PSG COLLEGE OF PHARMACY

2.6.1. COURSE OUTCOME

Course outcome for B Pharm (Nonsemester)

Course Code	Name of the Course & Course outcome	
1.1	**Pharmaceutical Inorganic Chemistry**	
	CO1	Basic knowledge on chemistry periodic table ,Pharmacopoeia, Monographs and Preparation different strength of solutions
	CO2	Know about Quality control test , sources of impurities, Limit test.
	CO3	Radio activity and its measurement Properties of α, β and γ rays -Half life-Precaution and storage Pharmaceutical applications.
	CO4	Method of preparation, assay, identification test and uses of inorganic compounds
	CO5	Theory of co-ordination compounds and its application in pharmacy
1.2	**Pharmaceutical Organic Chemistry**	
	CO1	Graduates will acquire an adequate knowledge in nomenclature, structure, preparation, isomerism and physical properties of certain important classes of organic compounds which imparts a foundation for the future study of various medicinal compounds.
	CO2	Benzene structure, Chemistry Resonance Huckel's rule, Electrophilic and nucleophilic aromatic substitution Reactivity Orientation Stability. This will result in students developing correct strategies for drug synthesis involving aromatic systems.
	CO3	The mode of quality control procedures and applications of numerous medicinal agents help to adapt the students to focus on purity parameters pertaining to the drugs of choice.
	CO4	Mechanisms for (SN_1 &SN_2, E_1 & E_2) reactivity orientation and stability of the compounds generating newer products and intermediates can be correlated with novel drug design and development in future.
	CO5	The practical knowledge from the laboratory synthesis of medicinal organic molecules and their qualitative organic analysis helps to interpret and arrive to valid conclusions about the organic samples.
1.3	**Anatomy, Physiology and Health Education**	
	CO1	Knowing the basic terminologies and terms in anatomy, physiology & health education Understanding the cyto-morphology, functions, transport, conduction mechanism and electrical stimulation
	CO2	Able to explain the tissue level structure, bones, hematological, lymph, cardiovascularsystem, GIT struture and functions, Lung physiology and ductless glands and its disorders.
	CO3	Gain knowledge and awareness on renal parameters and its functions and gain basic functions, principle of conduction of the brain and its accessory structures.
	CO4	Able to explain the voluntary and involuntary actions, receptors, neurotransmitters

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		and its functions of ANS,Understanding and explain the functions of eye, ear, nose, tongue and skin and reproductive system.
	CO5	Gaining basic knowledge on health and hygiene, basic concepts of food and related diseases, basic concepts of disease and its management, first aid and life saving measures and birth control techniques and preventive measures
1.4	**Bio-chemistry**	
	CO1	To understand the bioenergetics value for all biochemical compounds
	CO2	To understand the metabolism of biomolecules in physiological and pathological conditions
	CO3	To understand the biochemical role of hormones in human physiology
	CO4	To understand the genetic organization of mammalian genome & functions of DNA in synthesis of proteins
	CO5	To study about mineral metabolism and nutritive values of biomolecules
1.5	**Biostatistics and Computer Applications**	
	CO1	know the various types of application of computers in pharmacy
	CO2	2. know the various types of databases
	CO3	3. know the various applications of databases in pharmacy
2.1	**Physical Pharmaceutics**	
	CO1	understand the basic concepts diffusion, dissolution and surface properties of ingredients in the designing the dosage forms
	CO2	know the various basic and bulk properties of powder and liquids in manufacturing of pharmaceutical products
	CO3	able to use the principles of chemical kinetics for stability testing and determination of expiry date of formulations
	CO4	understand the application of pH, buffer, isotonic solution, complexation in pharmaceutical sciences
	CO5	able to use the physicochemical properties in the formulation development
2.2	**Pharmaceutical Analysis and Physical Chemistry**	
	CO1	Importance of quality control, computation of analytical results, learns to predict the sources of errors and know to perform calibration of apparatus
	CO2	Understand concepts of titrations and perform different titrations such as acid base, precipitation titration and estimation of metal ions
	CO3	Know about determining the concentration of analyte by causing a redox reaction, quantitative determination of analytes using gravimetric analysis and estimation of gases, lipids
	CO4	Gain basic knowledge about types of solutions, properties, Laws of thermodynamics, and thermochemistry.

