Sr. No.	Subject Code	Subject Name	Course Outcome Number	COURSE OUTCOMES (2023-24)
				Students will be able to
1	BP101T	Human Anatomy & Physiology (Theory)	CO1	Define and explain scope of anatomy and physiology and basic organization of human body.
			CO2	Explain structure, function and principles of cellular and tissue level of organisation.
			CO3	Discuss the anatomy and physiology of integumentary system, skeletal system and joints.
			CO4	Summarize composition and function of body fluid and blood and discuss anatomy and physiology of lymphatic system.
			CO5	Describe structure and function of Peripheral nervous system and special senses .
			CO6	Explain the anatomy and physiology of cardiovascular system .
2	BP102T	Pharmaceutical Analysis (Theory)	CO1	Explain the relevance & significance of Analytical Chemistry to Pharmaceutical Sciences.
			CO2	Describe principle, theory and applications of volumetric methods of analysis.
			CO3	Illustrate the gravimetric analytical method and its application for estimation of drugs.
			CO4	Summarize the principle, theory, instrumentation and applications of electrochemical methods of analysis.
3	BP103T	Pharmaceutics-I(Theory)	CO1	Explain the history and development of the pharmacy profession in India and classify various types of dosage forms.
			CO2	Explain the parts of a prescription, describe common prescription errors, and outline proper handling procedures.
			CO3	Calculate pediatric doses and perform pharmaceutical calculations using standard formulas and methods.
			CO4	Classify and prepare powders and liquid dosage forms, explaining formulation principles and stability aspects.
			CO5	Prepare and evaluate suppositories and semisolid dosage forms, including displacement value calculations.
			CO6	Identify and classify pharmaceutical incompatibilities and explain their types with examples.
			CO1	Differentiate various pharmacopoeias currently in use and explain the contents of official monographs in pharmacopoeias.

4	BP104T	Pharmaceutical Inorganic Chemistry(Theory)	CO2	Recognize impure and pure chemical compound and analyze their quality by official methods.
			CO3	Elaborate the concepts of Acid, bases and buffers in pharmaceutical systems and calculate tonicity of various solutions.
			CO4	Describe important functions of extracellular and intracellular ions in the body.
			CO5	Illustrate importance of various inorganic medicinal agents, their properties, method of preparation, storage, assay, uses and marketed formulations.
			CO6	Discuss about radiopharmaceuticals and explain storage conditions, precautions, and pharmaceutical applications.
5	BP105T	Communication Skills(Theory)	CO1	Explain the process of communication, its perspectives and various barriers.
			CO2	Describe different elements & styles of communication.
			CO3	Understand and develop basic listening and effective writing skills.
			CO4	Describe various interview skills.
			CO5	Acquire knowledge about presentation and leadership skills.
6	BP107P	Human Anatomy & Physiology(Practical)	CO1	Demonstrate the use of a compound microscope. Identify and analyze the histological characteristics of various tissues.
			CO2	Identify and differentiate axial and appendicular bones of human skeleton.
			CO3	Demonstrate the procedure for counting WBCs and RBCs using a hemocytometer and interpret the results accurately.
			CO4	Estimate bleeding time, clotting time, haemoglobin, and blood group, and interpret their physiological significance. (Level 3,4)
			CO5	Measure ESR, heart rate, pulse rate, and blood pressure, and interpret their clinical significance(Level 3,4)
			CO6	Describe the blood donation process and blood banking techniques during a blood bank visit.(Level 1)
7	BP108P	Pharmaceutical Analysis(Practical)	CO1	Understand and describe preparation of standard volumetric solutions and evaluate their strength.
			CO2	Evaluate quality of compounds by using different volumetric titration methods.
			CO3	Quantify strength of various acids using Potentiometer/ pH meter, conductometer.
			CO4	Demonstrate laboratory skillsto estimate the samples by using Abbe’s Refractometer..

