Shri. Yashwantrao Bhonsale Education Society's
YASHWANTRAO BHONSALE COLLEGE OF PHARMACY
Bldg. No. 02, BKC, A/ P: Charathe - Vazarwadi, Tal: Sawantwadi, Dist.: Sindhudurg, Maharashtra- 416 510
Approved by AICTE, PCI, New Delhi, Govt. of Maharashtra, DTE. Affiliated to Mumbai University (B. Pharm, M. Pharm) and MSBTE (D. Pharm) DTE Code: 3480; University Code: 1027; MSBTE Code: 1878
www.sybespharmacy.com +912363-272233/272299 Email:ybpharmacy@gmail.com
Mr. Achyut K. Sawantbhonsale Executive Chairman
Dr. Vijay A. Jagtap Principal

YEAR- FIRST YEAR B. PHARMACY
(TERM-I) SEMESTER-I
PCI SYLLABUS

SR.NO	COURSE	COURSE CODE	COURSE OUTCOMES
1.	Pharmaceutical Inorganic chemistry	BP104T	**CO1-**Describe the sources of impurities and methods of determination of the impurities in inorganic drugs and pharmaceuticals.
			CO2-Understand the pharmaceutical application of inorganic compounds.
			CO3-State the source, properties and medical significance of inorganic compounds.
			CO4-Identify Get an insight of medicinally important inorganic compounds.
			CO5-Understand pharmaceutically important radioactive substances.
2.	Pharmaceutical Analysis -I	BP102T	**CO1-**Estimate the basic concepts of pharmaceutical analysis, different analytical techniques, preparation and standardization of different solutions and errors.
			CO2- Illustrate the theories of acid-base indicators, neutralization curves and non-aqueous titration.
			CO3-Generalize the basic principles of precipitation titration, complexometric titration and gravimetric analysis.
			CO4-Understand the concept of oxidation reduction titration also principles and application of different types of redox titration.
			CO5-Describe the principles and concept of conductometry potentiometry and polarography.

3.	Human Anatomy and Physiology -I	BP101T	**CO1-**Define the anatomy & physiology of cells, various tissues, organs, and systems with basic terminologies.
			CO2-Illustrate the structure and underline function of Integumentary system, skeletal system, joints, Cardiovascular system, Peripheral nervous system, Special senses and Lymphatic system.
			CO3-Enlist the composition, functions of blood & describe the process of hemopoiesis, haemoglobin formation and blood coagulation.
			CO4- Express the regulation of cardiac cycle, blood pressure, ECG.
4.	Pharmaceutics-I	BP103T	**CO1-**Understand the historical background of the profession of pharmacy.
			CO2-Explain the professional way of handling the prescription.
			CO3-Understand the posology & pharmaceutical calculations.
			CO4- Explain the different types of dosage forms.
			CO5-Understand the manufacturing process of different dosage forms.
5.	Communication Skills	BP105T	**CO1-**Recognize verbs and passive voice in communication.
			CO2-Expertise in skills to confidently stand in group discussion.
			CO3- Confidence to communicate effectively.
			CO4- Recognize the importance of ethics, human values, honesty and integrity.
			CO5- Understand Ethical practice in pharmaceutical profession.
6.	Pharmaceutical Inorganic Chemistry lab-I		CO1- Identify impurities present in inorganic medicinal compounds by standard pharmacopoeia test

			CO2 - Identify inorganic compound by qualitative analysis.
			CO3- Analyse purity of inorganic pharmaceuticals
			CO4-Understand preparation of inorganic pharmaceuticals.
7.	Human Anatomy and Physiology -I	BP107P	CO1- Handle the instruments used in laboratory
			CO2-Describes the body tissues based on the structure and organisation cells.
			CO3-Identify the positions of human bone the skeleton with their importance
			CO4-Calculate RBCs sedimentation rate, RBC count, WBC hemoglobin count, bleeding and clotting time by using different methods
			CO5-Record pulse rate, heart rate & blood pressure
8.	Pharmaceutical Analysis lab-I	BP108P	CO1-Prepare solutions of specific Normality and Molarity.
			CO2- Standardize solutions with respect to Normality and Molarity.
			CO3- Analyse the purity of pharmaceutical compounds using assay procedures.
			CO4- Determine Normality by Electro-analytical method.
8.	Pharmaceutics Lab-I	BP 109 P	CO1-To formulate monophasic liquids like syrup, elixir, linctus and solution
			CO2 - To understand the method of preparation for biphasic liquids like suspensions and emulsions
			CO3 - To prepare powders and granules
			CO4 - To understand the method of manufacturing for suppositories and semisolid dosage forms
			CO5 - To formulate mouthwashes and gargles

