Gokhale Education Society's
Sir Dr. M. S. Gosavi College of Pharmaceutical Education & Research,
Nashik, Maharashtra-422005

COURSE OUTCOMES (COs) ACADEMIC YEAR 2022-23 (TERM-II)

FIRST YEAR B. PHARM

Course: Human Anatomy And Physiology -II(BP201T)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOME(s)
CO1	Knowledge of the gross morphology, structure and functions of various organs of the human body.
CO2	Understanding of the various homeostatic mechanism and their imbalances.
CO3	Differentiate between the various tissues and organs of different systems of human body.
CO4	Understand the related knowledge of special senses and nervous system.
CO5	Understanding the co-ordination and working pattern of different organs of each system.

Course: Human Anatomy And Physiology II (BP 207P)

On successful completion of course, learner shall able to

SR NO.	COURSE OUTCOME(s)
CO 1	Understand physiology of sense organs.
CO 2	Explain and discuss importance of endocrine system in maintenance of homeostasis and continuity of life.
CO 3	Relate the influence of hypnotic, hypertonic and isotonic solution on cellular integrity of red blood cells (RBCs)
CO 4	Analyze and conclude physiology of autonomic nervous system (ANS) and central nervous system (CNS).
CO 5	To count the platelet ,DLC and neutrophils and its significance.
CO 6	Study of different systems of human body with specimen.
CO 7	Determination of various test to check homeostasis.
CO 8	Introduction of family planning devices and pregnancy diagnosis test and observe slides.

Course: Pharmaceutical Organic Chemistry -I (BP202 T)

On successful completion of course, learner shall able to

SR NO.	COURSE OUTCOME(s)
CO 1	Understand and explain the concepts of hybridization, electronic and steric effects of organic molecules, stereochemistry and appreciate the chemistry of hydrocarbons.
CO 2	To write the structure, name and type of isomerism of organic compounds.
CO 3	Acquire knowledge about preparation and reactivity of compounds with functional groups, such as Alkanes, Alkenes, Alkyl halides, Aldehydes, and Ketones, Carboxylic acids, Alcohols and Amino compounds.

CO 4	Explain the mechanism involved in the substitution, addition, nucleophilic and elimination reactions.
CO 5	To study the reactivity/ stability of compounds.
CO 6	Identify and study the structure and uses of organic compounds.

Course: Pharmaceutical Organic Chemistry -I(BP 208P)

On successful completion of course, learner shall able to

SR NO.	COURSE OUTCOME(S)
CO 1	To study various safety measures in an Organic Chemistry Laboratory.
CO 2	To develop the skill of purification technique for organic compounds.
CO 3	To study the Systematic Qualitative Analysis of Unknown Organic Compounds.
CO 4	To understand the reaction and its mechanism involved in preparation of derivatives.
CO 5	To develop the skill for construction various Molecular Models.

Course: Biochemistry I(BP203T)

On successful completion of course, learner shall able to

SR NO.	COURSE OUTCOME(S)
CO 1	To understand the molecular levels of chemical nature and biological role of cell, cell organelles and various metabolic processes of carbohydrates, lipids and amino acid in cell metabolism.
CO 2	Elaborate the catalytic role of enzymes and importance of enzymes in biochemical process and its applications.
CO 3	To understand the genetic organizationn and functions of DNA/RNAS, synthesis and break down of purines and pyrimidines in nucleic acid metabolism and proteins.
CO 4	Illustrate the concept of free energy, endergonic and exergonic reaction and biological significance of ATP and cAMP.

Course: Biochemistry I(BP 209 P)

On successful completion of course, learner shall able to

SR NO.	COURSE OUTCOMES
CO 1	Analyze and estimate protein, amino acid, carbohydrate from given sample by qualitative, quantitative test.
CO 2	To analyze urine for abnormal constituents by qualitative analysis.
CO 3	To study blood creatinine, blood sugar, and serum total cholesterol.
CO 4	To know mechanism of action of salivary amylase on starch
CO 5	To study buffer solution and measurement of pH.

Course: Pathophysiology I (BP 204 T)

On successful completion of course, learner shall able to

Sr NO.	COURSE OUTCOMES
CO 1	Explain the biochemical mechanisms responsible for cell injury and inflammation.
CO 2	Describe the etiology and pathogenesis of the selected disease states.
CO 3	Elaborate the rationale and theoretical basis for methods used in the diagnosis of common biochemical disorders.