8	BP109P	Pharmaceutics-I(Practical)	CO1	Describe the concepts underlying monophasic liquid dosage forms, develop suitable formulations, and evaluate their quality parameters.
			CO2	Outline the basic principles of biphasic liquid pharmaceutical systems, design formulations, and perform quality assessment.
			CO3	Interpret the foundational principles of pharmaceutical powders, prepare relevant formulations, and examine their quality attributes.
			CO4	Illustrate the principles of semisolid dosage forms, formulate them effectively, and assess their quality standards.
9	BP110	Pharmaceutical Inorganic Chemistry(Practical)	CO1	Identify impurities from pharmaceutical substances by performing limit tests
			CO2	Identify acidic and basic radicals from given inorganic unknown sample
			CO3	Analyse swelling power, acid neutralizing capacity of various Inorganic compounds.
			CO4	Synthesize pharmaceutical inorganic compounds and calculate their theoretical, practical and percentage yield.
10	BP111	Communication Skills(Practical)	CO1	Utilize the basic principles of communication and demonstrate effective communication skills.
			CO2	Apply the basics of phonetics and exhibit effective pronunciation.
			CO3	Utilize principles of effective writing skills.
			CO4	Implement the basic knowledge and develop effective interview and presentation skills.
11	BP201T	Human anatomy & physiology-II (Theory)	CO1	Describe basic fundamentals structural features of neurons, mechanism of neurotransmitters, anatomy and physiology of central nervous system .
			CO2	Summarize structure and functions of Digestive system and role of Energetics.
			CO3	Explain the anatomy and Physiology of Respiratory system.
			CO4	Explain the anatomy and physiology of Urinary systems and Endocrine system.
			CO5	Describe anatomy and physiology of male and female reproductive system and introduce the basic principles of genetics.
		Pharmaceutical	CO1	Understand the fundamental principles of organic chemistry including hybridization, bonding, resonance, hyperconjugation, inductive, steric, mesomeric and tautomeric effects.
			CO2	Apply the rules of nomenclature and classification to various organic compounds and analyze structural and stereoisomerism.

12	BP202T	Pharmaceutical Organic Chemistry-I (Theory)	CO3	Compare the reactivity, stability, and mechanisms of alkanes, alkenes, dienes, alkyl halides, and alcohols with suitable examples and applications.
			CO4	Explain the reactions, mechanisms, and applications of carbonyl compounds (aldehydes and ketones), including condensation and addition reactions.
			CO5	Evaluate the properties, acidity/basicity, qualitative tests, and uses of carboxylic acids, esters, amides, and aliphatic amines with emphasis on their pharmaceutical importance.
13	BP203T	Pharmaceutical Biochemistry (Theory)	CO1	Illustrate and write the fundamental concepts, chemistry and biochemical role of Biomolecules like carbohydrates, lipids, proteins and nucleic acids.
			CO2	Explain the concepts like bioenergetics, oxidative phosphorylation
			CO3	Outline various metabolic pathways, their integration and significance in physiological and pathological conditions. (level 2 understand)
			CO4	Understand genetic organization of mammalian genome, as well as processes like replication.
			CO5	Summarize catalytic role of enzymes, their therapeutic as well as diagnostic applications and importance of enzyme inhibitors.
14	BP204T	Pathophysiology (Theory)	CO1	Describe basic principle of cell injury and adaptation.
			CO2	Explain mechanisms involved in the process of inflammation.
			CO3	Differentiate pathophysiology of diseases associated with cardiovascular, respiratory, renal, endocrine, nervous and gastrointestinal system.
			CO4	Describe and differentiate pathophysiology of cancer, hematological diseases, sexually transmitted diseases, infectious diseases and diseases associated with bones and joints.
15	BP205T	Computer Applications in Pharmacy (Theory)	CO1	Understand various types of number systems.
			CO2	Explain concept of information systems and software.
			CO3	Understand various types of web technologies and databases.
			CO4	Learn and implement applications ofcomputers in pharmacy.
			CO5	Understandthe use of computers in bioinformatics and preclinical data analysis.
			CO1	Students will learn about natural resource, its importance and environmental impacts of human activities on natural resource