NB YEAR- FIRST YEAR B. PHARMACY
(TERM-II) SEMESTER-II
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SR.NO	COURSE	COURSE CODE	COURSE OUTCOMES
1.	Pharmaceutical organic chemistry-I	BP_202_T	**CO1-**Assign IUPAC and stereochemical nomenclature of compounds containing multiple functional groups.
			CO2-Understand stability, reactions, hybridization of Alkanes, Alkenes and Conjugated dienes.
			CO3-Explain method of preparation, reactions, reactivity, structure and uses of alkyl halide and alcohol compounds.
			CO4-Interpret method of preparation, reactions, structures and uses of carbonyl compounds.
			CO5-Describe method of preparation, reactions, structure, uses, acidity of carboxylic acids.
2.	Human Anatomy and Physiology II	BP201T	CO1- Recall organization of nervous system with structure & functions of central nervous system
			CO2- Identify the role of different GIT secretions & nervous system in anatomy & physiology of digestive system
			CO3- Outline mechanism of respiration & urine formation through respiratory & urinary system
			CO4-Correlate endocrine glands & their hormonal secretions in maintenance of homeostasis
			CO5- Compare male & female reproductive system anatomy & physiology
			CO6- Understand role of genetics in human body
3.	Biochemistry	BP203T	**CO1-** Identify the commonly occurring carbohydrates, amino acids and fatty acids.
			CO2-Understand order and structure of oligo-saccharides, poly- saccharides/ peptides and membrane lipids.
			CO3-Recall the classification of vitamins and the biochemical role involved in their deficiency disorder.

			CO4- Review the biological oxidation, bioenergetics, electron transport chain.
			CO5-Understand the process of digestion, absorption, storage and retrieval of cellular nutrients.
4.	Pathophysiology	BP204T	CO1- To understand the basic principles of cell injury and adaptations.
			CO2-To learn the detailed mechanism involved in the process of inflammation and repair.
			CO3-To explain the diseases related to cardiovascular, respiratory, renal, endocrine, nervous & gastrointestinal system.
			CO4-To explain the haematological diseases, inflammatory bowel diseases, alcoholic liver diseases, diseases of bones and joints, infectious diseases & sexually transmitted diseases.
			CO5-To understand in detail the basic principles of cancer.
5.	Pharmaceutical organic chemistry lab-I	BP208P	CO1-Explain the structure, name and the type of isomerism of the organic compound.
			CO2- Understand the reaction, name the reaction and orientation of reactions
			CO3-Account for reactivity/stability of compounds.
			CO4-Identify &confirm the identification of organic compound.
6.	Human Anatomy and Physiology lab II	BP207P	CO1-Identify the gross morphology, structure and functions of various organs of the human body.
			CO2-Identify the various tissues and organs of different systems of human body.
			CO3-Appreciate coordinated working pattern of different organs of each system.
			CO4-Appreciate the interlinked mechanisms in the maintenance of normal functioning of human body

7.	Biochemistry lab	BP209P	CO1-Perform identification test for proteins, carbohydrates and reducing sugars
			CO2-Determine the unknown samples for the presence of blood creatinine, blood sugar,serum total cholesterol
			CO3-Study the effect of temperature and effect of receptors on salivary amylase activity and determine its activity
			CO4-Perform qualitative analysis on urine for its abnormal constituents, proteins and reducing sugars.
8.	Environmental sciences	BP206T	**CO1-**Create awareness about environmental problems among learners.
			CO2-Impart basic knowledge about the environment and its allied problems.
			CO3-Develop an attitude of concern for the environment.
			CO4-Motivate learner to participate in environment protection and environment improvement.
			CO5-Strive to attain harmony in nature

YEAR- SECOND YEAR B. PHARMACY
(TERM-I) SEMESTER-III
PCI SYLLABUS

SR.NO	**COURSE**	**COURSE CODE**	**COURSE OUTCOMES**
1.	Physical Pharmaceutics-I	BP302T	**CO1-**Understand the concept of Solubility, Dissolution & Distribution Phenomenon influencing drug release & action.
			CO2- Recall the states of matter and estimate the physicochemical properties of drugs affecting quality of drug product.
			CO3- Illustrate the concept of surface and interfacial tension in biphasic system.
			CO4- Apply the pharmaceutical knowledge of Drug Complexation & Protein binding.
			CO5-Demonstrate concept of pH & application of buffers in the formulation of dosage forms.