Course: Computer Application in Pharmacy (BP 205 T)

On successful completion of course, learner shall able to

SR NO.	COURSE OUTCOMES
CO 1	Understand basic principles of computer and number system of computer.
CO 2	Know the various types and application of computers in pharmacy.
CO 3	Acquire the knowledge about various types of databases, software's, web technologies.
CO 4	Know the various applications of databases in pharmacy
CO 5	Able to understand bioinformatics and impact of bioinformatics in vaccine discovery.

Course: Computer Application in Pharmacy (BP 210P)

On successful completion of course, learner shall able to

SR NO.	COURSE OUTCOMES
CO 1	Design set of questionnaire, create HTML web page, mailing labels in lable wizards.
CO 2	Retrieve drug information using online tool, create database in MS Access.
CO 3	Create report and printing report from patient's database
CO 4	Create invoice table and drug information retrieval using MS Access
CO 5	Create queries in MS Access, export queries, tables, forms, report in web and XML page.

Course: Environmental Science (BP 206 T)

On successful completion of course, learner shall able to

SR NO.	COURSE OUTCOMES
CO 1	Clarify basics of environment like ecology, ecosystem, food chain, food web and ecological pyramids.
CO 2	Understand the current problems of environment and how to solve them..
CO 3	Know and aware about factors of environmental pollution and hazards of disposal wastes from hospitals and pharmaceutical industries.
CO 4	Know the role of individual in conservation of natural resources and effort to save the environment

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COURSE OUTCOMES (CO) ACADEMIC YEAR 2021-22 (TERM-II)

SECOND YEAR B. PHARM

Course: Pharmaceutical Organic Chemistry III (BP 401 T)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Understand the methods of preparation and properties of organic compounds.
CO 2	Explain the stereochemical aspects of organic compounds and stereo chemical reactions.
CO 3	Know the medicinal uses and other applications of organic compounds
CO 4	Explain Reaction mechanism of name reaction

Course: Medicinal Chemistry (BP 402 T)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Summarize History and development of medicinal chemistry.
CO 2	Correlate physicochemical properties with biological action and metabolism of drugs.
CO 3	Understand the chemistry with respect to their pharmacological activity,drug metabolic pathways, adverse effect and therapeutic value of some CNS and PNS active drugs.
CO 4	Know the Structural Activity Relationship (SAR) of different classes of some CNS and PNS active drugs.
CO 5	Write the chemical synthesis of some drugs.

Course: Medicinal Chemistry (BP 406 P)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Demonstrate synthesis and purification of selected drugs and drug intermediate.
CO 2	Illustrate the chemical reaction and reaction mechanism involved in synthesis.
CO 3	Perform TLC for monitoring of reaction and purification of synthesized compound by column chromatography.
CO 4	Determine partition coefficient and ionization constant for organic compound.

Course: Physical Pharmaceutics (BP 403 T)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Understand the basics of dispersed system, its properties, types & different parameters affecting to colloidal dispersions; basics of deformation of solids.
CO 2	Summarize different types of flow, its application in formulation & determination of viscosity by using different viscometers.
CO 3	Outline the physical, physicochemical properties, principles & stability involved in biphasic dosage form.
CO 4	Understand the properties of particles & pharmaceutical powders, their significance in formulating pharmaceutical products & the common methods for characterizing their properties.
CO 5	Define reaction kinetics, reaction order & discuss factors affecting the rate of reaction; describe the degradation & stabilization of medicinal agents as well as accelerated stability testing.

Course: Physical Pharmaceutics (BP 407 P)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Calculate sedimentation volume, viscosity, reaction rate constant, cloud point, Krafft point, and particle size distribution, relative strength of two acids, energy of activation.
CO 2	Evaluate viscosity, particle size, particle size distribution, and derived properties of any material.
CO 3	Understand effect of salts on stability of hydrophobic sols and concept of accelerated stability studies.

Course: Pharmacology (BP 404 T)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Understand general pharmacology including pharmacokinetics and pharmacodynamics.
CO 2	Get in-depth knowledge of adverse drug reactions, drug interactions, drug discovery process and pharmacovigilance.
CO 3	Understand pharmacological actions of drugs acting on Peripheral Nervous system.
CO 4	Explain pharmacological actions of drugs acting on Central Nervous system.

Course: Pharmacology (BP 408 P)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Understand concept and instruments used in experimental pharmacology.
CO 2	Explain various common laboratory animals.
CO 3	Understand CPCSEA guidelines, Common laboratory techniques, routes of drugs administration in experimental animals.
CO 4	Demonstrate the effects of various drugs on animals by simulated techniques.

