



Navsahyadri Institute of Pharmacy

(D. Pharmacy / B. Pharmacy)

Sr. No. 69, 70, 71, Naigaon (Nasarapur), Pune - 412 213

Approved by AICTE and PCI, New Delhi | Recognized by Govt. of Maharashtra and DTE, Mumbai | Affiliated to DBATU, Lonere and MSBTE, Mumbai



PROGRAM OUTCOMES (POs)

PO1	Pharmacy Knowledge	The Pharmacy graduates possess score and basic knowledge associated with the pharmaceutical and allied sciences.
PO2	Planning Ability	The Pharmacy graduates possess effective planning abilities including time management, resource management, delegation skills and organizational skills.
PO3	Problem Analysis	Develop an ability to solve, analyze and interpret data generated from Formulation Development, Quality Control & Quality Assurance.
PO4	Modern Tool Usage	Graduates will learn appropriate use of modern pharmacy-related computing tools.
PO5	Leadership Skills	Develop team spirit, apart from responding to the social needs and professional ethics.
PO6	Professional Identity	Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
PO7	Pharmaceutical Ethics	Honor personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles.
PO8	Communication	Develop written and oral communication skills in order to communicate effectively the outcomes of the Pharmaceutical problems.
PO9	The Pharmacist and society	Develop an understanding for the need of pharmaceutical sciences and technology towards giving quality life to people in society.
PO10	Environment & sustainability	Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO11	Life-long learning	Develop an aptitude for lifelong learning and continuous professional development



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COURSE OUTCOME (CO)

M. Pharmacy (Pharmaceutics)

First Year – SEM I	
Course Name: Modern Pharmaceutical Analytical Techniques Course Code: MPH101T	
CO-1	Understand the basic knowledge on assay of single and multiple component pharmaceuticals by using various analytical instruments.
CO-2	Develop the theoretical knowledge on various instrumental techniques available for analysis of organic substances by using analytical instruments.
CO-3	Improve skills in selecting the suitable techniques for analysis of drugs and pharmaceuticals.
CO-4	Interpret spectra of UV- visible, IR, NMR and Mass to identify the given compound.
CO-5	Describe the general methods for separation and purification of components from a mixture and their application to pharmaceutical industry.
CO-6	Apply the knowledge learnt in developing new procedures of their own design.
Course Name: Drug Delivery System Course Code: MPH102T	
CO-1	Explain the various approaches for development of novel drug delivery Systems.
CO-2	Enumerate the application of Dosage Forms for Personalized Medicine, Pharmacogenetics, Customized drug delivery systems, Bioelectronic Medicines, 3D printing of pharmaceuticals, and Telepharmacy.
CO-3	Identify the criteria for selection of drugs and polymers for the development of delivering system.
CO-4	Discuss the formulation and evaluation of Novel drug delivery systems
Course Name: Modern Pharmaceutics Course Code: MPH103T	
CO-1	Summarize the elements of preformulation studies, Pharmaceutical Dispersions, Formulation and evaluation parameters of SVP, LVP.
CO-2	Describe the Optimization techniques in pharmaceutical formulation, Statistical, Factorial designs and their applications in formulation.
CO-3	Explain the concepts of Pharmaceutical Validation, VMP, ICH & WHO guidelines, Government regulation, and facilities for URS, DQ, IQ, OQ & P.Q.
CO-4	Outline and learn Industrial Management and cGMP Considerations, Sales forecasting and TQM.
CO-5	Generalize the concept of Physics of tablet compression, compaction, and Study of consolidation parameters, including Similarity factors, significance, Standard deviation.
Course Name: Regulatory Affairs Course Code: MPH104T	
CO-1	Summarize documentation in Pharmaceutical Industry, The Concepts of innovator and generic drugs, drug development process, DMF, CFR
CO-2	Describe the Regulatory guidance's and guidelines for filing and approval process, ICH-Q,S,E,M. guidelines, Submission of global documents in CTD/ eCTD formats
CO-3	Describe about the Preparation of Dossiers and their submission to regulatory agencies in different Countries. Post approval regulatory requirements for actives and drug products
CO-4	Explain the requirements of Non clinical drug development process, IMPD, IB.
CO-5	Generalize the concepts of Clinical trials requirements for approvals for conducting clinical trials. Pharmacovigilance and process of monitoring in clinical trials.
Course Name: Pharmaceutics-I Course Code: MPH105P	