16	BP206T	Environmental Sciences(Theory)	CO2	Gain knowledge about the conservation of biodiversity and its importance
			CO3	Gain knowledge about environment and ecosystem.
			CO4	Aware students about problems of environmental pollution, its impact on human and ecosystem and control measures.
17	BP207P	Human anatomy & physiology-II (Practical)	CO1	Recall and record the platelet count, differential leukocyte count (DLC), Arneth index, and osmotic fragility of RBCs.
			CO2	Describe major human body systems using models, charts, and specimens.
			CO3	Demonstrate neurological tests, sensory functions, reflexes, feedback mechanisms, and blood count analysis
			CO4	Record body temperature, BMI, taste sensations, and respiratory volumes.
			CO5	Discuss family planning, pregnancy tests, histology of organs and gonads, and diagnostic practices in hospital and pathology laboratories.
18	BP208P	Pharmaceutical Organic Chemistry-I Practical	CO1	Demonstrate safety measures& explain preliminary test of organic compounds.
			CO2	Explain the Principle, procedure and utilize the knowledge in detection of hetero atoms.
			CO3	Analyse organic compounds using qualitative test.
			CO4	Describe the principle & procedure involved in the synthesis of various organic compounds.
			CO5	Construct different molecular models.
			CO6	Prepare different derivatives & confirm the unknown organic compound by determining physical constants.
19	BP209P	Biochemistry (Practical)	CO1	Apply laboratory skills to identify biomolecules by qualitative and quantitative tests.
			CO2	Determine various biomolecules in blood/serum.
			CO3	Identify abnormal constituents in urine.
			CO4	Examine enzymatic action of salivary amylase
20	BP210P	Computer Applications in	CO1	Design and create digital forms, questionnaires and web pages to collect and display health-related information.
			CO2	Utilize internet resources to retrieve medical data, including drugs and their adverse effects.
			CO3	Apply word processing tools to generate customized mailing labels and invoices.

20	BP210P	Pharmacy (Practical)	CO4	Construct a patient information database using MS Access for data entry, editing, and reporting. .
			CO5	Develop and analyze queries within MS Access to manage drug information and patient records.
			CO6	Export Access database objects (tables, queries, forms, reports) to web and XML formats for broader access and interoperability
21	BP301T	Pharmaceutical Organic Chemistry-II (Theory)	CO1	Understand the principles of reactivity/stability of compounds along with proper orientated products.
			CO2	Summarize the synthesis and chemistry of benzene and its derivatives ,phenols, aromatic amines, polynuclear hydrocarbons and cycloalkanes.
			CO3	Apply principles of stereochemistry to identify chiral compounds and justify the stabilities of stereoisomers.
			CO4	Explain the basic properties and quality of fats and oils.
22	BP302T	Physical Pharmaceutics-I (Theory)	CO1	Explain the importance of solubility and distribution phenomenon for formulation of stable dosage forms
			CO2	Describe states of matter and physicochemical properties of drug to formulate stable dosage forms.
			CO3	Explain and utilize the knowledge of interfacial phenomenon and surface tension for designing a stable pharmaceutical formulation
			CO4	Understand the principles of complexation/ protein binding and utilize the knowledge for calculation of drug release and stability constant.
			CO5	Understand the importance of pH, buffers and isotonic solutions in the formulation of stable dosage forms.
23	BP303T	Pharmaceutical Microbiology (Theory)	CO1	Explain the importance & applications of Pharmaceutical microbiology.
			CO2	Summarize the knowledge of different microorganisms and elaborate various sterilization techniques, their efficiency and application.
			CO3	Elaborate study of fungus and viruses, understand principles of antiseptic, disinfectants and evaluate sterility.
			CO4	Describe designing of aseptic area and principles and applications of microbial assay.
			CO5	Discuss types and factors affecting microbial spoilage, preservation of pharmaceutical products and applications of animal cell culture techniques.
			CO1	Understand basic principal and methodology of distillation, drying and evaporation
			CO2	Understand different material handling system such as size reduction and separation, mixing

24	BP304T	Pharmaceutical Engineering (Theory)	CO3	Elucidate fundamentals and facts about flow of fluids.
			CO4	Know the basic principle and equipments used in heat transfer
			CO5	Know different unit operations such as filtration and centrifugation
			CO6	Find out the efficiency of equipment based on mixing and distillation
25	BP305P	Pharmaceutical Organic Chemistry-II (Practical)	CO1	Demonstrate and explain techniques like recrystallization and steam distillation.
			CO2	Demonstrate laboratory skills to separate and identify the organic compounds from the given unknown binary organic compounds having different functional reactive groups.
			CO3	Aassess the quality of oils based on their saponification value.
			CO4	Synthesize organic compounds based on various reactions.
26	BP306P	Physical Pharmaceutics-I (Practical)	CO1	Understand and utilize the knowledge of solubility, CST and distribution phenomenon for formulation of stable dosage forms.
			CO2	Calculate the Surface tension, CMC and HLB value of surfactant and select a suitable surfactant for designing a stable formulation.
			CO3	Explain Henderson Hasselbalch equation and calculate the pKa value.
			CO4	Understand the phenomenon of adsorption and utilize the knowledge to calculate Freundlich-Langmuir constants.
			CO5	Understand the principles of complexation and utilize the knowledge for calculation of drug release and stability constant.
			CO6	Understand various physicochemical properties and determine refractive index.
27	BP307P	Pharmaceutical Microbiology (Practical)	CO1	Demonstrate the principle, construction and working of various instruments and perform their operations.
			CO2	Understand and utilize the skills required for maintaining strict aseptic conditionsfor inoculation of cultures.
			CO3	Explain the principles of different staining techniques and utilize the knowledge to intrpret morphology of bacteria.
			CO4	Demonstrate skills for isolation, cultivation and identification of microorganisms.
			CO5	Understand the principles and utilize the skills to perform microbial assay, sterility testing, and biochemical tests.

