PROGRAM OUTCOMES (POs)

1. Pharmacy Knowledge
2. Planning Abilities
3. Problem analysis
4. Modern tool usage.
5. Leadership skills
6. Professional Identity
7. Pharmaceutical Ethics
8. Communication
9. The Pharmacist and society
10. Environment and sustainability
11. Life-long learning

Programme Specific outcomes (PSOs)

Program: Bachelor of Pharmacy

After completion of the program students are able:

PSO 1.

To impart theoretical & Practical knowledge among students in the various fields of pharmaceutical sciences viz., Pharmaceutics, Pharmaceutical Chemistry, Pharmacology, Pharmacognosy.

PSO 2.

To promote the development of communication skills, leadership qualities among the students.

PSO 3.

To upgrade practical skill of the students through industrial training and research to meet the challenges of the Pharmaceutical field.

PSO 4.

To make aware the students with fundamental regulatory aspects of Pharmaceuticals.

Programme Specific outcomes (PSOs)

Program: M. Pharm in Quality Assurance Techniques

After completion of the program students are able:

PSO1.

To Understand the applications of Quality assurance and Quality control throughout product life cycle.

PSO2.

To Analyze the Application Based Importance of Emerging Quality Building Concepts in Product Manufacturing.

PSO3.

To Perform Procedures like Method Validation, Process Validation, Equipment /Facilities/Utilities Validation, Documents and Records Designing as per the Regulatory Standards Leading to Compliance of cGMP.

PSO4.

To Understand the Regulatory requirements of Pharmaceuticals**.**

INSTITUTE OF PHARMACY

MET Bhujbal Knowledge City

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Programme Specific outcomes (PSOs)

Program: M. Pharm in Pharmaceutical Chemistry

After completion of the program students are able:

PSO 1.

To acquire advanced knowledge of Analytical Techniques, Pharmaceutical Chemistry, Medicinal Chemistry, Drug Design, Research Methodology and Drug Regulatory Affairs.

PSO 2.

To develop research aptitude to identify and provide valid conclusions for pharmaceutical problems by utilizing the technical skill gained through training and experimentation.

PSO 3.

To utilize the soft skills as a part of team in the professional endeavour

Programme Specific outcomes (PSOs)

Program: M. Pharm in Pharmaceutics

After completion of the program students are able:

PSO 1.

To acquire knowledge of novel as well as conventional drug delivery systems.

PSO 2.

To identify and resolve the research problems by utilizing the technical skill gained through training and experimentation.

PSO 3.

To utilize the soft skills as a part of team in the professional endeavour.

Program Specific Outcomes (PSOs)

Program: M. Pharm in Pharmacology

Upon completion of the course the student are able to:

1. Understand the basic concepts of Anatomy, Physiology, Pathophysiology and Clinical Biochemistry and Pharmacology including pharmacokinetics; pharmacodynamics; drug metabolism; and drug-drug interactions; and the interrelation of these pharmacological properties and pharmacological profile of a drug.
2. Understand the application of basic knowledge of Anatomy, Physiology and Pathophysiology, Pharmacothrepeutics, Clinical Pharmacology and Toxicology.
3. Understand the approaches for drug discovery and development and the regulatory procedures.
4. Know Current clinical judgement and Pharmacological details of major drugs in clinical practice.
5. Know etiological factors; pathogenesis, pathophysiological changes that occur in the most common disease states, their clinical presentations a and strategy of the therapy along with the choice of drug(s) can act to effectively treat, cure, or mitigate the underlying disease causes and/or symptoms along with the non-pharmacological approaches.
6. Understand the physiological, pharmacological, and psychological effects of acute and chronic exposure of individuals to drugs of abuse, and describe the consequences of sudden withdrawal of such a drug from a drug dependent individual.

Bhujbal Knowledge City MET's Institute of Pharmacy, Nashik

Course Outcomes

First Year B. Pharm 2019 Pattern (Sem I)

HUMAN ANATOMY AND PHYSIOLOGY-I :

Student should be able to

No.	Course Outcomes
1	Explain the gross morphology, structure and functions of various organs of the human body.
2	Describe the various homeostatic mechanisms and their imbalances.
3	Identify the various tissues and organs of different systems of human body and Appreciate coordinated working pattern of different organs of each system
4	Perform the various experiments related to special senses and nervous system
5	To verifiy physiological processes discussed in theory classes through experiments on living tissue, intact animals, models etc

PHARMACEUTICAL ANALYSIS :

Student should be able to

No.	Course Outcomes
1	The principles of volumetric and electrochemical analysis.
2	Carry out various volumetric titrations.
3	Carry out various electrochemical titrations.
4	Develop analytical skills.