Course: Pharmacognosy and Phytochemistry I (BP 405 T)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Introduction to Pharmacognosy including quality control and classification of drugs.
CO 2	Study of Cultivation, collection, processing, storage and conservation of drugs of natural origin.
CO 3	Discuss about plant tissue culture and edible vaccines.
CO 4	Study of Morphology and anatomy of various parts of plants.
CO 5	Study of primary and secondary metabolites of plants including plant products and marine drugs.

Course: Pharmacognosy and Phytochemistry I(BP 409 P)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Make use of charts for chemical tests of unorganized drugs.
CO 2	Explain identification of powdered crude drug
CO 3	Analyze the plants samples on the basis of physico-chemical parameters
CO 4	Explain quantitative microscopy of crude drug..
CO 5	Explain evaluation techniques for herbal drugs.

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COURSE OUTCOMES (CO) ACADEMIC YEAR 2021-22 (TERM-II)

THIRD YEAR B. PHARM

Course: Medicinal chemistry III (BP 601 T)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Describe classification, nomenclature, structure activity relationship, mechanism of action, adverse effects, therapeutic uses and recent developments in Antibiotics and antimalarial drugs.
CO 2	Describe classification, nomenclature, Chemistry, structure activity relationship, mechanism of action, adverse effects, therapeutic uses and recent developments in Antimycobacterial, Antiviral agents, and Synthetic anti-infective agents.
CO 3	Discuss adverse effects, therapeutic uses and recent developments in adverse effects, therapeutic uses and recent developments in antineoplastic agents.
CO 4	Study the chemical synthesis of selected drugs.
CO 5	Illustrate the importance of drug design and different techniques of drug design.

Course: Medicinal chemistry III (BP 607 P)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Synthesize and explain reaction mechanisms involved in synthesis of medicinally important compounds and purify them.
CO 2	Learn and extend alternative green chemistry methods like microwave assisted synthesis in synthesis of different compounds.
CO 3	Demonstrate the ChemDraw software for drawing structure and reaction
CO 4	Determine physicochemical properties
CO 5	Understand the process of drug design using software.

Course: Pharmacology III (BP 602 T)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Discuss pharmacology of drugs acting on respiratory and gastrointestinal systems.
CO 2	Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases
CO 3	Understand the principles of toxicology and treatment of various poisonings.
CO 4	Appreciate correlation of pharmacology with related medical sciences.

Course: Pharmacology III (BP 608 P)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Demonstrate effects of various drugs (bioassay) on intact experimental animals or on isolated tissue/organ preparations using computer simulations.
CO 2	Estimate and justify the importance of different serum biochemical parameters.
CO 3	Explain the importance of toxicity studies and estimate LDso.
CO 4	Discuss different pharmacokinetic parameters and their estimation.
CO 5	Analyze the importance of biostatistics in experimental pharmacology.

Course: Herbal Drug Technology (BP 603 T)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Recall cultivation and collection practices of herbs and biodynamic agriculture.
CO 2	Understand the WHO and ICH guideline for evaluation of herbal drugs.
CO 3	Explain herbal Nutraceuticals, natural sweeteners, and herb-food and herb-drug interactions.
CO 4	Knowledge about preparation of herbal cosmetics and properties of herbal excipients and drugs.
CO 5	Explain traditional systems of medicines, special emphasis on Ayurveda &; itsformulations.
CO 6	Herbal drug patenting, Biopyracy, Traditional Knowledge, Farmers and Breeders Right, GMP.

Course: Herbal Drug Technology (BP 609 P)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Explain preparation and evaluation of herbal and Ayurvedic formulations.
CO 2	Identify suitable method for formulation of cosmetic preparations and their evaluation.
CO 3	Analyze and evaluate the marketed herbal and ayurvedic preparations.
CO 4	Detremination of total alakloids and annins and preliminary phytochemical evaluation.

Course: Biopharmaceutics and Pharmacokinetics (BP 604 T)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Students should be able to know the basics in Biopharmaceutics, BCS classification and its application in formulation development.
CO 2	Students should be able to describe pharmacokinetic processes, non-linear pharmacokinetics and their relevance in efficacy of dosage form.
CO 3	Students should be able to learn the concepts of Bioavailability and Bioequivalence studies and its applications in drug delivery system.
CO 4	Students should be able to understand various Compartment models and Non-compartment models.
CO 5	Students should be able to know the concepts and mechanisms of Dissolution and IVIVC.

