| S. No. | NAME OF THE PROGRAMME | NAME OF THE COURSE | COURSE CODE | COURSE OBJECTIVE | COURSE OUTCOMES |
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| 1 | B. Pharmacy | Human Anatomy and Physiology -I Theory | BP101T | 1. To understand the behaviour of human body in diseased state. 2. To explain the role of feedback mechanisms. 3. To recognize the systems of human body. 4. To relate the functioning of different systems. 5. To understand the coordination of human body systems. | 1. Student can then correlate and identify the morphological, structural and functional altercations in the human during a diseased state<br>2. Students can understand that how body works within itself to maintain its internal environment through various positive and negative feedback mechanisms.<br>3. Students will have knowledge about the structural organisation of various systems of the human body<br>4. Student will be well acquainted with the physiologic basis of the working of various special senses in coordination with brain.<br>5. Students can then comprehend the coordination during functioning of different systems of the body. |
| 2 | B. Pharmacy | Pharmaceutical Analysis-I Theory | BP102T | 1. To define the basics of analytical processes.<br>2. To analyse the expression of solution strength.<br>3. To understand errors and remedial strategies.<br>4. To organize the study protocol for analysis of pharmaceuticals. | 1.Students will develop understanding in fundamentals of analytical chemistry.<br>2. Students will be aware of solutions of different strengths. 3.Student will be well familiar to different sources of errors in solution preparation and assay.<br>4.Students can decisively choose the analytical techniques to perform the estimation of different category drugs/chemical. |
| 3 | B. Pharmacy | Pharmaceutics I Theory | BP103T | 1. To recognize historical perspectives of pharmacopoeia development.<br>2. To understand the diverse dosage forms.<br>3. To apply the learnings for preparation of dosage forms.<br>4. To execute the dose calculation for the patient. | 1. Student will comprehend the history of pharmacy, pharmacopoeias of various countries and role of pharmacist.<br>2. Students will be able to study different dosage forms, route of administration, pharmaceutical incompatibilities and pharmaceutical calculations<br>3. Students will demonstrate knowledge of various dosage forms, their composition, preparation and evaluation<br>4. Student can apply knowledge of pharmaceutical calculations and dose calculations as per the need of patient |
| 4 | B. Pharmacy | Pharmaceutical Inorganic Chemistry Theory | BP104T | 1. To explain the causes of impurities in pharmaceuticals.<br>2. To develop knowledge of monographs in official books.<br>3. To appreciate use of radiopharmaceuticals in diagnosis and therapeutics. 4. To understand and exemplify the acids, bases and buffers. 5. To recognize the need for physiological salt balance. | 1. Students can estimate the different type of inorganic impurities in pharmaceuticals<br>2.Students can understand monograph of various inorganic compounds used as pharmaceuticals<br>3.Students can decisively use radioisotopes in the diagnosis and treatment of different ailments<br>4.Students will be well acquainted with basic concepts about acid, bases and buffers and their biological utility<br>5.Students can use the major intracellular and extracellular electrolytes for physiological acid base balance |
| 5 | B. Pharmacy | Communication Skills Theory | BP105T | 1. To create skill set in professional English. 2. To create literature awareness among students.<br>3. To apply the communication skills in professional environment. | 1.Students will learn to construct basic and intermediate skills in English language<br>2.Comprehension skills, presentation skills, group discussion skills will be enhanced and literature sensibility will be developed in students.<br>3.Students will imbibe the aesthetic of communicating in English and will have interest for the lifelong learning of the English language.<br>4.Students will acquire confidence in communicating in English and will have interest for the life-long learning of the English language.<br>5.Students will enhance their phonetic competence, comprehension skills, presentation skills, group discussion skills etc.<br>6.Students will improve the language skills i.e. Listening Skills, Speaking Skills, Reading Skills and Writing Skills (LSRW) |
| 6 | B. Pharmacy | Remedial Biology Theory | BP106RB T | 1. To recall structure and functions of a cell.<br>2. To recognize the different classification systems.<br>3. To understand the fundamentals of plant and animal cells. | 1.Student will exhibit basic understanding of cell and cell structure.<br>2. Student will understand diversity of living system and classification of living organism<br>3.Student will develop basic understanding of various tissues of plants and animals |

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| 7 | B. Pharmacy | Remedial Mathematics Theory | BP106RM T | 1. To understand the basics of mathematics.<br>2. To implement the learnings to the relevant domain.<br>3. To infer and execute about functions and differential equations.<br>4. To critique the integrals via different techniques.<br>5. To recognize the importance of analytical geometry. | 1.Students will be able to use Mathematics concepts as logarithms, fractions, limits in solving real world problems<br>2.Students will learn to apply matrices and operations on matrices in pharmacokinetics.<br>3.Students will be able to interpret derivative of a function numerically and differential equation qualitatively.<br>4.Students will be able to evaluate indefinite and definite integrals by appropriate integration techniques.<br>5.Students will be able to understand rules of analytical geometry and their applications in pharmacokinetics and research |
| 8 | B. Pharmacy | Human Anatomy and Physiology -I Practical | BP107P | 1. To understand the applications of microscope.<br>2. To demonstrate the bones of human body.<br>3. To examine the blood composition.<br>4. To execute different biochemical investigations. | 1.Student will be able to interpret the microscopic details of various tissues of the body.<br>2.Students will be able to identify various bones and their importance in providing support and frame work to the body.<br>3.Students will be able to analyse blood for its normal cellular composition; student can perform complete hemogram estimation.<br>4.Students will be able to estimate basic important investigatory tests like blood pressure, heart rate, pulse rate, blood group etc. |