28	BP308P	Pharmaceutical Engineering (Practical)	CO1	To perform the experiment based on heat transfer including radiation
			CO2	To study the drying curves, find out moisture content and humidity of air
			CO3	To understand the factors affecting filtration, evaporation and crystallization.
			CO4	To verify laws of size reduction using ball mill and to evaluate size analysis by sieving
			CO5	To be familiar with different equipment used in various pharmaceutical processes
			CO6	To find out the efficiency of equipment based on mixing and distillation
29	BP401T	Pharmaceutical Organic Chemistry-III (Theory)	CO1	Explain stereoisomerism with chirality, racemic modification & its resolution and asymmetric synthesis with suitable examples.
			CO2	Elaborate conformational isomerism and stereospecific and stereoselective reactions.
			CO3	Describe and classify heterocyclic compounds with their synthesis, reactions and applications in medicinal chemistry.
			CO4	Explain various name reactions along with their mechanism & synthetic importance.
30	BP402T	Medicinal Chemistry-I Theory	CO1	Explain the history of medicinal chemistry, physicochemical properties of drugs in relation to Biological action and drug metabolism.
			CO2	Describe classification, nomenclature, Synthesis, structure activity relationship (SAR), mechanism of action, therapeutic uses of adrenergic agonists and antagonists.
			CO3	Explain classification, nomenclature, Synthesis, structure activity relationship (SAR), mechanism of action, therapeutic uses of Cholinergic agonists and antimuscarinic agents.
			CO4	Summarize classification, nomenclature, Synthesis, structure activity relationship (SAR), mechanism of action, therapeutic uses of drugs acting on central nervous system.
			CO5	Describe classification, nomenclature, Synthesis, structure activity relationship (SAR), mechanism of action, therapeutic uses of analgesics and Anti-inflammatory agents.
31	BP403T	Physical Pharmaceutics	CO1	Explain the properties of colloids and its applications in formulating stable colloidal systems.
			CO2	Explain the principles of rheology and utilize the knowledge to determine viscosity of formulations.
			CO3	Explain the physicochemical parameters for designing stable dispersed systems.

31	BP403T	Pharmaceutics-II (Theory)	CO4	Describe fundamental and derived properties of powders and utilize their applications in formulating stable dosage forms.
			CO5	Summarize the principles of the kinetics of drug reactions and predict storage and stability of the product.
32	BP404T	Pharmacology-I (Theory)	CO1	To understand the history, scope and basics of pharmacology.
			CO2	Describe the Pharmacokinetics, pharmacodynamics, adverse drug reaction, drug interaction and the process of drug discovery and development.
			CO3	Summarize the pharmacology of drugs acting on peripheral nervous system.
			CO4	Explain the concept of Neurohumoral transmission and discuss pharmacology of drugs acting on CNS
33	BP405T	Pharmacognosy and Phytochemistry -I (Theory)	CO1	Explain the techniques in the cultivation and production of crude drugs.
			CO2	Describe pharmacognostic account crude drugs.
			CO3	Illustrate the quality control parameters of herbal drugs.
			CO4	Describe the microscopic and morphological characteristics of crude drugs.
34	BP406P	Medicinal Chemistry-I Practical	CO1	Extend the knowledge of biological membrane and physicochemical properties, ferguson principle and stereo chemical aspects of drug action and Bioisosterism in the field of medicinal chemistry.
			CO2	Apply basic concept of drug receptor interaction in various drug actions.
			CO3	Relate between the chemical structure and biological activity of various categories of cholinergic agonists and antimuscarinic agents.
			CO4	Explain history and general aspects of the design & development of drugs including classification, nomenclature, structure activity relationship (SAR), mechanism of action, adverse effects, therapeutic uses, recent developments, and drug synthesis of various classes of adrenergic agonists and antagonists.
			CO5	Discuss history and general aspects of the design & development of drugs including classification, nomenclature, structure activity relationship (SAR), mechanism of action, adverse effects, therapeutic uses, recent developments, and drug synthesis of various classes of drugs like cardiovascular and diuretics.
			CO1	Calculate the particle size and size distribution of powders and understand the importance of f1 properties.

