf constants by the use of camera Lucida with their significance
<b>B.PHARM SEM-V</b>		
<b>Medicinal Chemistry-II</b> (T)511	<b>CP511.1</b>	Write the nomenclature of drugs having various structural features.
	<b>CP511.2</b>	Discuss correlation between physicochemical properties of drug molecule and biological activity.
	<b>CP511.3</b>	Relate the structure and predict its activity.
	<b>CP511.4</b>	Outline synthetic strategies for obtaining new drugs.
	<b>CP511.5</b>	Select a suitable medicinal agent for specific disease or disorder.
<b>Medicinal Chemistry-II</b> (P)512	<b>CP512.1</b>	Write the nomenclature of drugs having various structural features.(Remembering)
	<b>CP512.2</b>	Discuss correlation between physicochemical properties of drug molecule and biological activity.(Creating)
	<b>CP512.3</b>	Relate the structure and predict its activity.(Understanding and creating)
	<b>CP512.4</b>	Outline synthetic strategies for obtaining new drugs.(Understanding)
	<b>CP512.5</b>	Select a suitable medicinal agent for specific disease or disorder.(Applying)

<b>Industrial Pharmacy-I</b> (T)521	<b>CP521.1</b>	Discuss various pharmaceutical dosage forms and their manufacturing techniques.
	<b>CP521.2</b>	Explain the considerations in development of pharmaceutical dosage forms
	<b>CP521.3</b>	Formulate and evaluate solid, liquid and semisolid dosage forms
	<b>CP521.4</b>	Demonstrate packaging of different dosage forms
<b>Industrial Pharmacy-I</b> (P)522	<b>CP522.1</b>	Formulate and evaluate tablets
	<b>CP522.2</b>	Formulate and evaluate capsules
	<b>CP522.3</b>	Formulate and evaluate injections
	<b>CP522.4</b>	Formulate and evaluate semisolid dosage forms
<b>Pharmacology-II</b> (T)531	<b>CP531.1</b>	Explain fundamental knowledge of classification, Mechanism of action, Therapeutic effects, Clinical use, Side effects & contraindications of drugs on Cardiovascular system.
	<b>CP531.2</b>	Explain fundamental knowledge of classification, Mechanism of action, Therapeutic effects, Clinical use, Side effects & contraindications of drugs on Autacoids and Endocrine system
	<b>CP531.3</b>	Describe the various receptors drug actions on different systems of body like CVS, Autacoids and Endocrine system.
	<b>CP531.4</b>	Outline principles, applications and types of bioassays
	<b>CP531.5</b>	Justify correlation of pharmacology and bioassay with related medical sciences.
<b>Pharmacology-II</b> (P)532	<b>CP532.1</b>	Understand the in-vitro pharmacology and physiological salt solution.
	<b>CP532.2</b>	Demonstrate & isolation of different organs/tissues from the laboratory animals by simulated experiments.
	<b>CP532.3</b>	Appreciate the various receptor actions using isolated tissue preparation.
	<b>CP532.4</b>	Explain basic concepts and their different methods of bioassay.
	<b>CP532.5</b>	Identify the activity of drugs using different models.
<b>Pharmacognosy-II</b> (T)541	<b>CP541.1</b>	Discuss biosynthesis of phytochemical constituents with their medicinal value.
	<b>CP541.2</b>	Define and classify crude drugs along with their sources, properties, phytoconstituents, medicinal importance and commercial applications of secondary metabolites of various classes like alkaloids, glycosides, tannins, resins and volatile oils.
	<b>CP541.3</b>	Describe pharmacognosy of crude drugs of various classes of secondary metabolites.
	<b>CP541.4</b>	Apply the knowledge to isolate, identify and estimate phytoconstituents from crude drugs by modern extraction, chromatography and spectroscopic techniques.
<b>Pharmacognosy-II</b> (P)542	<b>CP542.1</b>	Evaluate crude drugs by morphological, microscopical and chemical analysis.
	<b>CP542.2</b>	Isolate active chemical constituents from crude drugs by extraction and distillation processes.