| 9 | B. Pharmacy | Pharmaceutical Analysis-I Practical | BP108P | 1. To understand the basics of analytical experimentation.<br>2. To execute the preparation of solutions.<br>3. To operate volumetric and electrochemical studies.<br>4. To distinguish between analytical technique for estimation of pharmaceuticals. | 1.Students will develop skills in fundamentals of analytical chemistry.<br>2.Students will be well able to prepare different chemicals required for drug analysis.<br>3.Students can demonstrate various skills of volumetric and electrochemical analysis.<br>4.Students can decisively choose the analytical techniques to perform the estimation of different category drugs/chemical. |
| 10 | B. Pharmacy | Pharmaceutics I Practical | BP109P | 1. To demonstrate formulation of dosage forms.<br>2. To execute the different calculations.<br>3. To solve the pharmaceutical incompatibilities. | 1.Students will develop skills for preparation of various dosage forms, labelling and proper storage.<br>2.Students will be well acquainted with various pharmaceutical calculations<br>3.Students can identify the physical and chemical Incompatibilities |
| 11 | B. Pharmacy | Pharmaceutical Inorganic Chemistry Practical | BP110P | 1. To understand the basics of limit tests for impurity determination.<br>2. To demonstrate the tests for impurity identification.<br>3. To recognize use of inorganic materials as medicines.<br>4. To create and plan experiments involving data handling.<br>5. To translate the ethics in laboratory experimentation. | 1.Students will be well acquainted with the principles of limit tests.<br>2.Students will understand the sources of impurities, their identification test and can apply this knowledge in quality control of pharmaceuticals<br>3.Students will acquire knowledge of inorganic compounds that are used as medicine<br>4.Students will be able to design and carrying out the experiment along with data interpretation.<br>5.Students will learn and practice the ethics for carrying out the experiments. |
| 12 | B. Pharmacy | Communication Skills-Practical | BP111P | 1. To execute the profession communication. 2. To operate at improved level of soft skills during interview.<br>3. To understand the significance of diction and demeanour on public appearances. | 1.Students will learn the basic art of communication<br>2.Students will be able to exercise appropriate interview skills will be developed in students<br>3.Students will learn to present themselves in a better way on any public platform<br>4.Students will learn how to write effectively in English<br>5.Students will be able to exercise appropriate presentation skills will be developed in students<br>6.Students will develop phonetic competence, comprehension skills, presentation skills, group discussion skills etc. |

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| 13 | B. Pharmacy | Remedial Biology Practical | BP112RB P | 1. To operate tissue manoeuvre and studies on microscope .<br>2. To distinguish the tissue types.<br>3. To demonstrate experimentation on human blood and respiratory system.<br>4. To detect parts of plants micro as well well as macroscopically. | 1.Students will demonstrate skills of tissue section preparation, mounting and microscopic studies.<br>2.Students will be able to identify the various tissue (Human/Plant origin)<br>3.Students will be able to analyse blood group, pressure and respiratory parameters<br>4.Students will be able to identify various plant parts and their modification |
| 14 | B. Pharmacy | Human Anatomy and Physiology -II Theory | BP201T | 1. To understand the tissue system in human body. 2. To explain the housekeeping and skeletal functions. 3. To express the cardiovascular and allied system. | 1.Students would be able to explain the fundamentals of elementary tissues of human body<br>2.Students would be able to describe the skeletal system and haemopoietic system<br>3.Students would be able to demonstrate lymphatic system and cardiovascular system. |
| 15 | B. Pharmacy | Pharmaceutical Organic Chemistry-I Theory | BP202T | 1.To understand the fundamentals of atomic structure and its functionalities.<br>2.To identify and apply the knowledge of chemical reactions.<br>3.To infer the rules of IUPAC nomenclature and stability. | 1.Students would be able to infer the fundamentals of atomic structure, bond, hybridization and addition compounds.<br>2.Students would be able to identify and apply the knowledge of reagents, reactions and electron displacement effects<br>3.Students would be able to infer the rules of IUPAC nomenclature and explain the Structure, occurrence and stability of ions and free radicals. |
| 16 | B. Pharmacy | Biochemistry-Theory | BP203T | 1.To understand the basics of bichemical entities.<br>2.To demonstrate the knowledge metabolism of biochemicals. | 1.Students would be able to demonstrate understanding of biochemical organization of the cell, transport process and describe enzymes and isoenzymes in the field of clinical diagnosis. metals and vitamins as co-enzymes and their significance in human body.<br>2.Students would be able to explain the metabolism of carbohydrate, lipid, protein and their role in our body<br>Analyze carbohydrate, lipid, protein, the generation of ATP and isolate RNA and DNA from different sources. |
| 17 | B. Pharmacy | Pathophysiology-Theory | BP204T | 1.To infer the cause and effect relationship.<br>2.To understand regulator's recommendations.<br>3.To apprehend the end point and prophylaxis of diseases. | 1.Students would be able to relate the symptoms with diseases and treatment.<br>2.Students would be able to learn about the WHO guidelines for various reference values.<br>3.Students would be able to understand severity and precautionary measures of any diseases |
| 18 | B. Pharmacy | Computer Applications in Pharmacy Theory | BP205T | 1.To memorize the basics of computers.<br>2. To execute the functions performed by computer programmes.<br>3. To recognize the role of computer accessories. | 1. Students will be able to recall and infer the fundamentals of Computer, its components, structure and types.<br>2. Students will be able to operate basic Microsoft office packages such as MS-Word, Excel and Power point<br>3.Students will be able to identify and apply the knowledge of internet, graphics and multimedia |
| 19 | B. Pharmacy | Environmental Sciences-Theory | BP206T | 1.To relate the basics of environmental studies.<br>2. To deduce the interplay of development and its consequences. | 1.Students will be able to understand about environmental conditions and ecosystem.<br>2. Students will be able to identify environmental hazards and pollution concerns |