	CO5	Able to understand the principle behind adsorption, catalyst, rate of chemical reaction and know about polarimetry, refractometry and its applications.
2.3	**Advanced Pharmaceutical Organic Chemistry**	
	CO1	To obtain knowledge on stereo chemical aspects of organic compounds
	CO2	To emphasize and learn the important named reactions along with mechanism
	CO3	To develop sufficient knowledge in synthesis and chemistry of important heterocyclic compounds
	CO4	To understand the medicinal uses & other applications of natural products
	CO5	To understand the methods of preparation , chemistry and SAR of Natural products
2.4	**Pharmaceutical Technology**	
	CO1	To learn the materials used in pharmaceutical plant construction including glass, SS, along with its composition and corrosion, humidification and dehumidification control with its measurements & Industrial hazards and its safety measures for its prevention
	CO2	Ability to understand the relationship between pressure and fluid flow and its measurements. Understand various mechanisms of size reduction and separation based on size, shape and density
	CO3	To learn the operations of filtration and centrifugation process of pharmaceutical products along with utilizing equipments. Understand its application in preparing sterile dosage forms. The crystal developing process and its characters.
	CO4	Basic understanding of mechanism of heat transfer. Ability to understand the operation and principles of various evaporators and distillation. Understand the separation of compounds based on difference in boiling point
	CO5	Understand the significance of drying in pharmaceutical product. Ability to understand the operation and principles of drying units. Application of mixing in solid & liquid dosage forms such as tablet, capsules, and syrups.
2.5	**Pharmacy Practice and Pathophysiology**	
	CO1	Identify and handle the prescription. Determine the factors affecting dose of a drug and work out various calculations related to dispensing.
	CO2	Distinguish, prepare & dispense prescriptions containing various types of dosage forms. Identify & rectify the incompatibilities found in the prescription.
	CO3	Establish the professional ethics and their role in the development of community health care & education. Gain knowledge on various surgical supplies.
	CO4	Explain comprehensively the basic mechanisms involved in cell injury, repair & adaptation.
	CO5	Elaborate the molecular mechanism involved in the pathophysiology of communicable & non-communicable diseases.

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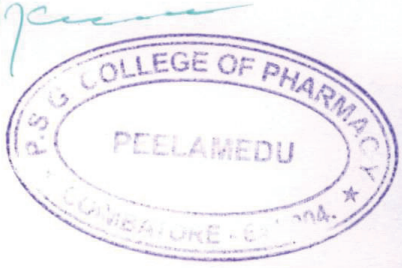
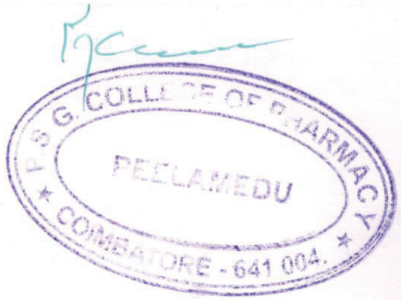
3.1	**Pharmacognosy and Phyto chemistry**	
	CO1	To know the introduction on pharmacognosy and its classification based on different category of source of crude drugs. Quality control techniques involved in detection of adulterants of herbal drugs as per regulatory guideline
	CO2	To know the techniques in the cultivation, collection process and its factors affecting the production of crude drugs along with natural pesticides
	CO3	To know the sources, macro & micro diagnostic characters, phytochemical nature, therapeutic / commercial utilization of primary phytoconstituents present in various crude drugs
	CO4	To know the sources, macro & micro diagnostic characters, phytochemical nature, therapeutic /commercial utilization of secondary phytoconstituents present in various crude drugs
	CO5	To know the sources, diagnostic characters, phytochemical nature, therapeutic /commercial utilization of pharmaceutical aids such as mineral origin and fibres.
3.2	**Medical Chemistry – I**	
	CO1	CO1: Basic understanding of factors involved in Drug Distribution and transport and the molecular and chemical properties affecting them.
	CO2	CO2: Understanding of the ANS and the workings of the Sympathetic nervous system and their use in Cardiovascular and bronchial ailments and the principles involved in them. Also, the relationship of structure to activity
	CO3	CO3: Understanding of the ANS and the workings of the Parasympathetic nervous system and their use in Cardiovascular and bronchial ailments and the principles involved in them.Also, the relationship of structure to activity
	CO4	CO4: Understanding of the CNS and the various mental ailments of pyschosis and depression and the various drugs used in treating them and the logic behind using them. Also, the relationship of structure to activity.
	CO5	CO5: Understanding of the CNS and the conditions epilepsy and anesthesia and the various drugs deployed in this regard and the logic behind using them. The study of inflammatory pathways and various agents used to counter inflammation. Also, the relationship of structure to activity.
3.3	**Pharmaceutical Dosage Forms and Cosmetic Technology**	
	CO1	Knowledge on drugs formulation and evaluation of liquids for internal & external as well as topical semisolid formulations.
	CO2	Knowledge about evaluation and design of dosage form for body cavities and preparation of blood products.