2.	Pharmaceutical organic chemistry-II	BP301T	**CO1-** Describe general methods of preparation of organic compounds.
			CO2- Understand the stability and reactions of organic compounds.
			CO3- Understand the chemistry, chemical reactions and analytical constants of fats and oils.
			CO4- Emphasize mechanisms of chemical reactions.
			CO5- Explain the structure and uses of organic compounds.
3.	Pharmaceutical engineering	BP304T	**CO1-**Illustrate the mechanics of fluid, fluid flow & its measurement in accordance with statics & movement of fluids.
			CO2-Apply basic principles including description of equipment & accessories involved in unit operations of size reduction, size separation, evaporation & distillation
			CO3-Understand the operations involved in heat measuring devices, heat interchangers & heat exchangers.
			CO4-Explain objective, application, principles, construction, working, uses, merits & demerits of instruments involved in drying, mixing, filtration & centrifugation.
			CO5-Discuss the materials of pharmaceutical plant construction, corrosion & its prevention & also basics of material handling system with respect to pharmaceutical industry.
4.	Pharmaceutical microbiology	BP303T	**CO1-** Understand the methods of identification, cultivation & preservation of various microorganisms.
			CO2- Explain the different staining techniques and biochemical tests.
			CO3-Understand the morphology, classification & reproduction of fungi and viruses.
			CO4-Explain the process of microbiological assay.
			CO5-Understand the types of microbial spoilage & animal cell culture techniques.

5	Physical Pharmaceutics lab-I	BP306P	CO1-Estimate Solubility and Distribution Phenomenon of drug.
			CO2-Illustrate Surface & interfacial phenomenon including adsorption in stability of biphasic dosage form.
			CO3-Apply the Concept of Hydrophilic Lipophilic Balance & Critical Micellar Concentration in practical Aspects.
			CO4-Analyze the complex formation by solubility & pH titration method.
6	Pharmaceutical organic chemistry lab-II	**BP305P**	**CO1-D**etermine analytical constants of fats and oils
			CO2-Carry out preparation of organic compound and purify by recrystallization, steam distillation
			CO3- Explain principle, mechanism and procedure of synthesis of given organic compound
			CO4- Calculate theoretical yield, practical yield and percentage yield.
7	Pharmaceutical microbiology lab	BP307P	**CO1**- To demonstrate the use of various equipment's and their processing used in experimental microbiology.
			CO2- To describe the process of sterilization and sub culturing.
			CO3- To illustrate different staining techniques and motility determination by hang drop method.
			CO4-To prepare media, nutritional stabs & slants and pure culture of micro-organisms.
			CO5-To perform sterility and biochemical test, microbiological assay and Bacteriological analysis.
8.	Pharmaceutical engineering lab	BP308P	CO1-Determine radiation constant, heat transfer coefficient, moisture content, loss of drying & humidity of air.
			CO2-Calculate efficiency of steam distillation & uniformity of index.
			CO3-Construct drying curves & study the effect of time on the rate of crystallization.

			CO4-Evaluate size distribution & verify the laws of size reduction by determining various parameters related to Ball mill.
			CO5-Demonstrate major equipment's used in pharmaceutical industry.
			CO6-Discuss construction working & applications of pharmaceutical machinery & factors affecting rate of filtration & evaporation.

YEAR- SECOND YEAR B. PHARMACY
(TERM-II) SEMESTER-IV
PCI SYLLABUS

SR.NO	COURSE	COURSE CODE	COURSE OUTCOMES
1.	Medicinal Chemistry I	BP402T	**CO1-**Understand the chemistry of drugs with respect to their pharmacological activity.
			CO2-Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs.
			CO3-Know the Structural Activity Relationship (SAR) of different class of drugs.
			CO4- Write the chemical synthesis of some drug.
			CO5- Describe MoA, synthesis, resistance, metabolism of drug.
2.	Physical Pharmaceutics-II	BP403T	**CO1-** Understand types & properties of colloidal dispersion.
			CO2- Illustrate Flow properties of liquids with respect to newton's law.
			CO3- Summarize principle behind preparation of stable coarse dispersion with respect to Emulsion & Suspension.
			CO4- Discuss Micromeritics concept with respect to fundamental & derived properties of powders.
			CO5- Apply principles of chemical kinetics to ascertain stability of pharmaceuticals.

