THIRD YEAR B.PHARMACY COURSE OUTCOMES (2019 PCI Pattern)

Subject Code	Subject	Course Outcome Number	Course Outcome
BP501T	Medicinal Chemistry-I	**The studentswill be able to**	
		1	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.
		2	Memorize chemistry of prostaglandin and prostanoids.
		3	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.
		4	Elaborate the chemical structure and biological activity of various categories of steroidal drugs and antithyroidal agents.
		5	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
BP502T	Industrail Pharmacy-I Theory	**The students will be able to**	
		1	Understand the concepts of dosage form design & formulation strategies.
		2	Explain tablets as a dosage for manufacture & evaluation, equipments, defects in tableting & remedies,coating, manufacture, evaluation and packaging of different liquid dosage forms.
		3	Explain capsules, types, additives, size selection, manufacturing equipments, defects & evaluation, and also formulation requirements, pelletization process, equipments for manufacture of pellets.
		4	Explain different types, preformulation, formulation , containers, evaluation of parenterals and ophthalmic preparations with production facilities and controls and aseptic processing.
		5	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
		The students will be able to	
		1	Discuss Pharmacotherapy of Cardiovascular disorders and Cardiovascular Shock.

BP503T	**Pharmacology II – Theory**	**2**	Explain Diuretics and anti-diuretics
		3	Explain Autacoids and related drugs
		4	Describe Drugs acting on endocrine system
		5	Explain and demonstrate Bioassay
BP504T	**Pharmacognosy and Phytochemistry II– Theory**	**The students will be able to**	
		1	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.
		2	Apply basic concept of drug receptor interaction in various drug actions.
		3	Relate between the chemical structure and biological activity of various categories of cholinergic agonists and antimuscarinic agents.
		4	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.
		5	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. .
BP505T	**Pharmaceutical Jurisprudence – Theory.**	**The students will be able to**	
		1	Apply purification techniques of solvents by Fractional distillation and vacuum distillation.
		2	Synthesize acid and basic salts of drugs and evaluate their physicochemical properties.
		3	Determine the partition co-efficient and dissociation constant of various compounds.
		4	To apply thin layer chromatography and column chromatography technique for purification of synthesized compounds.
		5	Synthesize medicinal drugs and theirs intermediates.
BP506P	**Industrial Pharmacy-I - Practical**	**The students will be able to**	
		1	State the correct use of various equipments in pharmaceutics laboratory relevant to tablets, capsules, injections and ophthalmic preparations.
		2	Design and carry out formulation of granules, tablets, capsules and evaluation
		3	Design and carry out formulation of injectable preparations
		4	Design and carry out formulation of ophthalmic preparations and evaluation.
		5	Design and carry out formulation of cosmetic preparations and evaluation.
		6	Carry out evaluation of Glass containers

BP507P	**Pcolgy-II Pr.**	**The students will be able to**	
		1	Discuss physiological salt solutions, drug solution and use of molar solution in various animal experiments.
		2	Demonstrate effect of various drugs on heart rate, blood pressure in heart and on rabbit eye by using software.
		3	Demonstrate bioassay of matching, graphical, three point and four point method and DRC, PA2, PD2 Value using suitable isolated tissue preparations
		4	Demonstrate Anti-inflammatory activity of drugs using carrageenan induced paw-edema model
		5	Demonstrate effect of spasmogens and spasmolytics using rabbit jejunum.
		6	Demonstrate Analgesic activity using hotplate method
		7	Demonstrate Anti allergic activity by mast cell stabilization assay
		8	Demonstrate Clinical Case study and dose calculation
BP508P	**Pharmacognosy and Phytochemistry II – Practical**	**The students will be able to**	
		1	Students are able to discuss the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents.
		2	Students are able to discuss the production of Phytoconstituents /herbal formulation
		3	Students are able to explain the metabolic pathways in formation of secondary metabolites and application of biogenetic studies.
		4	Students are able to demonstrate isolation and identification of phytoconstituents.
BP601T	**Medicinal Chemistry III – Theory**	**The students will be able to**	
		1	Students are able to understand raw material as source of herbal drugs from cultivation to herbal drug products.
		2	Students are able to know the WHO and ICH guidelines for evaluation of herbal drugs.
		3	Students are able to know the herbal cosmetics, natural sweeteners, nutraceuticals.
		4	Students are able to understand & appreciate patenting of herbal drugs, GMP.
BP602T	**Pharmacology III – Theory**	**The students will be able to**	
		1	Discuss Pharmacology of drugs acting on Respiratory system
		2	Discuss Pharmacology of drugs acting on the Gastrointestinal Tract
		3	Explain Chemotherapy
		4	Describe Immunopharmacology
		5	Explain Protein drugs, monoclonal antibodies, target drugs to antigen, biosimilars
		6	Describe Principles of toxicology
		The students will be able to	