| 20 | B. Pharmacy | Human Anatomy and Physiology -II Practical | BP207P | 1.To demonstrate the tissue systems and functions thereof.<br>2. To execute the experiments on human body systems. | 1.Students will be able to explain the fundamentals of elementary tissues of human body<br>2.Students will be able to discuss the skeletal system and haemopoietic system<br>3.Students will be able to demonstrate lymphatic system and cardiovascular system. |

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| 21 | B. Pharmacy | Pharmaceutical Organic Chemistry-I Practical | BP208P | 1.To recognize the basics of equipment's and safety precautions.<br>2. To operate identification and synthesis of organic substances.<br>3. To appraise about reaction mechanisms. | 1.Students will be able to explain correct use of various equipment's and safety measures in pharmaceutical chemistry laboratory<br>2.Students will be able to understand the analysis of organic compounds qualitatively and synthesis of derivatives.<br>3. Students will be able to understand the synthesis of different organic compounds along with reaction mechanism |
| 22 | B. Pharmacy | Biochemistry-Practical | BP209P | 1.To recognize the basics of equipment's and safety precautions.<br>2. To operate identification and synthesis of organic substances.<br>3. To appraise about reaction mechanisms. | 1.Students will be able to detect and identify proteins, amino acids and carbohydrates by various qualitative as well as quantitative tests<br>2. Students will be able to separate, identify and characterize proteins from various samples<br>3.Students will be able to demonstrate action of salivary amylase on starch and effect of various parameters on it<br>4.Students will be able to execute biochemical investigation of creatinine, sugar and other components |
| 23 | B. Pharmacy | Computer Applications in Pharmacy Practical | BP210P | 1.To understand and execute function related to computers.<br>2.To demonstrate applications of Microsoft packages.<br>3.To operate the media tools. | 1..Students will be able to recall and infer the fundamentals of Computer, its components, structure and types.<br>2.Students will be able to operate basic Microsoft office packages such as MS-Word, Excel and Power point<br>3..Students will be able to identify and apply the knowledge of Internet, Graphics and Multimedia. |
| 24 | B. Pharmacy | Pharmaceutical Organic Chemistry II-Theory | BP301T | 1.To understand the basics of organic reactions.<br>2.To infer reactivity of organic substances.<br>3.To appraise about reaction mechanisms. 4. To elucidate chemical structures. | 1.Student will have basic knowledge regarding general methods of preparation of organic compounds.<br>2.Student will be able to elucidate reactivity of organic compounds.<br>3.Student will be able to explain mechanisms and orientation of chemical reactions<br>4.Student will be able to write structure, name and the type of isomerism of the organic compound<br>5.Student will have knowledge about uses of organic compounds. |
| 25 | B. Pharmacy | Physical Pharmaceutics I Theory | BP302T | 1.To demonstrate solubility analysis of pharmaceuticals.<br>2.To operate stability studies.<br>3.To appraise about solid state characterization.<br>4.To execute experimentation based on pH and physicochemical properties for development of formulations. | 1.Students will learn to correlate solubility of solids in liquids, liquids in liquids and gases in liquids to selection of suitable dosage form for solute.<br>2.Students will have knowledge of critical temperature, latent heat, vapor pressure to predict product storage conditions.<br>3.Students will learn the importance of different forms as crystalline, amorphous and polymorph in solubility, stability and dissolution studies.<br>4.Students will be able to understand importance of particle size and flow properties of powder sample in formulation, physical stability and pharmacological response of tablets, capsule, powders, suspensions, emulsions etc.<br>5.Students will learn about in-vitro complexation behaviour of drugs that will help to predict their in-vivo behaviour and release mechanism.<br>6.Students will gain knowledge about pH and importance of buffers in pharmaceutical systems as ophthalmic preparations etc. |

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| 26 | B. Pharmacy | Pharmaceutical Microbiology Theory | BP303T | 1.To distinguish microbe types and execute processing.<br>2. To appraise about sterilization.<br>3. To appraise about solid state characterization.<br>4.To execute experimentation based on pH and physicochemical properties for development of formulations. | 1.Students will learn to compare and contrast the characteristics for various microbes (bacteria, viruses and fungi etc) with regards to identification, cultivation and preservation<br>2.Students will learn different methods of sterilization, their efficiencies, importance and equipment's used in sterilization<br>3.Students will gain knowledge about sterility testing, aseptic area management, clean area classification, laminar air flow etc needed for preparation of ophthalmic, parenteral etc.<br>4.Students will gain knowledge about different microbiological assays and methods of standardizing antibiotics, vitamins and amino acids<br>5.Students will learn about source, contamination and prevention of microbial spoilage<br>6.Students will learn cell culture methods (plant and animal) and their role in pharmaceutical research |
| 27 | B. Pharmacy | Pharmaceutical Engineering-Theory | BP304T | 1.To understand about size reduction equipment's.<br>2. To appraise about principles of unit operation.<br>3. To explain the material used for plant construction. 4.To decide upon appropriate machine for carrying out process. | 1.Students will learn about various size reduction mills, size separators and mixers used for pharmaceuticals<br>2.Students will learn about laws governing flow of fluids, heat transfer, drying, distillation, filtration and centrifugation<br>3.Students will gain knowledge about crystallization techniques, evaporators, dryers, distillers, filtration equipment's and centrifuges<br>4.Students will gain knowledge about pharmaceutical plant construction, materials required, hazards in operation of plant etc<br>5.Students will learn selecting suitable equipment for drying, evaporating, filtering and centrifugation process |