3.	Pharmacology -I	BP404T	**CO1-** Understand drug, pharmacology, pharmacokinetics, pharmacokinetics and routes of drug administration.
			CO2- Explain Pharmacodynamics- Principles and mechanisms of drug action through G-protein couples, ion channel, enzyme linked, JAK STAT and nuclear receptors.
			CO3- Illustrate classification, pharmacology & therapeutic uses of Pharmacology of drugs acting on peripheral nervous system e.g. Sympathomimetics, Para sympathomimetics, Sympatholytic, Para-sympatholytic, Neuromuscular blocking agents and skeletal muscle relaxants (peripheral), local anaesthetics.
			CO4-Extend pharmacology of drugs acting on central nervous system & their uses in CNS disorders e.g., general anaesthetics, sedative hypnotics, antiepileptic, Alcohol etc.
			CO5-Summarize the pharmacology of drugs acting on central nervous system & their uses in CNS disorders e.g. psychosis, mental illness, Parkinson's disease and Alzheimer's disease, CNS stimulants.
4.	Pharmaceutical Organic Chemistry-III	BP401T	**CO1-**Understand the methods of preparation and properties of organic compounds.
			CO2-Explain the stereo chemical aspects of organic compounds and stereo chemical reactions.
			CO3-Know the medicinal uses and other applications of organic compounds.
5.	Pharmacognosy and Phytochemistry-I	BP405T	**CO1-**Give an insight to the introduction to pharmacognosy and classification of crude drugs.
			CO2-Evaluate the quality control parameters of drugs obtained from natural origin.
			CO3-Explain the aspects of cultivation and factors affecting cultivation of medical plants.
			CO4-Illustrate the methods and applications of Plant Tissue Culture.

			CO5-Understand the pharmacognosy in different systems of medicine and secondary metabolites.
			CO6-Cite the examples and significance of plant products, secondary metabolites and marine drugs.
6.	Physical Pharmaceutics Lab-II	BP407P	**CO1-** Estimate particle size, Particle size distribution & Flow rate of powder by using micromeritics principles.
			CO2– Analyse flow properties of liquid by rheological measurements.
			CO3–Evaluate properties of coarse dispersion using various parameters.
			CO4– Analyse the drug stability by applying principles of chemical kinetics.
7.	Medicinal Chemistry Lab-I	BP406P	**CO1-S**ynthesize drugs
			CO2-Carry out assay of drugs
			CO3-Determine partition coefficient of drug
8.	Pharmacology lab-I	BP408P	CO1-Understand the pharmacological actions of different categories of drugs
			CO2-Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.
			CO3-Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
			CO4-Observe the effect of drugs on animals by simulated experiments
			CO5-Appreciate correlation of pharmacology with other bio medical sciences
9.	Pharmacognosy and Phytochemistry lab-I	BP408P	CO1-Introduce the students to carry out chemical evaluation of natural drugs used in complimentary system of medicine
			CO2-Highlights the microscopic qualitative and quantitative evaluation of powdered crude drugs of natural origin.
			CO3-Understand principles involved and carry out physical evaluation of natural crude drug powders.

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YEAR- THIRD YEAR B. PHARMACY
(TERM-I) SEMESTER-V
CBCS SYLLABUS

SR.NO	COURSE	COURSE CODE	COURSE OUTCOMES
1.	Organic chemistry-III	BPH_C_501_T	**CO1-** Name the basic heterocyclic rings of 5 membered and 6 membered.
			CO2-Understand the synthesis mechanism for 5 membered and 6 membered rings.
			CO3-Compare the basicity and write the resonance structures of the 5 membered and 6 membered rings.
			CO4-Understand the stereochemistry of steroids.
			CO5-Understand the stereochemistry of peptides and polymers.
2.	Pharmaceutics-II	BPH_C_502_T	**CO1-**Understand physicochemical principles of disperse system.
			CO2-Describe theoretical aspects of suspension, emulsion, semi-solids, suppositories, pharmaceutical aerosol and cosmetics including their formulation.
			CO3- Categorize advantages, disadvantages, desirable features and pharmaceutical applications of suspension, emulsion, semisolids, suppositories and pharmaceutical aerosols with definition.
			CO4- Elaborate large scale manufacturing and packaging of suspension, emulsion, semi-solids, suppositories and pharmaceutical aerosol including their evaluation
			CO5-State raw materials, formulation and evaluation (including BIS) of cosmetic products.
			CO6- Understand regulatory aspects, microbiological aspects and toxicology of cosmetics.
3.	Pharmaceutical Biotechnology	BPH_C_503_T	**CO1-** Discuss basics of modern Biotechnology and its scope.
			CO2- Discuss about the tools, techniques, ethics and environmental safety involved in