	<b>CP542.3</b>	Evaluate the phytoconstituents by chromatographic techniques.
	<b>CP542.4</b>	Test unorganized crude drugs by physicochemical analysis.
<b>Pharmaceutical Jurisprudence</b> (T)551	<b>CP551.1</b>	Integrate the knowledge gained about drugs and cosmetics with reference to import, manufacturing, packing, storage and sale of drugs and cosmetics.
	<b>CP551.2</b>	Act as a legal expert in various Indian Pharmaceutical acts and Laws.
	<b>CP551.3</b>	Function effectively as a drug inspector, licensing authority, drug analyst etc.
	<b>CP551.4</b>	Estimate/ Evaluate and give opinion about drug price, prevention of cruelty to animals and Intellectual Rights.

**B.PHARM SEM-VI**

<b>Medicinal Chemistry-III</b> (T)611	<b>CP611.1</b>	Write the nomenclature of drugs having various structural features.
	<b>CP611.2</b>	Discuss correlation between physicochemical properties of drug molecule and biological activity.
	<b>CP611.3</b>	Relate the structure and predict its activity.
	<b>CP611.4</b>	Outline synthetic strategies for obtaining new drugs.
	<b>CP611.5</b>	Select a suitable medicinal agent for specific disease or disorder.
<b>Medicinal Chemistry-III</b> (P)612	<b>CP612.1</b>	Recall the safe handling of very reactive chemical reagent by giving suitable reaction or demonstration of the same
	<b>CP612.2</b>	Experiment with the synthesis of given organic medicinal intermediates.
	<b>CP612.3</b>	Purify and analyze the product by using melting point and TLC.
	<b>CP612.4</b>	Summarize the result and document the observations.
<b>Pharmacology-III</b> (T)621	<b>CP621.1</b>	Explain fundamental knowledge of classification, mechanism of action, therapeutic effects, clinical uses, side effects and contraindications of drugs acting on Respiratory system and Gastro intestinal systems.
	<b>CP621.2</b>	Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases in chemotherapy and immune pharmacology.
	<b>CP621.3</b>	Outline principles of toxicology and principles of treatment of various poisoning.
	<b>CP621.4</b>	Explain principles of chronopharmacology.
	<b>CP621.5</b>	Appreciate correlation of pharmacology with related medical sciences.
<b>Pharmacology-III</b> (P)622	<b>CP622.1</b>	Understand dose calculation in pharmacological experiments
	<b>CP622.2</b>	Demonstration and isolation of different organs/tissues from the laboratory animals by simulated experiments.
	<b>CP622.3</b>	Estimate serum biochemical parameters by using semi auto-analyser
	<b>CP622.4</b>	Explain determination of acute oral toxicity, acute skin, and eye irritation of test substances.
	<b>CP622.5</b>	Understand the calculations of pharmacokinetic parameters from given data and biostatistics methods in experimental pharmacology.
<b>Herbal Drug Technology</b> (T)631	<b>CP631.1</b>	Explain raw material as a source of herbal drugs from cultivation of finished product.
	<b>CP631.2</b>	Explain various herbal drug industry with present and future prospects.
	<b>CP631.3</b>	Apply the pharmaceutical skills in producing nutraceuticals and Ayurvedic formulation along with the natural excipients.
	<b>CP631.4</b>	Describe the safety and efficacy with regulatory requirements of herbal medicine with patenting and GMP.
	<b>CP631.5</b>	Classify, prepare and evaluate herbal cosmetics for skin and hair use.
<b>Herbal Drug Technology</b> (P)632	<b>CP632.1</b>	Identify phytochemical constituents of crude drugs.
	<b>CP632.2</b>	Formulate herbal cosmetics for skin and hair.
	<b>CP632.3</b>	Investigate to standardize excipients, extracts and herbal formulation.
	<b>CP632.4</b>	Analyze herbal ingredients as per monograph of pharmacopoeia.
<b>Biopharmaceutics and pharmacokinetics</b> (T)641	<b>CP641.1</b>	Able to understand the basic concepts of Biopharmaceutics & Pharmacokinetics and their significance.