| 28 | B. Pharmacy | Pharmaceutical Organic Chemistry II-Practical | BP305P | 1.To understand basics of organic chemistry.<br>2. To execute purification and determination of key parameters. | 1.The student will be able to prepare organic compounds<br>2.The student will be able to purify organic compouds by experimental techniques such as recrystallization<br>3.The student will be able to account for determination of oil values such as Acid value, Saponification value and<br>Iodine value |
| 29 | B. Pharmacy | Physical Pharmaceutics I Practical | BP306P | 1.To understand about handling of laboratory equipment's.<br>2.To execute physical experimentation on bulk substances. | 1.Students will be able to handle separating funnel, separate immiscible liquids and predict the nature of substance whether hydrophilic or hydrophobic.<br>2. Students will be able to determine particle size and flow nature of powder sample by different methods and plot graphs by statistical analysing particle size distribution.<br>3. Students will be able to calculate solubility and stability of drugs to predict the optimal dosage form |
| 30 | B. Pharmacy | Pharmaceutical Microbiology Practical | BP307P | 1.To operate identification of microps.<br>2.To execute sterilization equipment's. | 1.Students will be able to identify microorganisms by staining methods, subculture bacteria and fungus and determine motility of microorganisms.<br>2. Students will be able to sterilize glassware, media with help of various sterilization equipment's and perform sterility testing on pharmaceutical products<br>3.Students will be able to perform microbiological assay of antibiotics |

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| 31 | B. Pharmacy | Pharmaceutical Engineering-Practical | BP309P | 1.To understand basics of unit operation.<br>2.To execute variety of unit processes. | 1.Students will be able to calculate efficiency of steam distillation<br>2.Students will be able to determine moisture content, humidity, loss on drying of pharmaceuticals<br>3.Students will be able to construct drying curves, size frequency curves, use of humidity chart<br>4.Students will be able to use size reduction mills and perform size analysis by sieving techniques |
| 32 | B. Pharmacy | Pharmaceutical Organic Chemistry III – Theory | BP401T | 1.To explain the molecular structure.<br>2.To asses reaction mechanism. | 1.Understand various molecular representations and their interconversions<br>2.Student can explain mechanism and applications of rearrangement of electron deficient & electron rich systems<br>3.Student demonstrate understanding of chemistry of amino acids, methods of preparation and underlying concepts like isoelectric point |
| 33 | B. Pharmacy | Medicinal Chemistry I – Theory | BP402T | 1.To understand the basics of medicinal chemistry.<br>2.To discuss the medicinal substances in therapeutics | 1.Student will be able to write basic principles of medicinal chemistry and develop a brief concept on QSAR.<br>2.Employ the fundamental principles of cholinergic and adrenergic system of drugs<br>3.Employ the subject knowledge of neuromuscular blockers, local anaesthetics and the drugs affecting uterine motility. |
| 34 | B. Pharmacy | Physical Pharmaceutics II – Theory | BP403T | 1.To understand the basics of reaction kinetics.<br>2.To execute stability studies. 3.To demonstrate rheological behaviour of liquids with emphasis on surfactants. | 1.Students will learn the application of reaction kinetics to pharmaceutical preparations, degradation and stabilization of medicinal agents<br>2.Students will have knowledge of ICH guidelines for establishing stability requirements of medicinal products and accelerated stability studies for calculating expiration date<br>3.Students will learn rheology and behaviour of fluids under stress and apply the knowledge to pharmaceutical preparations as suspensions, ointments<br>4.Students will have knowledge of surface and interfacial tensions, equipment's used for surface tension determination<br>5.Students will learn HLB classification useful in selection of emulsifying agent, solubilising agent, wetting agents in pharmaceutical preparations<br>6.Students will have knowledge of preparation and stability of coarse and colloidal dispersions |
| 35 | B. Pharmacy | Pharmacology I – Theory | BP404T | 1.To understand the basics of pharmacology.<br>2.To discuss pathophysiology of disease. 3.To demonstrate action of drugs on human body. | 1.Describe the pharmacology of drugs acting on central nervous system<br>2.Employ the basic principles of cell injury and adaptations and pathophysiology of common diseases and its treatment<br>3.Describe the pharmacology of drugs acting on peripheral nervous system.<br>4.Employ drugs used in management of pain |
| 36 | B. Pharmacy | Pharmacognosy and Phytochemistry-I Theory | BP405T | 1.To understand the basics of phytopharmaceuticals. 2.To categorize the medicinal plants. 3.To infer about screening techniques of Phyto chemical screening. | 1.Student will demonstrate knowledge about modern concept and scope of Pharmacognosy.<br>2.Students will be able to describe the classification& source of crude drugs, taxonomy of medicinal plants and medicinal plant families.<br>3.Students will be able to describe the fundamental principles on cultivation, collection processing and evaluation of medicinal plants.<br>4.Students will be able to discuss the phyto-chemical screening techniques and able to identify the phyto-constitutes of plants |
| 37 | B. Pharmacy | Medicinal Chemistry I – Practical | BP406P | 1.To execute the synthesis of various compounds. | 1.Students will be able to plan different experiments for synthesis of drugs and also recall the structure of some important drugs.<br>2.Students will be able to synthesis of differnet compounds |

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| 38 | B. Pharmacy | Physical Pharmaceutics II – Practical | BP407P | 1.To understand the basic of physical pharmaceutics. 2.To execute the principle of reaction kinetics in formulations. 3.To operate the experimentation of shelf life. | 1.Students will be able to determine viscosity, surface tension and CMC of pharmaceuticals<br>2.Students will be able to apply the knowledge of reaction kinetics to pharmaceutical preparations<br>3.Students will be able to use suspending agents, flocculating agents, deflocculating agents in formulation of stable suspensions.<br>4.Students will be able to calculate expiration date for medicinal products through understanding of accelerated stability studies. |