			CO2	Understand the principles of working of viscometers and calculate viscosity of formulations.
35	BP407P	Physical Pharmaceutics-II (Practical)	CO3	Understand importance of suspending agents for formulation of stable suspension.
			CO4	Determine the order of reaction and calculate the shelf life of the product.
			CO5	Understand and calculate the cloud point and Krafft point of the surfactant for formulation of stable dispersed systems.
			CO6	Explain the effect of addition of electrolytes on stability of formulated colloids.
36	BP408P	Pharmacology I (Practical)	CO1	Understand and utilize the knowledge of experimental pharmacology, common laboratory animals and instruments.
			CO2	Describe the CPCSEA guidelines, different routes of drugs administration and Common laboratory techniques used for animal studies.
			CO3	Explain and examine the effect of drugs on animals by simulated experiments and Videos
			CO4	Justify correlation of pharmacology with other bio medical sciences.
37	BP409P	Pharmacognosy and Phytochemistry -I (Practical)	CO1	Apply chemical and physical methods for identification and evaluation of crude drugs.
			CO2	Demonstrate the use of microscopic techniques for the assessment of pharmacognostic parameters.
			CO3	Use quantitative microscopy to evaluate diagnostic cellular features in crude drugs.
			CO4	Apply suitable techniques for standardization and quality control of crude drugs.
			CO5	Integrate various laboratory methods to assess the physicochemical properties of crude drugs.
38	BP501T	Medicinal Chemistry-I	CO1	Describe the general aspects of the design & development of drugs including classification, nomenclature, structure activity relationship (SAR), mechanism of action and synthesis of Antihistaminic agents , Gastric proton pump inhibitors and leukotriene antagonist.
			CO2	Memorize chemistry of prostaglandin and prostanoids.
			CO3	Explain classification, nomenclature, structure activity relationship (SAR), mechanism of action, adverse effects, drug synthesis , therapeutic uses of various classes like anti-anginal , antiarrtymic ,antihypertensive, antihyperlipidemic and diuretics.
			CO4	Elaborate the chemical structure and biological activity of various categories of steroidal drugs and antithyroidal agents.

			CO5	Discuss the general aspects of the design & development of drugs including classification, nomenclature, structure activity relationship (SAR), mechanism of action of and synthesis of oral hypoglycemic and local anaesthetics.
39	BP502T	Industrial Pharmacy-I Theory	CO1	Understand the concepts of dosage form design & formulation strategies.
			CO2	Explain tablets as a dosage for manufacture & evaluation, equipments, defects in tableting & remedies, coating, manufacture, evaluation and packaging of different liquid dosage forms.
			CO3	Explain capsules, types, additives, size selection, manufacturing equipments, defects & evaluation, and also formulation requirements, pelletization process, equipments for manufacture of pellets.
			CO4	Explain different types, preformulation, formulation , containers, evaluation of parenterals and ophthalmic preparations with production facilities and controls and aseptic processing.
			CO5	Explain formulation and preparation of different types of cosmetic products. materials ,factors influencing choice of containers, legal and official requirements, stability aspects and quality control tests of packaging materials.
40	BP503T	Pharmacology II – Theory	CO1	Discuss Pharmacotherapy of Cardiovascular disorders and Cardiovascular Shock.
			CO2	Explain Diuretics and anti-diuretics.
			CO3	Explain Autacoids and related drugs.
			CO4	Describe Drugs acting on endocrine system.
			CO5	Explain and demonstrate Bioassay.
41	BP504T	Pharmacognosy and Phytochemistry II– Theory	CO1	Explain purification & isolation techniques of synthesized compounds by column chromatography.
			CO2	Determine the dissociation constant of pharmaceutical compounds for understanding ionization behavior.
			CO3	Evaluate partition coefficient values of drug molecules using suitable purification techniques to predict biological distribution.
			CO4	Synthesize medicinal drugs and theirs intermediates.
			CO5	Apply recrystalization, thin layer chromatography, column chromatography technique for purification of synthesized compounds.
			CO1	Describe the significance of pharmaceutical laws in India and utilize the knowledge in regulatory affairs.