Course: Pharmaceutical Biotechnology (BP 605 T)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Understand the importance Biotechnology, Enzyme immobilization and Protein Engineering in pharma industries.
CO 2	Understand the concept of genetic engineering, Recombinant DNA Technology.
CO 3	Explain Importance of Immunity, related principle and different techniques in industries
CO 4	Understand the use of microorganism in fermentation technology.

Course: Quality Assurance (BP 606T)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Understand concept of quality assurance, quality control, GMP, TQM, ISO, QbD, ICH etc.
CO 2	Explain role of regulatory agencies in deciding quality standards; NABL accreditation procedure.
CO 3	Describe role and application of cGMP, GLP & CPCSEA in Pharmaceutical industry; Quality control test of packaging materials.
CO 4	Acquire knowledge of document maintenance in pharmaceutical industry.
CO 5	Explain concept of validation, calibration and qualification.

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COURSE OUTCOMES (CO) ACADEMIC YEAR 2021-22 (TERM-II)

FINAL YEAR B. PHARM SEM II

Course: Biostatistics and Research Methodology (BP 801 T)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	To understand the applications of biostatistics in Pharmacy and Measures of central tendency and measures of dispersion and correlation.
CO 2	Explain the descriptive statistics, Graphics, Correlation, Regression and logistic regression.
CO 3	To understand Probability theory, Sampling technique, parametric tests and ANOVA.
CO 4	To understand the need of research and design of Experiments and experimental studies etc.
CO 5	To know the operation of M.S. Excel, SPSS, R and MINITAB®, DOE (Design of Experiment).
CO 6	To understand the design and analysis of experiments.

Course: Social and Preventive Pharmacy (BP 802 T)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Make use of charts for chemical tests of unorganized drugs.
CO 2	Explain identification of powdered crude drug.
CO 3	Analyze the plants samples on the basis of physico-chemical parameters.
CO 4	Explain quantitative microscopy of crude drug.
CO 5	Explain evaluation techniques fro herbal drugs.

Course: Pharmacovigilance (BP 805 ET)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Understand importance of drug safety monitoring.
CO 2	Explain History, development, National and international scenario of pharmacovigilance & comprehend dictionaries, coding and terminologies used in pharmacovigilance
CO 3	Understand detection and assessment of new adverse drug reactions, Adverse drug reaction reporting systems and communication in pharmacovigilance, Pharmacovigilance Program of India (PvPI) requirement for ADR reporting in India, ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning. CIOMS requirements for ADR reporting
CO 4	Comprehend methods of safety data during pre-clinical, clinical and post approval phases of drugs' life cycle.
CO 5	Write case narratives of adverse events and their quality.

Course: Cosmetic Science (BP 809 T)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	To know and explain about Cosmetic and cosmeceuticals products, concept of quasi and OTC drugs and basic study of hair, skin structure.
CO 2	To study of Principles, formulation and building blocks of skin, hair, oral care products.
CO 3	Importance's of herbal care products and sunscreen.
CO 4	Principles of Cosmetic Evaluation of skin colour, hair combing and there benefits
CO 5	To describe about basic Cosmetic problems associated with Hair, skin, oral care.

Course: Advanced Instrumental Techniques(BP 811ET)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOMES
CO 1	Understand the principles of analytical techniques and its application in analysis of drugs.
CO 2	Explain spectroscopic techniques of analysis including NMR spectroscopy, Mass spectrometry and X-Ray diffraction spectroscopy.
CO 3	Discuss working, principle and instrumentation various analytical techniques
CO 4	Calibration of important analytical instruments
CO 5	Give an account on hyphenated methods of analysis.

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COURSE OUTCOMES (CO) ACADEMIC YEAR 2021-22 (TERM-I)

FIRST YEAR M. PHARM

Course: Modern Pharmaceutical Analytical Techniques (MPAT 101 T)

On successful completion of course, learner shall able to

Sr No.	COURSE OUTCOME(s)
CO1	Explain different types of advanced analytical techniques for identification, characterization and quantification of drugs.
CO2	Illustrate principle, theory, instrumentation and applications of chromatographic methods used in separation, characterization and quantification of analytical samples.
CO3	Understand principle, theory and instrumentation of spectroscopic techniques and interpretation spectrum for identification and characterization of drugs.
CO4	Elaborate principle, theory, instrumentation and applications of thermal methods of analysis, X-ray crystallography and electrophoresis.