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CO-1	Estimate pharmacopoeial compounds and their formulations by UV Visible spectrophotometer, HPLC, Gas Chromatography, flame photometry, fluorimetry.
CO-2	Estimate In vitro dissolution of novel drug delivery systems like controlled release or sustained release marketed formulation.
CO-3	Formulate and evaluate novel drug delivery systems like sustained release matrix tablets, Mucoadhesive tablets and Transdermal patches.
CO-4	Discover the Preformulation studies of tablet dosage form.
CO-5	Determine the effect of process variables and excipients on tablet dosage form.

First Year – SEM II

Course Name: Molecular Pharmaceutics (Nano Technology & Targeted DDS)

Course Code: MPH201T

CO-1	Explain the various approaches for development of novel drug delivery Systems.
CO-2	Identify the criteria for selection of drugs for the development of delivering system.
CO-3	Identify the criteria for selection of Polymer for the development of delivering system.
CO-4	Discuss the formulation and evaluation of Novel drug delivery systems.

Course Name: Advanced Biopharmaceutics & Pharmacokinetics Course Code: MPH202T

CO-1	To recall the basic concepts of biopharmaceutics and pharmacokinetics.
CO-2	To understand the mechanism and apply the pharmacokinetic models for the determination of pharmacokinetic parameters.
CO-3	To design and evaluate dosage regimens of the drugs to analyze the drug product performance by in-vitro, in-vivo and in-situ models.
CO-4	To determine the bioavailability testing protocol of a drug and compare the bioequivalence among marketed products.
CO-5	To predict pharmacokinetic and pharmacodynamic drug interactions and potential clinical pharmacokinetic problems and application of basics of pharmacokinetic.

Course Name: Computer Aided Drug Development Course Code: MPH203T

CO-1	Summarize the History of Computers in Pharmaceutical Research and Development and compile the knowledge Quality by Design
CO-2	Elucidate the concept of Computational Modeling of Drug Disposition & BCRP, OCT, OATP, BBB-Choline Transporter
CO-3	Explain Computer-aided formulation development, Optimization Techniques in Pharmaceutical Formulation, Including Innovative Uses of Computers in R & D.
CO-4	Outline the details of Computer-aided biopharmaceutical characterization, Computer Simulations in Pharmacokinetics and Pharmacodynamics, and in Clinical Development.
CO-5	Generalize the concept of Artificial Intelligence, Robotics and Computational fluid dynamics.

Course Name: Cosmetics and cosmeceuticals Course Code: MPH204T

CO-1	Find, enumerate and classify the problems and key ingredients used in cosmetics and cosmeceuticals.
CO-2	Explain and summarize key building blocks for various formulations.
CO-3	Determine and organize the current technologies in the market.
CO-4	Choose and compile various key ingredients and basic science to develop cosmetics, cosmeceuticals and herbal formulations.
CO-5	Compare the scientific knowledge to develop cosmetics and cosmeceuticals with



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	desired Safety, sensory, stability, and efficacy.
Course Name: Pharmaceutics-II	
Course Code: MPH205P	
CO-1	Formulate and evaluate various Novel drug delivery system like Alginate beads, gelatin or albumin microsphere, Spherules, Liposomes or Niosomes.
CO-2	Compare the dissolution studies of marketed products and solubility studies
CO-3	Perform the computational modeling using various software and analyze the data accordingly.
CO-4	Estimate the In vitro In vivo studies related to ADME
CO-5	Develop and evaluate different dosage form.