| 39 | B. Pharmacy | Pharmacology I – Practical | BP408P | 1.To understand the basics of pharmacology.<br>2.To discuss pathophysiology of disease. 3.To demonstrate action of drugs on human body. | 1.Students will be able to describe the pharmacology of drugs acting on central nervous system.<br>2.Students will be able to employ the basic principles of cell injury and adaptations and pathophysiology of common diseases and its treatment<br>3.Students will be able to describe the pharmacology of drugs acting on peripheral nervous system<br>4.Students will be able to employ drugs used in management of pain |
| 40 | B. Pharmacy | Pharmacognosy and Phytochemistry-I Practical | BP409P | 1.To understand the basics of phytopharmaceuticals. 2.To categorize the medicinal plants. 3.To infer about screening techniques of phyto chemical screening. | 1.Practical skill development in identification of secondary metabolites<br>2.Identification of crude drugs<br>3.Student will be able to determine the various leaf constants<br>4.Students will be able to perform different pharmacopeial tests |
| 41 | B. Pharmacy | Medicinal chemistry II Theory | BP501T | 1.To relate pharmacological activity with chemical structure. 2.To understand about chemical synthesis. 3.To evaluate the QSAR . | 1.Students can correlate the pharmacology of a disease and its cure.<br>2.Students will have knowledge about the mechanism pathways of different class of medicinal compounds<br>3.Students will have the knowledge of chemical synthesis of some important drugs.<br>4.Students can establish the structural activity relationship of different classes of drugs.<br>5.Students will able to correlate the chemistry of drugs with respect to their pharmacological activity. |
| 42 | B. Pharmacy | Industrial Pharmacy I–Theory | BP502T | 1.To understand the role of physicochemical properties in product development. 2.To discuss the formulation of different dosage forms. 3.To understand about evaluation parameters. 4. To learn about packaging and its legal requirements. | 1.Students will have knowledge about pre formulation factors required for formulation of different dosage forms<br>2.Students will learn about formulation of different dosage forms as tablets, capsules, liquid oral, parenteral, ophthalmic preparations, aerosols, cosmetics<br>3.Students will learn about evaluation and quality control parameters of different dosage forms<br>4.Students will gain knowledge about importance of isotonicity, sterility in preparation of parenteral<br>5.Students will have knowledge about materials used for packaging of pharmaceutical products, their legal requirements, stability and quality control tests |
| 43 | B. Pharmacy | Pharmacology II – Theory | BP503T | 1.To understand the mechanism of drug action for treatment/cure 2.To relate pharmacology with other streams.<br>3.To learn about software assisted drug screening. | 1.Students would be able to understand the mechanism of drug action and its relevance in the treatment of different diseases.<br>2.Students can correlate pharmacology knowledge with different paramedical fields<br>3.Students will be able to screen newer drugs molecules on the animal simulator for predicting their potency and efficacy. |

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| 44 | B. Pharmacy | Pharmacognosy and Phytochemistry-II Theory | BP504T | 1.To understand the fundamentals of natural products with focus on metabolites. 2.To infer isolation and characterization of natural products. 3.To discuss industrial processing and scale up of phytopharmaceuticals. | 1.Students will be able to classify the structures of natural products as primary or secondary metabolites and understand the biosynthesis of the metabolites in plants and main precursor for these compounds.<br>2.Students will be able to attain the chemical composition of different phytoconstituents and therapeutic or commercial importance of these secondary metabolites.<br>3.The students will be able to isolate the phytoconstituents and perform spectral analysis of the isolated phytoconstituents.<br>4.Students will be able to understand the production and utilization of phytoconstituents at industrial scale.<br>5.Students will be able to use the techniques for extraction, isolation, characterization and identification of phytoconstituents. |
| 45 | B. Pharmacy | Pharmaceutical Jurisprudence | BP505T | 1.To understand the fundamentals of natural products with focus on metabolites. 2.To infer isolation and characterization of natural products. 3.To discuss industrial processing and scale up of phytopharmaceuticals. | Students will learn act and rules for regulating import export, manufacture and licensing of drugs<br>1.Students will have knowledge of labelling requirements of drugs and cosmetics<br>2.Students will learn about the laws and act governing profession of pharmacy and legislation in India<br>3.Students will have knowledge about various act governing fake drugs, misleading advertisement, alcoholic preparations, experimentation on animals, pricing of formulations and illegal termination of pregnancy<br>4.Students will have knowledge about ethical principles in pharmacy profession |
| 46 | B. Pharmacy | Industrial Pharmacy I–Practical | BP506T | 1.To identify critical preformulating attributes.<br>2.To execute experimentation for development of variety of dosage forms.<br>3.To operate assessment of containers. | 1.Students will be able to determine pre formulation parameters for pharmaceuticals<br>2.Students will be able to prepare tablets, capsules, syrups, eye drops, injections, pellets etc<br>3.Students will be able to prepare various cosmetic formulations<br>4.Students will be able to evaluate containers |
| 47 | B. Pharmacy | Pharmacology II – Practical | BP507P | 1.To understand basics of drug action.<br>2.To execute drug assay experimentation. | 1.Students will be able to understand various receptor actions using isolated tissue preparation<br>2.Students can estimate unknown concentration of the given drug solutions using standard drugs |
| 48 | B. Pharmacy | Pharmacognosy and Phytochemistry-II Practical | BP508P | 1.To operate evaluation of crude drugs. 2.To infer isolation and characterization of natural products. 3.To execute processing and scale up of phytopharmaceuticals in the laboratory. | 1.Students will be able to perform the macroscopical and microscopical evaluation of the crude drug.<br>2.Students will be able to assess the method of extractions and predict the chemical nature of the metabolites.<br>3.Students will be able to use the isolation techniques and evaluation of phytoconstituents.<br>4.Students will be able to assess the number of components present in the extract.<br>5.Students will be able to extract the volatile oils from crude drugs and their identification by chromatography. |