	<b>CP641.2</b>	Determine factors affecting drug absorption, bioavailability and bioequivalence.
	<b>CP641.3</b>	Describe disposition kinetic models, first order and second order.
	<b>CP641.4</b>	Evaluate the PK parameters related to distribution, metabolism and excretion.

	<b>CP641.5</b>	Explain the clinical pharmacokinetics, and their significance and applications.
<b>Pharmaceutical Biotechnology (T)651</b>	<b>CP651.1</b>	Define and explain historical background, scope and application of biotechnology in various industries.
	<b>CP651.2</b>	Define fermentation and apply the knowledge to manufacture different pharmaceuticals by fermentation technique.
	<b>CP651.3</b>	Discuss genetic engineering and various newer techniques to obtain genetically modified products.
	<b>CP651.4</b>	Explain role of immunology in health and diseases including preparation of vaccines and sera.
<b>Pharmaceutical Quality Assurance (T)661</b>	<b>CP632.1</b>	Define quality assurance, quality control, total quality management and related items.
	<b>CP632.2</b>	Recall the responsibilities of QA and QC departments and importance of documentation.
	<b>CP632.3</b>	Understand the importance of cGMP, GLP, ICH, ISO, NABL accreditation and warehousing.
	<b>CP632.4</b>	Explain the concept of QbD and QC tests for packaging material.
	<b>CP632.5</b>	Elaborate calibration and validation protocol.
<b>B.PHARM SEM-VII</b>		
<b>Instrumental Method of Analysis (T) 711</b>	<b>CP711.1</b>	Define common terminologies like spectroscopy, chromatography and its types.
	<b>C711.2</b>	Discuss basic principles involved in spectroscopy and chromatography.
	<b>CP711.3</b>	Explain the instrumentation of UV, IR, fluorimeter, flame photometer, AAS, HPLC, GC.
	<b>CP711.4</b>	Explain separation and identification of compounds by various chromatographic techniques and electrophoresis technique.
	<b>CP711.5</b>	Recall applications of various spectroscopic and chromatographic techniques for organic, inorganic and natural products.
<b>Instrumental Method of Analysis (P)712</b>	<b>CP712.1</b>	Demonstrate absorption maxima and effect of solvents on absorption maxima, experiment on HPLC and gas chromatography.
	<b>CP712.2</b>	Practice assay of Paracetamol, simultaneous estimation of ibuprofen and Paracetamol by UV spectroscopy.
	<b>CP712.3</b>	Estimate various ions like sodium, potassium by flame photometry and chlorides and sulphates by nepheloturbidometry.
	<b>CP712.4</b>	Perform colorimetric estimation of dextrose, sulfanilamide.
	<b>CP712.5</b>	Perform fluorimetric estimation of quinine sulphate and quenching of fluorescence.
	<b>CP712.6</b>	Separate amino acids by paper chromatography, sugars by TLC and plant pigments by column chromatography.
<b>Industrial Pharmacy-II (T)721</b>	<b>CP721.1</b>	Explain the process of pilot plant and scale up of pharmaceutical dosage forms.
	<b>CP721.2</b>	Describe the process of technology transfer from lab scale to commercial batch.
	<b>CP721.3</b>	Familiar with different Laws and Acts that regulate pharmaceutical industry.
	<b>CP721.4</b>	Illustrate the approval process and regulatory requirements for drug products.
<b>Pharmacy Practice (T)731</b>	<b>CP731.1</b>	Know various drug distribution methods in a hospital and appreciate the pharmacy stores management and inventory control.
	<b>CP731.2</b>	Obtain medication history interview and counsel the patients.
	<b>CP731.3</b>	Detect and assess adverse drug reactions
	<b>CP731.4</b>	Interpret selected laboratory results of specific disease states.
	<b>CP731.5</b>	Appreciate the concept of Rational drug therapy.

<b>Novel Drug Delivery System (T)741</b>	<b>CP741.1</b>	Understand the need, concept, design and evaluation of various customized modified release dosage forms.