			CO2	Understandthe basic principles, purpose and utilization of various Pharmacy Acts.
42	BP505T	Pharmaceutical Jurisprudence – Theory	CO3	Explain and utilize the knowledge related to manufacture, distribution and sale of drugs in India.
			CO4	Comprehend and utilize the knowledge related to regulatory aspects required for safety, effectiveness and quality of medicinal products.
			CO5	Recall and apply code of ethics during the pharmaceutical practice
			CO1	State the correct use of various equipments in pharmaceutics laboratory relevant to tablets, capsules, injections and ophthalmic preparations.
			CO2	Design and carry out formulation of granules, tablets, capsules and evaluation.
43	BP506P	Industrial Pharmacy-I Practical	CO3	Design and carry out formulation of injectable preparations.
			CO4	Design and carry out formulation of ophthalmic preparations and evaluation.
			CO5	Design and carry out formulation of cosmetic preparations and evaluation.
			CO6	Carry out evaluation of Glass containers.
			CO1	Discuss physiological salt solutions, drug solution and use of molar solution in various animal experiments.
			CO2	Demonstrate effect of various drugs on heart rate, blood pressure in heart and on rabbit eye by using software.
			CO3	Demonstrate bioassay of matching, graphical, three point and four point method and DRC, PA2, PD2 Value using suitable isolated tissue preparations.
44	BP507P	Pharmacology II Practical	CO4	Demonstrate Anti-inflammatory activity of drugs using carrageenan induced paw-edema model.
			CO5	Demonstrate effect of spasmogens and spasmolytics using rabbit jejunum.
			CO6	Demonstrate Analgesic activity using hotplate method.
			CO7	Demonstrate Anti allergic activity by mast cell stabilization assay.
			CO8	Demonstrate Clinical Case study and dose calculation.
			CO1	Students are able to discuss the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents.
45	BP508P	Pharmacognosy and	CO2	Students are able to discuss the production of Phytoconstituents /herbal formulation.

45	BP508P	Phytochemistry II Practical	CO3	Students are able to explain the metabolic pathways in formation of secondary metabolites and application of biogenetic studies.
			CO4	Students are able to demonstrate isolation and identification of phytoconstituent.
46	BP601T	Medicinal Chemistry-III (Theory)	CO1	Explain the history, development, and chemistry of antibiotics and their classification, synthesis, and mechanism of action.
			CO2	Analyze the SAR and chemical features of various antitubercular agents and antiviral.
			CO3	Describe the classification, mechanism of action, chemical structure, structure-activity relationship (SAR), and therapeutic uses of antineoplastic agents.
			CO4	Discuss the synthesis and therapeutic applications of drugs used in the treatment of infectious diseases, including fungal, protozoal, and bacterial infections.
			CO5	Explain the various approaches used in drug design.
47	BP602T	Pharmacology III (Theory)	CO1	Describe Pharmacology of drugs acting on Respiratory system.
			CO2	Describe Pharmacology of drugs acting on the Gastrointestinal Tract.
			CO3	Explain Chemotherapy.
			CO4	Describe Immunopharmacology.
			CO5	Explain Protein drugs, monoclonal antibodies, target drugs to antigen, biosimilars.
			CO6	Comprehend and apply Principles of toxicology.
48	BP603T	Herbal Drug Technology (Theory)	CO1	Outline the process cultivation, collection and processing of herbal raw materials.
			CO2	Explain Indian system of medicine and their formulation aspects.
			CO3	Summarize formulation aspects of herbal cosmetics, nutraceuticals and herb-drug & food interaction.
			CO4	Utilize GMP, WHO and ICH guidelines for evaluation of herbal drugs.
49	BP604T	Biopharmaceutics and Pharmacokinetics (Theory)	CO1	Apply the concepts of biopharmaceutics and relate different factors, types, mechanisms of absorption, distribution.
			CO2	Understand different factors, types and predict mechanisms of elimination.
			CO3	Classify the clinical significance of bioavailability, bioequivalence.
			CO4	Describe non compartment model