			gene cloning, and the applications of Recombinant DNA technology.
			CO3- Remember different tools of molecular biotechnology.
			CO4- Explain different techniques and applications of microbiological assays, enzyme immobilization and cell culture.
			CO5-Discuss about basics concepts of fermentation technology and immunology.
			CO6- Elaborate on concepts used for production of vaccines, antibiotics and monoclonal antibodies for treating the human disease.
4.	Pharmacology-II	BPH_C_504_T	**CO1-**Differentiate mechanism of action, kinetics, ADR & uses for different antimicrobial agents like sulphonamide's, quinolones, penicillin's, tetracycline, aminoglycosides, chloramphenicol.
			CO2- Classify anti TB, Antileprotic, antifungal, anticancer& antiviral drugs.
			CO3- Classify & explain drugs used in malaria, amoebiasis, helminthiasis.
			CO4- Recall the drugs act as immunomodulators/immuno-suppressor along with its mechanism of action.
			CO5- Recall drugs for different endocrine related disorders.
			CO6- Explain pharmacology of drugs for anaemia, coagulants, anticoagulants, thrombolytic & antiplatelet drugs.
5.	Cosmeticology	BPH_E_512_T	**CO1-** Understand the physiological, regulatory and marketing aspects of cosmetics.
			CO2 -Describe the toxicological aspects and toxicity testing protocol for cosmetics.
			CO3- Explain the requirements for large scale manufacturing of various cosmetics products along with its functional and physicochemical evaluation.
			CO4- Describe the regulatory guidelines and sensorial assessment for cosmetics.

6.	Packaging of Pharmaceutical	BPH_E_513_T	**CO1-**Classify Packaging materials and explain the functions and design aspects.
			CO2-Discuss the different primary and ancillary packaging materials, their functions and evaluation.
			CO3-Elaborate on labelling aspects of pharmaceuticals.
			CO4-Discuss sterilization and stability of packaging materials.
7.	Organic chemistry lab-III	BPH_C_505_L	CO1- Separation of simple compound mixtures.
			CO2-Identify organic compounds based on simple tests
			CO3-Recrystallize compounds use single solvent and binary solvent mixtures.
8.	Pharmaceutics lab-II	BPH_C_506_L	CO1-Understand the formulation aspects of biphasic, semisolid dosage forms, suppository and cosmetic products.
			CO2- Illustrate calculations involved in formulations.
			CO3- Apply the importance of quality evaluation of biphasic liquid dosage forms, semisolids, suppositories, aerosols and cosmetic products.
			CO4- **I**dentify categories or uses of ingredients used in manufacturing of biphasic, semisolid dosage forms, suppository and cosmetic products.
9.	Experimental techniques in microbiology and biotechnology lab	BPH_C_507_L	CO1- Recall the principle of common laboratory equipment along with concept of sterilization
			CO2-Develop pure cultures along with its characterization
			CO3-Identify different bacteria using various staining techniques (morphological study) and characterization of same
			CO4-Analyze quality of raw material, and water and assessment of extent of microbial contamination using counting technique