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| 49 | B. Pharmacy | Medicinal Chemistry III – Theory | BP601T | 1. To prepare themselves for the lifelong learning of antibiotics and their uses in different bacterial infections according to their mechanism of action (used in chemotherapy).<br>2. To learn, metabolism, mechanism of action of different classes of antibiotics studied earlier and their pros, and cones over other antibiotics, prodrugs, antimalarial drugs.<br>3. To discover the new updates on the Antitubercular and Antiviral and drugs used in the treatment of urinary tract infections.<br>4. To gain knowledge of newer clinically used antifungal agents, anthelmintic drugs, anti-protozoal drugs, and sulfonamide class of drugs.<br>5. To learn modern concepts of drug design, QSAR, how chemical features contribute to biological activity, chemical library synthesis,<br>synthesis of peptides, high-throughput screening. | 1. Students will be able to prepare themselves for the lifelong learning of antibiotics and their uses in different bacterial infections according to their mechanism of action (used in chemotherapy).<br>2. Students will be able to learn, metabolism, mechanism of action of different classes of antibiotics studied earlier and their pros, and cones over other antibiotics, prodrugs, antimalarial drugs.<br>3. Students will be able to discover the new updates on the Antitubercular and Antiviral and drugs used in the treatment of urinary tract infections.<br>4. Students will gain knowledge of newer clinically used antifungal agents, anthelmintic drugs, anti-protozoal drugs, and sulfonamide class of drugs.<br>5. Students will learn modern concepts of drug design, QSAR, how chemical features contribute to biological activity, chemical library synthesis, synthesis of peptides, high-throughput screening. |
| 50 | B. Pharmacy | Pharmacology III – Theory | BP602T | 1. To strengthen the basic knowledge in the field of pharmacology.<br>2. To demonstrate the detailed mechanism of action of the drugs.<br>3. To provide the fundamental knowledge of principles of toxicology and treatment of various poisonings.<br>4. To give emphasis on the knowledge of biological clock and chronopharmacology.<br>5. To understand the importance of pharmacology subject as the basis of therapeutics. | 1. Students can understand the application of basic pharmacological knowledge in the prevention and treatment of various diseases<br>2. Students can demonstrate the detailed mechanism of drug action at organ system/sub cellular/ macromolecular levels<br>3. Students can comprehend the principles of toxicology, treatment of various poisonings, and chronopharmacology<br>4. Students can apply the knowledge of biological clock and their significance leading to chronotherapy<br>5. Students can appreciate correlation of pharmacology with related medical sciences. |
| 51 | B. Pharmacy | Herbal Drug Technology – Theory | BP603T | 1. To explain the scientific methods for cultivation and collection of Medicinal Plants and Indian System of Medicines. 2. To characterize various nutraceutical and their use in various health conditions and importance of herb drug interactions. 3. To identify the requirements for preparation and develop herbal cosmetic and formulations.<br>4. To utilize knowledge of regulatory guidelines i.e WHO and ICH for quality control of natural drugs.<br>5. To enlist the regulatory requirements for Herbal Industry. | 1. Students will be able to explain the scientific methods for cultivation and collection of Medicinal Plants and Indian System of Medicines. 2. Students can characterize various nutraceutical and their use in various health conditions and importance of herb drug interactions. 3. Students will be able to identify the requirements for preparation and develop herbal cosmetic and formulations. 4. Students can utilize knowledge of regulatory guidelines i.e WHO and ICH for quality control of natural drugs.<br>5. Student will be able to enlist the regulatory requirements for Herbal Industry. |

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| 52 | B. Pharmacy | Biopharmaceutics and Pharmacokinetics – Theory | BP604T | 1.To discuss the principle of biopharmaceutics.<br>2.To explain compartmental and non compartmental models. | 1.Students will learn pharmacokinetics of drugs i.e. absorption, distribution, metabolism and excretion and factors affecting pharmacokinetic processes<br>2.Students will have knowledge of bioavailability, bioequivalence and in vivo, in vitro studies<br>3.Students will learn various pharmacokinetic models and their application to various routes of administration<br>4.Students will have knowledge of non-linear kinetics |
| 53 | B. Pharmacy | Pharmaceutical Biotechnology – Theory | BP605T | 1.To understand the basic of biotechnology.<br>2.To appreciate use of genetic engineering 3.To explain industrial production of enzymes and antibiotics. 4. To deduce official sterlity testinh methods | 1.Students will learn about use of microbes, enzymes, biosensors, genetic engineering, protein engineering etc in pharmaceutical industry<br>2.Students will gain knowledge about recombinant DNA technology, PCR, interferon and cloning vectors<br>3.Students will learn about immunity, hypersensitive reactions<br>4.Students will gain knowledge about preparation of vaccines, toxoids, antitoxins, serum-immune blood derivatives<br>5.Students will learn about hybridoma technology, Immuno blotting techniques, mutation and microbial genetics<br>6.Students will gain knowledge about fermentation method, media, sterilization and production of antibiotics |
| 54 | B. Pharmacy | Quality Assurance–Theory | BP606T | 1. Understand the cGMP aspects in a pharmaceutical industry<br>2. Appreciate the importance of documentation<br>3. Understand the scope of quality certifications applicable to pharmaceutical industries<br>4. Understand the responsibilities of QA & QC departments<br>5. Various aspects of quality control and quality assurance aspects of pharmaceutical industries. | 1. Students will Understand the cGMP aspects in a pharmaceutical industry<br>2. Student will Appreciate the importance of documentation<br>3. Student will Understand the scope of quality certifications applicable to pharmaceutical industries<br>4. Student will Understand the responsibilities of QA & QC departments<br>5. Student will understand Various aspects of quality control and quality assurance aspects of pharmaceutical industries. |