			CO5	Justify the importance of compartment model in the study of pharmacokinetics.
			CO6	Interpret the non- linear pharmacokinetics along with its significance.
50	BP605T	Pharmaceutical Biotechnology (Theory)	CO1	Understand scope of Pharmaceutical Biotechnology, enzyme immobilization techniques and its applications.
			CO2	Explain the techniques and applications of genetic engineering in production of pharmaceuticals.
			CO3	Elaborate different types and preparations of immunizing agents in pharmaceutical industries.
			CO4	Explain different types of blotting techniques, gene transfer methods, applications of biotransformation and different types of mutations.
			CO5	Explain the use of microorganisms in fermentation technology and study of different blood products.
51	BP606T	Pharmaceutical Quality Assurance (Theory)	CO1	Explain various aspects of Quality Assurance, Quality Control, Total Quality Management and quality certifications to pharmaceutical industry.
			CO2	Explain concept of organization, personnel, premises, equipments and raw materials in Pharmaceutical Industry.
			CO3	Understand and utilize the principles of Good Laboratory Practices, documentation process, Quality Control tests for Pharmaceuticals.
			CO4	Describe the handling of complaints and recalls of pharmaceuticals.
			CO5	Discuss the principles involved in Calibration and validation of pharmaceutical instruments and processes as well as principles of warehousing.
52	BP607P	Medicinal Chemistry-III (Practical)	CO1	Synthesize drug intermediates and recrystallization of compounds.
			CO2	Synthesize medicinally important compounds by microwave synthesis.
			CO3	Determine physicochemical properties such as Log P, Clog P, MR of organic compounds.
			CO4	Use drug design software for hydrogen bond donor and acceptor class of drugs.
53	BP608P	Pharmacology III (Practical)	CO1	Explain effect of drugs on GIT.
			CO2	Explain estimation of serum biochemical parameters by using semi-autoanalyser and effect of saline purgatives on frog intestine.
			CO3	Demonstrate hypoglycemic effect and test of pyrogens on rabbit.
			CO4	Demonstrate acute skin irritation and eye irritation test.

			CO5	Explain various biostatistics methods.
			CO6	Explain three point and four point bioassay.
54	BP609P	Herbal Drug Technology (Practical)	CO1	Evaluate excipients of natural origin.
			CO2	Assess preliminary phytochemical screening of crude drugs.
			CO3	Demonstrate preparation & standardization of extract in cosmetic formulations.
			CO4	Demonstrate preparation & standardization of extract in ayurvedic formulations.
			CO5	Determine aldehyde, phenol & alkaloid content of herbal products.
55	BP701T	Instrumental Methods of Analysis (Theory)	CO1	Understand and apply the principle, instrumentation, techniques involved in and applications of UV-spectroscopy and Fluorimetry techniques.
			CO2	Explain and use the principle, instrumentation, techniques involved in and applications of IR Spectroscopy, atomic spectroscopy and Nephaloturbidimetry.
			CO3	Discuss the principle, methodologies involved in and applications of conventional chromatographic techniques (Column, Paper, Thin layer chromatography).
			CO4	Determine pharmaceuticals using principle, instrumentation, techniques involved in and applications of HPLC, HPTLC, Gas Chromatography.
			CO5	Apply the principle, instrumentation, techniques involved in and applications of Ion exchange, Gel, and Affinity chromatography.
56	BP702T	Industrial Pharmacy II (Theory)	CO1	Describe the process of pilot plant scale up and SUPAC guidelines of various pharmaceutical dosage forms.
			CO2	Demonstrate the practice and process of technology transfer as per official guidelines from lab to commercial scale.
			CO3	Describe the regulatory requirements and documentation for drug approval process.
			CO4	Summarize different laws, acts and certifications that regulate approval of new drugs in Indian pharmaceutical industry.
			CO5	Describe the certification process, ISO standards with GLP and accreditation like NABL for technical competence and quality management systems.
			CO1	Describe hospital and hospital pharmacy organization and community pharmacy.