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YEAR- THIRD YEAR B. PHARMACY
(TERM-II) SEMESTER-VI
CBCS SYLLABUS

SR.NO	COURSE	COURSE CODE	COURSE OUTCOMES
1.	Pharmaceutics -III	BPH_C_602_T	**CO1-**Able to categorize advantages, disadvantages, desirable features, types and pre-formulation aspects of tablets and capsules with definition.
			CO2- Illustrate the concepts of solid oral dosage form design & formulation strategies including selection of excipients, methods, layout of manufacturing area, processing problems, defects & remedies in tablets and capsules.
			CO3- Discuss large scale manufacturing equipment's, evaluation of tablets and capsules as per official standards, packaging and labelling.
			CO4-Describe stability studies and introduction to ICH guidelines.
			CO5-Understand the concept of responsibilities of quality assurance & quality control departments.
			CO6-Interpret the importance and study of documentation.
2.	Pharmacognosy II	BPH_C_604_T	**CO1-**Describe the concept of evaluation of crude drugs, principles and methods of extraction of Phyto-constituents.
			CO2-Relate the source, composition, chemistry, extraction methods, evaluation, chemical tests, therapeutic uses, biosynthetic pathways of crude drugs containing Volatile oil.
			CO3-Discuss the classification, occurrence, composition, extraction, preparation, uses, tests of Resins and Tannins.
			CO4-Recall the source chemistry and therapeutic uses of Iridoids, Quinones, Sesquiterpenes, Diterpenes, Tetraterpenoids and Organo-sulphur compounds.

			CO5-Illustrate the methods and applications of Plant Tissue Culture.
			CO6-Cite the examples and significance of Excipients of natural origin.
3.	Pharmaceutical Chemistry- I	BPH_C_601_T	**CO1-** Identify and study the suitable drug targets for treatment of disorders.
			CO2-Identify the relationship between the physicochemical properties of the chemical entity and biological response.
			CO3- Draw a schematic metabolic pathway for any given drug.
			CO4-Identify the SAR of all the classes of antimalarial, antitubercular, anti-infective, antibiotic, anti-parasitic disorders.
4.	Pharmaceutical Analysis-II	BPH_C_603_T	**CO1-** Understand the Principle, instrumentation, application and limitations in instrumental techniques involving molecular as well as atomic absorption and emission techniques**.**
			CO2-Explain the basic concepts, working, principle and applications of X-ray diffraction technique, potentiometric titrations and thermal methods of analysis like TG, DSC and DTA.
			CO3-Explain the concepts and quality control aspects related to radiopharmaceuticals**.**
			CO4-Calculate and interpret the results for spectral analysis and statistical data analysis**.**
5.	Pharmaceutical Excipients	BPH_E_613_T	**CO1-** Define, classify and elaborate on regulatory aspects of pharmaceutical excipients.
			CO2-Understand the characterization and interactions of excipients with APIs and packaging materials.
			CO3- Elaborate on common and novel excipients in Pharmaceuticals.
			CO4- Explain the role of polymers as excipients.
6.	Pharmaceutical Management	BPH_E_608_T	**CO1-**Explain components of Company's financial statements and interpret. **CO2-**Elaborate importance of marketing in the pharmaceutical industry. **CO3-**Explain basic principles of management.

			CO4-Explain the importance of management in quality control and government regulations.
7.	Pharmaceutical Analysis Lab-II	BPH_C_607_L	**CO1:** Record the absorbance and calculate concentration of analyte in formulation or as an API by use of A (1%, 1cm), single point and double point standardisation by UV spectrophotometer.
			CO2: Relate and construct linear regression analysis data for colorimetric assays and operate a colorimeter instrument.
			CO3: Record and calculate the concentration of an analyte by measure of fluorescence of an analyte in absence and presence of quenching agent.
			CO4: Operate a Ph meter, measure equivalence point by potentiometric titration, calculate pKa and normality for a given acid or mixture of acids.
			CO5: Understand the sample preparation technique for FTIR spectroscopy, interpret the IR spectra to identify the functional groups of an analyte , and understand the working of a flame photometer
8.	Pharmaceutics lab -III	BPH_C_606_L	CO1-Formulate solid dosage forms like tablets and capsule.
			CO2-Evaluate excipients, tablets and capsule for their quality.
			CO3-Understand the tablet coating process.
			CO4-Learn the concepts of accelerated stability testing and shelf life calculations.
			CO5-Construct experiments as per Good Laboratory Practices and record in the journals.
9.	Pharmaceutical Chemistry lab- I	BPH_C_605_L	**CO1-**Understand the synthesis of drugs.
			CO2-Know the difference between conventional synthesis and green chemistry approach.
			CO3- To know the medicinal uses and applications of drugs synthesized.