	<b>CP741.2</b>	Integrate the principles of drug release with the design of modified release dosage forms.
	<b>CP741.3</b>	Interpret the criteria for selection of drugs and polymers for the development of novel delivery systems drug delivery modules.
	<b>CP741.4</b>	Implement technological possibilities for design of various delivery modules of novel drug delivery systems.
<b>Formulation of technology of solid dosage forms P713</b>	<b>CP713.1</b>	Integrate the knowledge gained about formulation of solid dosage forms.
	<b>CP713.2</b>	Act as a legal expert in the selection of additives required in solid dosage forms.
	<b>CP713.3</b>	Function effectively as a formulation scientist for optimization of solid dosage forms.
	<b>CP713.4</b>	Design the facilities essential for manufacture of stable, effective & economic products (solid dosage forms).
<b>B.PHARM SEM-VIII</b>		
<b>Biostatistics and Research Methodology (T)811</b>	<b>CP811.1</b>	Identify the overall process of designing a research study from its inception to its report.
	<b>CP811.2</b>	Describe the appropriate statistical methods required for a particular research design.
	<b>CP811.3</b>	Choose the appropriate research design and explain the hypothesis testing.
	<b>CP811.4</b>	Discuss various methods of data processing and analysis.
<b>Social and Preventive Pharmacy (T)821</b>	<b>CP821.1</b>	Explain various dimensions of health, communicable and noncommunicable diseases
	<b>CP821.2</b>	Understand importance of hygiene and balanced diet in health
	<b>CP821.3</b>	Acquire high consciousness of current issues related to health and promote health education in society
	<b>CP821.4</b>	Have a critical way of thinking based on current healthcare development.
	<b>CP821.5</b>	Evaluate alternative ways of solving problems related to health and pharmaceutical issues
<b>Pharmaceutical Regulatory Science (T)841</b>	<b>CP841.1</b>	Explain the process of drug discovery, development and generic product development.
	<b>CP841.2</b>	Describe the regulatory approval process and registration procedures for API and drug products in various countries.
	<b>CP841.3</b>	Understand the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals and the registration of Indian drug product in overseas market.
	<b>CP841.4</b>	Elucidate the development of clinical trial protocols and concept of pharmacovigilance and its significance.
	<b>CP841.5</b>	Define guidance, guidelines, regulations, laws and acts, orange book, federal register, code of federal regulatory, purple book.
<b>Pharmacovigilance (T)851</b>	<b>CP851.1</b>	Understand the importance of drug safety monitoring and Scope of pharmacovigilance
	<b>CP851.2</b>	Execute the various terminologies, dictionaries, coding used in pharmacovigilance
	<b>CP851.3</b>	Detect new adverse drug reactions and their reporting systems with communication in pharmacovigilance
	<b>CP851.4</b>	Evaluate the drug safety in pediatrics, geriatrics, pregnancy, and lactation
	<b>CP851.5</b>	Understand the Pharmacovigilance Program of India (PvPI) and ICH, CIOMS Guidelines
<b>Cosmetic Science (T)891</b>	<b>CP891.1</b>	Design Cosmetics & Cosmoceuticals that are stable, effective & economical.
	<b>CP891.2</b>	Act as a legal expert in various pharmaceutical acts and laws pertaining to cosmetics.
	<b>CP891.3</b>	Function effectively as a Cosmetic manufacturer & Cosmetic Analyst.
	<b>CP891.4</b>	Explain the role of cosmetic excipients & building blocks in the formulation of cosmetics.

<b>Experimental Pharmacology (T)8101</b>	<b>CP8101.1</b>	Appreciate the applications of various commonly used laboratory animals.
	<b>CP8101.2</b>	Apply the regulations and ethical requirement for the usage of experimental animals.
	<b>CP8101.3</b>	Describe the various screening methods involved in the drug discovery process.
	<b>CP8101.4</b>	Understand and apply techniques of euthanasia used in experimental pharmacology.
	<b>CP8101.5</b>	Appreciate and demonstrate the importance of biostatistics and research methodology.