			CO2	Understand and develop drug distribution system in a hospital, hospital formulary, and management of community pharmacy.
57	BP703T	Pharmacy Practice (Theory)	CO3	Explain and utilize knowledge of pharmacy and therapeutic committee, drug information services, patient counselling, education and training program in the hospital.
			CO4	Use knowledge of budget preparation, drug store management and inventory control, implementation of clinical pharmacy, along with OTC medication sales.
			CO5	Apply investigational use of drugs and interpret clinical laboratory tests.
58	BP704T	Novel Drug Delivery System (Theory)	CO1	Define controlled release concepts and explain drug/polymer selection based on release mechanisms.
			CO2	Describe and differentiate microencapsulation, mucosal, and implantable drug delivery systems and analyze formulation parameters.
			CO3	Explain permeation and formulation of transdermal, gastroretentive, and nasopulmonary systems and evaluate their effectiveness.
			CO4	Discuss and classify targeted drug delivery carriers and justify their selection for specific therapies.
			CO5	Describe formulation strategies for ocular and intrauterine systems and summarize their clinical significance and design aspects.
59	BP705P	Instrumental Methods of Analysis (Practical)	CO1	Understand and utilize the knowledge of weights, measures and pharmacopeial guidelines for testing of pharmaceuticals.
			CO2	Analyze data of pharmaceuticals using spectrometric and photometric instruments.
			CO3	Identify, separate and analyze pharmaceuticals using chromatographic instruments.
			CO4	Analyze, interpret and report data of pharmaceuticals using FTIR & HPLC.
60	BP706PS	Practice School	CO1	Implement the knowledge and skills acquired beyond syllabus in practical or realistic way.
			CO2	Enhance co-operative learning among students.
			CO3	Develop problem-solving skills.
			CO4	Encourage communication and soft skills of students.
			CO5	Improve attitude and discipline in students.
			CO6	Promote students' employability.

61	BP801T	Biostatistics and Research Methodology (Theory)	CO1	Explain various statistical techniques & its calculations like measures of central tendency, measures of dispersion & Correlation
			CO2	Demonstrate calculation of Regression, probability & parametric test.
			CO3	Explain Non Parametric tests, research process, graphical presentations &designing the methodology for research.
			CO4	Explain Regression modeling, practical components of Industrial and clinical trials
			CO5	Explain Statistical Analysis Using Excel, SPSS, MINITAB®, DESIGN OF EXPERIMENTS, R - Online Statistical Software's to Industrial and Clinical trial approach
			CO6	Explain experiments using factorial design & response surface methodology.
62	BP8011ET	Advanced Instrumental Techniques (Theory)	CO1	Understand the principle instrumentation, techniques of NMR and Mass Spectroscopy and illustrate simple organic structures.
			CO2	Determine purity of organic compounds using Thermal Methods of Analysis (TG, DTA, DSC).
			CO3	Apply the principle, instrumentation, techniques and applications of Electrophoresis and X-ray Diffraction.
			CO4	Understand the calibration of Electronic balance, UV-Visible and IR spectrophotometer, Fluorimeter, and HPLC.
			CO5	Utilize the principle, instrumentation, techniques and applications of radioimmune assay and extraction techniques.
			CO6	Describe the introduction and techniques involved in Hyphenated Techniques (LC-MS, GC-MS, HPTLC-MS, MS/MS).
63	BP802T	Social and Preventive Pharmacy (Theory)	CO1	Describe the concept of social and health education.
			CO2	Explain principles of prevention and control of various diseases.
			CO3	Summarize information about various National health programmes, their objectives, functioning and outcomes.
			CO4	Examine alternative ways of solving problems related to social health and hygiene.
			CO5	Use the knowledge of community services in rural, urban and school health.
			CO1	Explain the history of cosmetics and differentiate between cosmetics and cosmeceutical agents.

64	BP809ET	Cosmetic Science (Theory)	CO2	Describe the regulatory requirements of cosmetics.
			CO3	Understand the concepts of cosmetics, anatomy of skin and hair, and general excipients used in cosmetics.
			CO4	Discuss formulation principles of skin care, hair care, oral care products, sun protection and herbal products.
			CO5	Describe various analytical tests as per BIS standards for evaluation of cosmetic products.
65	BP813PW	Project Work	CO1	Identify and define a research problem relevant to pharmaceutical sciences using literature survey and background study.
			CO2	Formulate objectives, hypotheses, and experimental strategies to address the identified research problem.
			CO3	Design and execute experiments using appropriate scientific methods, tools, and instruments in a laboratory setting.
			CO4	Analyze and interpret experimental data using statistical and scientific reasoning to draw valid conclusions.
			CO5	Demonstrate the ability to work independently or as part of a team with professional ethics, time management, and leadership.
			CO6	Communicate research findings effectively through oral presentations and project reports following scientific guidelines.