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YEAR- FINAL YEAR B. PHARMACY
(TERM-I) SEMESTER-VII
CBCS SYLLABUS

SR.NO	COURSE	COURSE CODE	COURSE OUTCOMES
1.	Pharmaceutical Chemistry-II	BPH_C_701_T	**CO1-**Recognize Chemical Class of drugs depending upon chemical, target based and therapeutic classification of drugs belonging to from cancer therapy, antiviral agents , CVS diseases and disorder and Diabetic therapy.
			CO2-Draw structure and allocate Chemical nomenclature along with stereochemistry of structures of the drug from cancer therapy, antiviral agents, CVS diseases and disorder and Diabetic therapy.
			CO3-Correlate Structural activity relationship of the drug from cancer therapy, antiviral agents, CVS diseases and disorder and Diabetic therapy.
			CO4- Illustrate mechanism of action of the drug from cancer therapy, antiviral agents, CVS diseases and disorder and Diabetic therapy.
			CO5- Describe synthesis with help of reactions involved for selected drugs in from cancer therapy, antiviral agents, CVS diseases and disorder and Diabetic therapy.
			CO6-Predict different metabolite of selected drug and its correlation to MAO from cancer therapy, antiviral agents, CVS diseases and disorder and Diabetic therapy.
2.	Pharmaceutical analysis-III	BPH_C_703_T	**CO1-**Describe the concepts of terminology related to chromatographic techniques like HPLC/HPTLC/TLC/Ion Exchange/size Exclusion/Paper chromatography.
			CO2-Discuss in detail instrumentation and application of chromatography and spectroscopy methods in pharmaceutical industry.
			CO3- Adopt the analytical validation methods.

			CO4-Understand the structural elucidation in the spectroscopy techniques.
			CO5-Illustrate the sampling procedure and results for the chromatography and spectroscopy techniques.
3.	Intellectual property rights	BPH_E_709_T	**CO1-**Gain an insight into the types of Intellectual Property rights and its benefits.
			CO2-Understand the provisions of Patent Act and its International regulations.
			CO3-Describe the procedures for filing of Intellectual properties.
			CO4-Explain the grounds of opposition and infringement of Intellectual property rights.
			CO5-Apply the knowledge of Intellectual property rights in the field of pharmaceutical development.
4.	Pharmacognosy-III	BPH_C_702_T	**CO1-**Understand the source, composition, general methods of extraction, evaluation, chemical tests, therapeutic uses of crude drugs containing steroidal, triterpenoidal, anthraquinone, flavonoidal glycosides, alkaloids and glycoproteins.
			CO2-Describe the biosynthetic pathways of alkaloids obtained from different amino acids and of anthraquinone glycosides.
			CO3-Understand the concept of Ayurveda and Herbal drug technology and regulatory requirements for Ayurvedic, Siddha, Unani (ASU) Medicines and Phytopharmaceuticals.
			CO4-Apply the concept of formulation, herbal drug standardization and relate the knowledge of drug and food interactions with the drugs obtained from natural origin.
			CO5-Apply the knowledge of extraction, quantitative, chromatographic & spectroscopic analysis for the characterization to herbal phytochemicals.
5.	Pharmacology-III	BPH_C_704_T	**CO1-**Categorize local anaesthetic, General anaesthetic, sedatives & hypnotics.
			CO2-Elaborate pharmacology of anti-epileptic & antiparkinsonian drugs.

			CO3- Classify & explain drugs for psychosis, depression, mania, opioid analgesics & CNS stimulants.
			CO4-Correlate autacoids like histamine, serotonin, Eicosanoids, NSAID & drugs related to it.
			CO5-Classify & explain pharmacology of drugs related to peptic ulcer, antiemetics, laxative, purgatives & ORS Solution.
6.	Pharmaceutical Jurisprudence	BPH_C_705_T	**CO1-**Understood the history behind the development of pharmaceutical legislation in India.
			CO2-Present the concepts and formulae for the pricing of drugs & pharmaceuticals.
			CO3-Summarize offences & penalties concerned with laws for drugs and pharmaceuticals.
			CO4-Write the insights of Drug Regulatory Affairs.
7.	Pharmaceutical Analysis-III lab		**CO1:** Estimate pka of benzoic acid.
			CO2: Determine the validation parameters by UV spectroscopy
			CO3: Perform the Assay of Pharmaceutical formulations using instrumental techniques like UV Spectroscopy
			CO4: Analyze the caffeine and sodium benzoate injection by simultaneous equation method and absorbance ratio method.
			CO5: Demonstrate Qualitative analysis of sample by Column chromatography/IR/ HPLC/ HPTLC/TLC/ GC techniques
8.	Pharmacognosy Lab-III		**CO1:** Distinguish the Crude drugs based on morphological characters.
			CO2: Identify Crude drugs based on morphological, microscopical section evaluation.
			CO3: Authenticate powdered crude drugs based on microscopical characteristics.
			CO4: Analyze herbal drugs for presence of phytochemicals using phytochemical tests.
			CO5: Compare extraction methods and TLC analysis for phytoconstituents.