	CO3	Idea on how to select packaging material according to norms and knowledge on cosmetics formulation as well as evaluation.
	CO4	Knowledge on formulation, plant design and evaluation of sterile dosage forms, and Pharmaceutical GMP, QA.
	CO5	
3.4	**Pharmacology – I**	
	CO1	The students will be capable of explaining the basics of pharmacology like drug, agonists & antagonists, pharmacokinetics & dynamics, receptors & its families, routes of drug administration, bioassays, and basic clinical pharmacokinetics.
	CO2	The students will understand the sympathetic and parasympathetic divisions of ANS, various receptors, neurotransmitters in the ANS and pharmacology of drugs acting in it and local anesthetics.
	CO3	The students will understand the various CNS diseases and the pharmacology of drugs acting on central nervous system like sedative & hypnotics, anticonvulsants, general anesthetics psychopharmacological agents etc.
	CO4	The students will know the pharmacological management of various cardiovascular disorders like hypertension, angina, arrhythmia and therapy of shock etc.
	CO5	The students will understand the fluid and electrolyte balance and pharmacology of diuretics & anti-diuretics and drugs acting on reparatory tract like bronchodilators, expectorants, anti-tussives etc.
3.5	**Hospital and Clinical Pharmacy**	
	CO1	Knowledge in hospital, hospital pharmacy, committees & the policies of hospital
	CO2	To know the purchase& distribution of pharmaceuticals, management of central sterile supply department and Radiopharmaceuticals
	CO3	Knowledge in answering drug information query, drug related problems& Patient medication counseling
	CO4	Understand the ethics in clinical research and knowledge in clinical trials
	CO5	Knowledge in Therapeutic drug monitoring of specific drugs for dosage individualization
3.6	**Pharmaceutical Biotechnology**	
	CO1	Understand the importance of microorganisms, able to cultivate, identify and preserve microorganism.
	CO2	Apply the knowledge of sterilization and disinfection process in pharmaceutical industry.
	CO3	Understand the immune mechanism and employ it for the production of immunological products
	CO4	Apply the genetic engineering knowledge for the production of rDNA products
	CO5	Sketch various process involved in the fermentation technology and apply them in the production of pharmaceutical products
4.1	**Formulative Pharmacy and Bio-Pharmaceutics**	
	CO1	able to use the concepts of preformulation and stabilty testing in



		development of pharmaceutical dosage forms
	CO2	know the various excipients and manufacturing techniques used in solid dosage forms
	CO3	know various manufacturing techniques of capsules and encapsulation of drugs
	CO4	understand various approaches for development of novel drug delivery systems.
	CO5	able to use the basic concepts of biopharmaceutics and pharmacokinetics
4.2	**Advanced Pharmacognosy**	
	CO1	To learn the biogenesis, laboratory and industrial isolation, identification and PTC techniques of secondary metabolites
	CO2	To learn the traditional system of medicine, the formulations belongs to the system and standardization techniques
	CO3	To know the enzymes of natural origin, isolation, allergens, teratogenic plants and traditional drugs
	CO4	To know the preparation of tinctures, herbal syrups and other herbal formulations along with WHO guidelines for the assessment of herbal medicines
	CO5	To learn the biosynthesis of antibiotics and antivirals of natural origin and its specific utilization
4.3	**Pharmacology-II**	
	CO1	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases in different categories of drugs.
	CO2	Appreciate the correlation of pharmacology with other biomedical sciences.
	CO3	Demonstrate the isolation of different organs/tissues from the laboratory animals by simulated experiments and demonstrate the various receptor actions using isolated tissue preparation
	CO4	Explain the mechanism of drug action at the organ system / subcellular/ macromolecular levels.
	CO5	Understand the basic concepts, pre-clinical trials, design of clinical trials phases of clinical trials and new drug discovery process.
4.4	**Modern methods of Pharmaceutical Analysis**	
	CO1	Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis using various analytical instruments
	CO2	Develops ability to involve in the quantitative & qualitative chromatographic separation and analysis of drugs
	CO3	It facilitates the students to perform the voltametric titration of drugs using different instruments
	CO4	Understand the principles of Nmr, Mass, X Ray Techniques and assays
	CO5	Able to do the calibration and validation of instruments and understand the importance of documentation
4.5	**Medicinal Chemistry-II**	
	CO1	To Gain the Knowledge about Principles of Drug Design through QSAR, CADD & Molecular Modeling



	CO2	To Learn The Classification, Mechanism Of Action, Synthesis & Other Medicinal Chemistry Properties Of Drugs Against Virus, Bacteria, Parasites And Cancer Cells.
	CO3	To develop required knowledge about drugs acting on CVS & blood vessels
	CO4	To understand biological actions & uses of hormones & steroidal related drugs
	CO5	To learn about different diagnostic reagents & combinatorial chemistry
4.6	**Pharmaceutical Jurisprudence and Pharmacy Business Management**	
	CO1	They should know about the scope, role of pharmacist in drug treatment, drug usage. Pharmacist as a member of health care team.
	CO2	The Pharmaceutical legislations and their implications of pharmaceutical education in India and its present status. The code of ethics and legal responsibilities of Pharmacy professional practice.
	CO3	The regulatory authorities and agencies governing for import, manufacture, sales, and analysis of drugs. Administration of the Act, schedules, labeling & packing guidelines. Constitution and function of TNPC, PCI & ER. Detailed study and function of Excise duties act, Dangerous drug act, Advertisement act and MTP act. The members & functioning of IAEC and CPCSEA guidelines. DPCO for price fixing and NLEM. Patents, procedure for patent application and IPR
	CO4	Principle and concept of Management. Identification of key points to give maximum thrust for development of marketing
	CO5	Functions and evaluation of pharmaceutical marketing to improve the salesmanship.