Course: Drug Delivery System (MPH102T)

On successful completion of course, learner shall able to

SR NO.	COURSE OUTCOME(s)
CO 1	Summarize the approaches in the development of novel drug delivery.
CO 2	Generalize the concept of personalized medicine
CO 3	Understand the mechanism of different drug delivery systems
CO 4	Suggest and execute different drugs and polymers in the development of novel drug delivery.
CO 5	Discuss formulation aspects in development of novel drug delivery systems.
CO 6	Execute evaluation techniques for testing novel drug delivery systems.

Course: Modern Pharmaceutics (MPH103T)

On successful completion of course, learner shall able to

SR NO.	COURSE OUTCOME(s)
CO 1	Elucidate components of preformulation studies
CO 2	Describe in depth about active pharmaceutical ingredients and generic drug product development
CO 3	Explain industrial management and GMP considerations
CO 4	Describe optimization techniques & pilot plant scale up techniques
CO 5	Know about stability testing, sterilization process & packaging of dosage forms

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Course: Regulatory Affair (MPH 104 T)

On successful completion of course, learner shall able to

SR NO.	COURSE OUTCOME(s)
CO 1	Understand the concept of Documentation of Pharmaceutical Industry, innovator and Generic drug and Drug Development Process.
CO 2	Explain Regulatory Guidelines for filing and approval process, preparation of Dossiers and their submission to Regulatory agencies in different countries.
CO 3	Understand CMC, post approval regulatory requirements for actives Drug Products, Combination product and medical devices, submission of Global documents in CTD and eCTD formats, ICH Guidelines and Regulatory Requirements of different Countries.
CO 4	Describe Non clinical Drug Development, Clinical Trial Requirements for approval and Conducting clinical trials, Pharmacovigilance and process of monitoring in clinical trials.
CO 5	Understand the concept of Documentation of Pharmaceutical Industry, innovator and Generic drug and Drug Development Process.

COURSE OUTCOMES (CO) ACADEMIC YEAR 2021-22 (TERM-II)

Course: Molecular Pharmaceutics (Nano Tech and Targeted) (MPH201T)

On successful completion of course, learner shall able to

SR NO.	COURSE OUTCOME(S)
CO 1	Understand various approaches for development of novel drug delivery systems
CO 2	Elucidate criteria for selection of drugs and polymers for the development of NTDS
CO 3	Describe formulation and evaluation of novel drug delivery systems

Course: Advanced Biopharmaceutics & Pharmacokinetics (MPH202T)

On successful completion of course, learner shall able to

SR NO.	COURSE OUTCOME(S)
CO 1	To understand the basic concepts in biopharmaceutics and pharmacokinetics.
CO 2	To undestand the use raw data and derive the pharmacokinetic models and parameters the best describe the process of drug absorption, distribution, metabolism and elimination.
CO 3	The critical evaluation of biopharmaceutic studies involving drug product equivalency.
CO 4	To Understand design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters

Course: Computer Aided Drug Development (MPH203T)

On successful completion of course, learner shall able to

SR NO.	COURSE OUTCOMES
CO 1	To explain the History of Computers in Pharmaceutical Research and Development.
CO 2	To illustrate Computational Modeling of Drug Disposition and use in Preclinical Development.
CO 3	To use CADD for Optimization Techniques in Pharmaceutical Formulation & biopharmaceutical characterization
CO 4	To apply Computers in Market Analysis & Clinical Development.

Course: Cosmetic & Cosmeceuticals (MPH204T)

On successful completion of course, learner shall able to

Sr NO.	COURSE OUTCOMES
CO 1	Explain the biochemical mechanisms responsible for cell injury and inflammation.
CO 2	Describe the etiology and pathogenesis of the selected disease states.
CO 3	Elaborate the rationale and theoretical basis for methods used in the diagnosis of common biochemical disorders.

Course: Computer Application in Pharmacy (BP 205 T)

On successful completion of course, learner shall able to

SR NO.	COURSE OUTCOMES
CO 1	Discuss key ingredients used in cosmetics and Cosmeceuticals
CO 2	State regulatory aspects related to cosmetics in India
CO 3	Discuss problems related to skin, hair, and oral cavity
CO 4	Execute cosmetics products for skin, hair, and oral cavity
CO 5	Discuss herbal cosmetics and formulation thereof