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YEAR- FINAL YEAR B. PHARMACY
(TERM-II) SEMESTER-VIII
CBCS SYLLABUS

SR.NO	COURSE	COURSE CODE	COURSE OUTCOMES
1.	**Pharmaceutical chemistry-III**	BPH_C_801_T	**CO1-**Draw structure and allocate Chemical nomenclature along with stereochemistry of structures of the drug from CNS, ANS, Analgesics, NSAIDS as stated .
			CO2-Relate Structural activity relationship of the drug from CNS, ANS, Analgesics, NSAIDS as stated.
			CO3- Illustrate mechanism of action of the drug from CNS, ANS, Analgesics, NSAIDS and Steroidal agents as stated .
			CO4-Describe synthesis with help of reactions involved for selected drugs in CNS ,ANS, Analgesics , NSAIDS.
			CO5-Predict different metabolite of drug and its structure and ultimate effect on drug profile.
			CO6- Recognize Chemical Class of drugs depending upon chemical, target based and therapeutic classification of drugs belonging to CNS ,ANS, Analgesics , NSAIDS stated in syllabus.
2.	Pharmaceutics-IV	BPH_C_802_T	**CO1-**Knowledge of sterile technology in designing safe and effective injectables and ophthalmic products.
			CO2-Describe the rationale for oral SR/CR products, principle of design, development and evaluation of SR formulations.
			CO3-Remember the concept of Microencapsulation and NDDS.
			CO4- Discuss the concept of validation and pilot plant scale up for large scale manufacturing operations.
			CO5- Describe the concept of biopharmaceutics and significance of various pharmacokinetic operations.
3.	Clinical Pharmacy	BPH_E_807_T	**CO1-**Relate the role of pharmacist in different setups like clinics, pharmacies and in the community.

			CO2-Identify the crucial role of pharmacists in patient counselling, drug adherence and compliance to therapy.
			CO3-Discuss Adverse drug reactions types, monitoring, reporting, drug interactions & therapeutic drug monitoring.
			CO4-Discuss the drugs used in Geriatrics, Paediatrics & pregnancy.
			CO5- Outline the process of drug discovery and development with related Ethical Guidelines/Schedules, essential documents in clinical trials/research.
			CO6-Identify and analyse the trends in drug use to optimize health outcomes through pharmacoepidemiology & Pharmacoeconomics
4.	Novel drug delivery system	BPH_E_811_T	**CO1-**Enlist NDDS for different routes such as oral, transdermal, ocular, transmucosal and implantable.
			CO2-Explain the need and concepts of targeting and active & passive targeting.
			CO3- Elaborate the principles behind the targeting systems for brain, colon, lymphatics and tumours.
			CO4-Discuss the methods for preparation, evaluation test of multiarticulate systems for targeting.
			CO5- Apply your knowledge for the formulation of NDDS dosage forms
5.	**Pharmaceutical chemistry lab-II**	BPH_C_803_L	CO1- Design and perform unit operations like weighing , filtration, drying ,reflux etc.
			CO2-Examine reaction intermediate and final product formation by IR and TLC.
			CO3- Understand basic principle and reaction mechanism behind organic synthesis.
			CO4-Apply concept of green chemistry and techniques of waste management
			CO5-Remove unwanted impurities by recrystallization technique
6.	Pharmaceutics lab-IV	BPH_C_804_L	CO1-Demonstrate the intricacies of formulation and development of parenteral and ophthalmic products.
			CO2-Perform quality control test for the manufactured products

			CO3-Prepare documents for the manufacturing process
			CO4-Perform the pharmacopeial tests for these products and their packaging materials.
			CO5-Explain the concept of dissolution testing as an important quality control tool and relate to its importance from regulatory point of view.
			CO6-Apply pharmacokinetic principles of oral routes of administration
			CO7-Demonstrate oral and written communication skills and ability to plan the experimentation with proper time management