M. Pharmacy (Pharmacology)

First Year – SEM I	
Course Name: Advanced Pharmacology I	
Course Code: MPL102T	
CO-1	Students are able to understand the basic knowledge of pharmacology.
CO-2	Describe Pharmacokinetic/Pharmacodynamics study.
CO-3	Understand Pathophysiology/Pharmacology of specific diseases, Physiological and Pathological role or various endogenous chemicals; Neurotransmitters, mechanism of action at cellular and molecular level, pharmacology and toxicology of existing as well as novel drugs associated with ANS.
CO-4	Understand pathophysiology/Pharmacology of specific diseases, Physiological and Pathological role or various endogenous chemicals; Neurotransmitters mechanism of action at cellular and molecular level, pharmacology and toxicology of existing as well as novel drugs associated with CNS.
CO-5	Identify contraindications and clinical applications of medications used to treat disorders.
Course Name: Pharmacological and Toxicological Screening Methods	
Course Code: MPL103T	
CO-1	Understand the regulations and ethical principles that regulate the use of animals in experiments.
CO-2	Able to understand various kind of lab animals used in drug discovery and research and best practices for maintaining and handling experimental animals in lab.
CO-3	Various innovative screening techniques used in drug discovery and research
CO-4	Knowing and connecting the preclinical outcomes to human beings,
CO-5	Demonstrate the preclinical outcomes to human beings.
Course Name: Cellular and Molecular Pharmacology	
Course Code: MPL104T	
CO-1	Understand the different cellular components, cellular processes and regulation of cellular molecular signaling pathways
CO-2	Learn about different secondary messengers in signal transduction process and their role in receptor ligand mediated signaling process
CO-3	Learn about the advancement in therapeutics with principles and applications of pharmacogenomic and proteomics, and related molecular techniques
CO-4	Understand basic principles of in-vitro cellular experimentation and applications of molecular biology techniques in pharmacology
Course Name: Pharmacology-I	
Course Code: MPL105P	
CO-1	Design & analyze the given sample of drug using spectroscopic, chromatographic, Fluorimetry,



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	and flame photometry.
CO-2	Administer drugs in animals, withdraw blood samples & assess the efficacy & safety of the given unknown compounds
CO-3	Perform experiments with rodents for CNS related activities, diuretic and GI effects
CO-4	Understand practical scientific concepts of cellular and molecular pharmacology, including in vitro cell culture techniques and cell-based assays
CO-5	Study genetic profiling and alteration using different cellular molecular techniques.

First Year – SEM II

Course Name: Advanced Pharmacology II		Course Code: MPL201T
CO-1	Describe how drugs work at the cellular and molecular level.	
CO-2	Describe the pathophysiology and medication used to treat specific disorders.	
CO-3	Recognise the negative effects, contraindications, and clinical applications of medications used to treat disorders.	
Course Name: Pharmacological and Toxicological Screening Methods II		
Course Code: MPL202T		
CO-1	Explain the various types of toxicity studies.	
CO-2	Appreciate the importance of ethical and regulatory requirements for toxicity studies.	
CO-3	Demonstrate the practical skills required to conduct the preclinical toxicity studies.	
Course Name: Principles of Drug Discovery		Course Code: MPL203T
CO-1	Understand the modern drug discovery process and various stages of it.	
CO-2	Appreciate the role of genomics, proteomics and bioinformatics in the drug discovery.	
CO-3	Describe various targets, biomarkers and in vitro screening techniques for drug discovery.	
CO-4	Apply computer aided drug design principles to study drug discovery process.	
Course Name: Clinical Research and Pharmacovigilance		Course Code: MPL204T
CO-1	Understand the requisites for constructing and conducting a clinical trial.	
CO-2	Describe different types of clinical trials and their designs.	
CO-3	Appreciate the role and responsibilities of key personnel in a clinical trial.	
CO-4	Understanding the principles of pharmacovigilance and safety monitoring system.	
CO-5	Understand the importance of pharmacoepidemiology and economical parameters.	
Course Name: Pharmacology-II		Course Code: MPL205P
CO-1	Perform experiments using various isolated tissue preparations, estimate activity of biological samples and interpret data.	
CO-2	Understand the OECD guidelines and perform toxicity studies, safety evaluation and pharmacokinetic profiling of a drug.	
CO-3	Understand the process of clinical trial and write clinical trial protocols.	
CO-4	Investigate and understand Cardiovascular responses to different drugs using different techniques.	
CO-5	Understand the computer aided drug discovery process and perform experiments using softwares.	