| 55 | B. Pharmacy | Medicinal Chemistry III – Practical | BP607P | 1.To execute synthesis of chemical intermediates. 2.To operate drawing of structure using softwares. | 1.Students will be able to perform synthesis of various intermeidates.<br>2.Students will be able to perform assay of antibiotics and antimalrials<br>3.Students will be able to use chemdraw for structures and reactions<br>4.Students will be understand of newer techniques such as microwave irradiation |
| 56 | B. Pharmacy | Pharmacology III – Practical | BP608P | 1.To appreciate the basics of bioassay. 2.To execute drug dose calculation based on dose response curve. | 1.Students will be able to develop understanding of principles of bioassay.<br>2.Students will be able to understand dose calculation and toxicity |
| 57 | B. Pharmacy | Herbal Drug Technology – Practical | BP609P | 1.To execute formulation of herbal medicines.<br>2.To operate extration procedure for herbal actives. | 1.Students will be able to prepare and standardize of different traditional herbal medicine.<br>2.Students will be able to apply theoretical knowledge obtained for extraction of phyto-chemicals, set extractionassembly, process material before extraction. |

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| 58 | B. Pharmacy | Instrumental Methods of Analysis – Theory | BP701T | 1. To understand fundamentals of spectroscopy.<br>2. To execute separation technique. 3. To evaluate the role of features of API and excipients. | 1.Student will able to understand various spectroscopy methods to plan for identification and estimation of drug contents<br>2.Student will be able to apply knowledge of chromatographic techniques for fractionation and isolation of drug/chemicals<br>3.Student can use knowledge to estimate quantity and quality of raw material, APT. excipients and final products, in stability studies and to establish storage conditions |
| 59 | B. Pharmacy | Industrial Pharmacy – Theory | BP702T | 1. To understand about regulatory guidelines. 2. To deduce the methods for commercialization of products from bench to market. | 1.Students will learn pilot plant scale up techniques for pharmaceuticals, relevant documentation, SUPAC guidelines<br>2.Students will have knowledge of technology transfer, guidelines, protocol, documentation and regulation<br>3.Students will learn regulatory requirements for drugs worldwide<br>4.Students will learn various quality management systems as GMP, GLP, ISO<br>5.Students will have knowledge of IND, AND, FDA submissions and management of clinical studies |
| 60 | B. Pharmacy | Pharmacy Practice – Theory | BP703T | 1. To learn and understand the compositio of hospitals. 2. To explain the mechanism of ADR reporting. 3. To appraise about nodel agencies for reporting of ADR. | 1.Students will have knowledge of organizational structure of hospital and drug store, their legal requirements, staff requirements and inventory control<br>2.Students will know the causes, detection, reporting and management of allergic drug reactions and interactions<br>3.Students will learn drug distribution system to various patient types in hospital as controlled by pharmacy and therapeutic committee<br>4.Students will learn to monitor patient compliance and counsel patients by reviewing medicating history<br>5.Students will have knowledge of various sources of drug information and training programmes in hospital<br>6.Students will have knowledge of clinical pharmacy and OTC drugs |
| 61 | B. Pharmacy | Novel Drug Delivery System – Theory | BP704T | 1. To understand the basics of novel drug delivery. 2. To categorize different personalized preparation. 3. To discuss role of nano technology in drug delivery. | 1.Students will learn mechanism and polymers involved in controlled release systems<br>2.Students will have knowledge of various novel drug delivery systems as mucosal, implantable, transdermal, gastroretentive and nasopulmonary<br>3.Students will have knowledge of nanotechnology in formulating liposomes, nanoparticles, niosomes and monoclonal antibodies<br>4.Students will also learn concepts of ocular and intrauterine drug delivery systems<br>5.Students will also learn various microencapsulation techniques |
| 62 | B. Pharmacy | Instrumental Methods of Analysis – Practical | BP705P | 1. To understand fundamentals of spectroscopy.<br>2. To execute separation technique. 3. To evaluate the role of features of API and excipients. | 1.Student can plan to estimate drug concentration of compounds or impurities in samples/ formulations, develop new methods for estimation quantitatively or qualitatively<br>2.Student can design strategy to extract, fractionate an isolate particular component form drug and impurity, related substances in samples/biological samples/ formulations<br>3.Student can develop new methods or accessories for quantitative and qualitative analysis for purity purpose |
| 63 | B. Pharmacy | Biostatistics and Research Methodology – Theory | BP801T | 1. To understand fundamentals of statistics. 2. To explain the applied part of the statistics in experimental design and biological studies. | 1.Student will demonstrate operation of Excel, SPSS and other softwares for data analysis and experiment desgin Understanding of statistical methods<br>2.Application of statistical techniques in problem solving |

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| 64 | B. Pharmacy | Social and Preventive Pharmacy – Theory | BP802T | 1. To understand basics of pharmacy with a relevance to the society. 2. To generate the speculative attitude amongst pharmacy professionals to cope up with changing needs | 1.Student will be able to understand of current issues in health and pharamceutical industry<br>2.Student will be able to develop thinking in current health care development<br>3.Student will be able to apply and evaulate alternative ways to solve problems in pharmaceutical issues |
| 65 | B. Pharmacy | Pharmaceutical Marketing – Theory | BP803ET | 1. To understand fundamentals of marketing/sales 2. To discuss the channels of distribution. 3. To appreciate role of front line team in product promotion. 4. To learn about mangement plans and dynamics | 1.Students will learn marketing skills, competitive analysis and market research techniques<br>2.Students will gain knowledge about product life cycle, branding, packaging, labelling and management<br>3.Students will gain knowledge about various promotional techniques for pharmaceutical products<br>4.Students will learn different marketing channels for product distribution<br>5.Students will learn pricing strategies and management in pharmaceutical industry |