BP603T	**Herbal Drug Technology – Theory**	**1**	Apply basics of API industry and chemical process kinetics with respect to various classes of reactions for manufacturing of API.
		2	Manufacture API utilizing knowledge of chemical process, reaction system, equipments used and layout design.
		3	Categorize and optimize synthetic routes of reactions by selecting proper raw material and reagents, scale up techniques and considering quality control aspects, safety and environmental aspects and green chemistry approaches .
		4	Apply the chirality and polymorphism concept in manufacturing of some important APIs.
		5	Practice Quality Assurance (QA), Quality Control (QC) and follow GMP in API manufacturing including ICH Q7, Q7A and Q11 while working in API industry.
BP604T	**Biopharmaceutics and Pharmacokinetics – Theory**	**The students will be able to**	
		1	Understand the concept of biopharmaceutics and relate different factors, types, mechanisms of absorption, distribution.
		2	Understand different factors, types, mechanisms of elimination.
		3	Distinguish the clinical significance of bioavailability, bioequivalence.
		4	Justify the importance of one compartment model in the study of pharmacokinetics.
		5	Justify the importance of two compartment model in the study of pharmacokinetics.
		6	Interpret the non- linearity along with its significance and outline the applications of pharmacoki
BP605T	**Pharmaceutical Biotechnology – Theory**	**The students will be able to**	
		1	Recognize the importance, scope & applications of Pharmaceutical biotechnology and to elaborate applications and methods of enzyme immobilization techniques etc.
		2	Explain the information about the techniques of genetic engineering along with applications in production of pharmaceuticals.
		3	Elaborate different types and structures of immunizing agents with preparation and storage of vaccines and monoclonal antibodies along with their importance in industries.
		4	Explain the use of microorganisms in fermentation technology
BP606T	**Quality Assurance – Theory**	**The students will be able to**	
		1	Apply the various aspects of Quality Assurance, Quality Control, Total Quality Management and quality certifications to pharmaceutical industry.
		2	Implement concepts of Good Laboratory Practices, Quality Control tests in pharmaceutical industry.
		3	Maintain, retain and retrieve documents in pharmaceutical industry.
		4	Demonstrate laboratory skills to perform calibration and validation.

BP607P	**Medicinal chemistry III – Practical**	**The students will be able to**	
		1	Demonstrate laboratory skills to separate and determine R_f values of mixture of amino acids, carbohydrates by paper and thin layer chromatography.
		2	Perform validation of spectrophotometric assay methods as per ICH guidelines.
		3	Summarize principle involved in Column chromatographic separation and HPTLC techniques.
BP608P	**Pharmacology III – Practical**	**The students will be able to**	
		1	Demonstrate anti-ulcer activity of a drug using pylorus ligand (SHAY) rat model and NSAIDS induced ulcer model.
		2	Demonstrate effect of drugs on gastrointestinal motility and Effect of agonist and antagonists on guinea pig ileum
		3	Explain estimation of serum biochemical parameters by using semi- autoanalyser and effect of saline purgative on frog intestine
		4	Explain hypoglycemic effect of insulin in rabbit and Test for pyrogens (rabbit method)
		5	Explain determination of acute oral toxicity (LD50) of a drug from a given data and determination of acute skin irritation / corrosion of a test substance
		6	Demonstrate demonstrate acute skin irritation and acute eye irritation for corrosive test substances and calculation of pharmacokinetic parameters from a given data
		7	Explain Biostatistics methods
		8	Demonstrate Bioassay of serotonin using rat fundus strip by three point bioassay and bioassay of acetylcholine using rat ileum/colon by four point bioassay.
		9	Demonstrate mydriatic and miotic effects on rabbit eye.
BP609P	**Herbal Drug Technology – Practical**	**The students will be able to**	
		1	Understand evaluation of excipients of natural origin.
		2	Discuss preliminary phytochemical screening of crude drugs.
		3	Understand preparation & standardization of extract in cosmetic formulations like creams, lotions and shampoos and their evaluation
		4	Understand preparation & standardization of extract in formulations like syrups, mixtures and tablets and their evaluation as per Pharmacopoeial requirements.
		5	Determine aldehyde, phenol & alkaloid content.

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