| 66 | B. Pharmacy | Pharmaceutical Regulatory Science – Theory | BP804ET | 1. To understand about regulatory guidelines. 2. To deduce the methods for commercialization of products from bench to market. | 1.Students will gain knowledge about drug development process from pre-clinical studies to final stage of product development<br>2.Students will learn regulatory processes required for approval of drug application.<br>3.Students will learn documentation for export of Indian drugs to international market<br>4.Students will gain knowledge about clinical trials protocols and GCP regulations<br>5.Students will gain knowledge about code of federal regulations and regulatory authorities governing the manufacture and sale of pharmaceuticals |
| 67 | B. Pharmacy | Pharmacovigilance – Theory | BP805ET | 1. To discuss the principles of pharmacovigilance. 2. To categorize drugs and diseases. 3. To identify the regulators. 4. To explain the role of primary reporting and therapeutic drug monitoring. | 1.Students will gain knowledge about detection, reporting, seriousness assessment, prevention and regulations of adverse drug reactions e.g. vaccine pharmacovigilance<br>2.Students will learn classification of drugs and diseases<br>3.Students will gain knowledge of coding, resources and establishment of pharmacovigilance programme<br>4.Students will learn D &C act and ICH guidelines for pharmacovigilance<br>5.Students will gain knowledge about statistical methods for evaluating medication safety data<br>6.Students will learn drug safety evaluation in special population |
| 68 | B. Pharmacy | Quality Control and Standardization of Herbals – Theory | BP806ET | 1. To understand about regulatory guidelines. 2. To deduce the methods for commercialization of herbal products from bench to market. | 1.Students will be able to develop knowledge of WHO guidelines for quality control of herbal drugs<br>2.Students will be able to exemplify quality assurance in herbal drug industry regulatory approval process and their registration in Indian and international markets |
| 69 | B. Pharmacy | Computer Aided Drug Design – Theory | BP807ET | 1. To appreciate use of computational tools in drug discovery. 2. To discuss the application of software's for drug design. | 1.Students will be able to use concept of SAR and QSAR with docking for drug design and discovery<br>2.Student will be well acquainted with various molecular modelling software's<br>3.Student will develop understanding of importance of drug design and discovery process |

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| 70 | B. Pharmacy | Cell and Molecular Biology – Theory | BP808ET | 1. To understand the principles of molecular biology. 2. To discuss the structure and function of cell. | 1.Student will be able to describe chemical foundations of cell biology<br>2.Student will be able to describe structure and functions of cells and their components<br>3.Student will be able to summarize the cell cycle. |
| 71 | B. Pharmacy | Cosmetic Science | BP809ET | 1. To appreciate use of cosmetics in modern day lifestyle.<br>2. To discuss the development of cosmetic formulations. | 1.Students will gain knowledge about cosmetic excipients suited according to cosmetic application site<br>2.Students will learn principles of formulation and building blocks of skin and hair care products<br>3.Students will learn role of herbs and analytical methods for cosmetics<br>4.Students will gain knowledge about cosmetic evaluation<br>5.Students will learn to correct cosmetic problems associated with skin and hair |
| 72 | B. Pharmacy | Experimental Pharmacology | BP810ET | 1. To understand the types of animal models used in pharmacology. 2. To recognize the screening techniques.<br>3. To create an independent research plan. | 1.Students will be able to appreciate the applications of various commonly used laboratory animals.<br>2.Students will be able to appreciate and demonstrate the various screening methods used in preclinical<br>research<br>3.Students will be able to appreciate and demonstrate the importance of biostatistics and research methodology 4.Students will be able to design and execute a research hypothesis independently |
| 73 | B. Pharmacy | Advanced Instrumentation Techniques | BP811ET | "1. To understand the advanced instruments used and its applications in drug analysis<br>2. To understand the chromatographic separation and analysis of drugs<br>3.To understand the calibration of various analytical instruments<br>4.To know analysis of drugs using various analytical instruments | 1.Student will able to understand various advance methods of analysis to plan for identification and estimation of drug contents like NMR and Mass Spectroscopy.<br>2.Student will be able to apply knowledge of hyphenated chromatographic techniques for fractionation and isolation of drug/chemicals.<br>3.Student will be able to apply knowledge to calibrate various instruments before using them for analysis.<br>4.Student will be able to explore the techniques of thermal methods, x-ray and RIA and various extraction methods for drug analysis.<br>" |
| 74 | B. Pharmacy | Dietary Supplements and Nutraceuticals | BP812ET | 1. To explain the need of food as medicine. 2. To recognize the key ingredients of nutraceuticals. 3. To understand the regulatory perspectives of dietary supplements | 1.Students will be able to recognize the necessity of supplements by the diverse set of people to sustain healthy life.<br>2.Students will be able to realize the consequence of insufficiencies in dietary supplements<br>3.Students will be able to understand the ingredients of dietary supplements and their uses<br>4.Students will be able to discuss the regulatory as well as commercial facets of dietary supplements inclusive of health claims |
| 75 | B. Pharmacy | Project Work | BP813PW | 1. To plan a research study. 2. To execute the plan of work as a representative sample of research | 1.Students will be able to plan/oragnize independent formulation specific research questions of relevance to the knowledge development within the main field, on the basis of relevant theories and in the current state of knowledge Independently search for, select and assess sources by means of structured strategies and use information from the literature in the implementation of a research project<br>2.Students will be able to carry out a study, collect data, analyse results and independently compile and critically assess the significance and limitations of these on the basis of the formulated research question and chosen method<br>Make assessments with respect to aspects of research ethics with specific relevance to his/her thesis project |