PHARMACEUTICS- I:

Student should be able to

No.	Course Outcomes
1	Know the history of profession of Pharmacy
2	Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations
3	Understand the professional way of handling the prescription
4	Prepare various conventional dosage forms

PHARMACEUTICAL INORGANIC CHEMISTRY:

Student should be able to

No.	Course Outcomes
1	Know the sources of impurities and methods to determine the impurities in drugs and pharmaceuticals
2	Understand the medicinal and pharmaceutical importance of inorganic compounds
3	Perform Limit tests for chloride, sulfates and metals
4	Perform Identification tests for Inorganic salts
5	Prepare few inorganic pharmaceuticals

COMMUNICATION SKILLS :

Student should be able to

No.	Course Outcomes
1	Understand the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation
2	Communicate effectively (Verbal and Non Verbal)
3	Effectively manage the team as a team player
4	Develop interview skills and Leadership qualities
5	Develop skills regarding Basic communication Pronunciations Advanced Learning like writing and presentations

REMEDIAL BIOLOGY:

Student should be able to

No.	Course Outcomes
1	Know the classification and salient features of five kingdoms of life
2	Understand the basic components of anatomy & physiology of plant
3	Understand the basic components of anatomy & physiology animal with special reference to human
4	Perform mounting and staining, permanent slide preparation
5	Determine blood group, blood pressure, tidal volume

REMEDIAL MATHEMATICS:

Student should be able to

No.	Course Outcomes
1	Know the Partial fraction, Logarithm, matrices and Determinant, Analytical geometry and their application in Pharmacy
2	Know Calculus, differential equation and Laplace transform and their application in Pharmacy
3	Solve the different types of problems by applying theory
4	Appreciate the important application of mathematics in Pharmacy

First Year B. Pharm 2019 Pattern (Sem II)

HUMAN ANATOMY AND PHYSIOLOGY-II :

Student should be able to

No.	Course Outcomes
1	Explain the gross morphology, structure and functions of various organs of the human body
2	Describe the various homeostatic mechanisms and their imbalances
3	Identify the various tissues and organs of different systems of human body
4	Perform the hematological tests like blood cell counts, haemoglobin estimation, bleeding/clotting time etc. and also record blood pressure, heart rate, pulse and respiratory volume
5	Demonstrate nervous system endocrine system using specimen, models
6	Demonstrate the function of olfactory nerve, visual acuity, reflex activity

PHARMACEUTICAL ORGANIC CHEMISTRY – I

Student should be able to

No.	Course Outcomes
1	Write the structure, name and the type of isomerism of the organic compound
2	Write the reaction, name the reaction and orientation of reactions
3	Account for reactivity/stability of compounds
4	Identify/confirm the identification of organic compounds

BIOCHEMISTRY:

Student should be able to

No.	Course Outcomes
1	Understand the catalytic role of enzymes and importance of enzyme in biochemical process.
2	Understand the metabolism of nutrient molecules in physiological and pathological conditions
3	Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins
4	Perform Qualitative analysis of carbohydrates, Urine
5	Perform identification tests for protein, amino acids
6	Determine blood sugar, creatinine , cholesterol

PATHOPHYSIOLOGY:

Student should be able to

No.	Course Outcomes
1	Understand Basic principles of Cell injury and Adaptation
2	Explain Basic mechanism involved in the process of inflammation andrepair
3	Describe the etiology and pathogenesis of the selected disease states
4	Name the signs and symptoms of the diseases

COMPUTER APPLICATIONS IN PHARMACY:

Student should be able to

No.	Course Outcomes
1	Know the various types of application of computers in pharmacy
2	Know the various types of databases
3	Know the various applications of databases in pharmacy
4	Design a questionnaire using a word processing package
5	Create a HTML web page

ENVIRONMENTAL SCIENCES:

Student should be able to

No.	Course Outcomes
1	Create the awareness about environmental problems among learners
2	Impart basic knowledge about the environment and its allied problems
3	Develop an attitude of concern for the environment
4	Motivate learner to participate in environment protection and environment improvement
5	Acquire skills to help the concerned individuals in identifying and solving environmental problems
6	Strive to attain harmony with Nature

Course Outcomes

Second Year B. Pharm 2019 Pattern (Sem III)

PHARMACEUTICAL ORGANIC CHEMISTRY –II

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Write the structure, name and the type of isomerism of the organic compound
2	Write the reaction, name the reaction and orientation of reactions
3	Account for reactivity/stability of compounds
4	Prepare small organic compounds

PHYSICAL PHARMACEUTIS –I

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Investigate and apply various theories, laws and equations related to different states of matter
2	Distinguish the principles of complexation/ protein binding & to use them for calculations of drug release and stability constant
3	Demonstrate use of physicochemical properties of drugs in the formulation development and evaluation of dosage forms

PHARMACEUTICAL MICROBIOLOGY

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Understand methods of identification, cultivation and preservation of various Microorganisms
2	To understand the importance and implementation of sterlization in pharmaceutical processing and industry
3	Learn sterility testing of pharmaceutical products
4	Carry out microbiological standardization of Pharmaceuticals
5	Understand the cell culture technology and its applications in pharmaceutical industries

PHARMACEUTICAL ENGINEERING

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Know various unit operations used in Pharmaceutical industries.
2	Understand the material handling techniques
3	Perform various processes involved in pharmaceutical manufacturing process
4	Carry out various test to prevent environmental pollution
5	Appreciate and comprehend significance of plant lay out design for optimum use of resources
6	Appreciate the various preventive methods used for corrosion control in Pharmaceutical industries.

Second Year B. Pharm 2019 Pattern (Sem IV)

PHARMACEUTICAL ORGANIC CHEMISTRY III

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Understand the methods of preparation and properties of organic compounds
2	Explain the stereochemical aspects of organic compounds and stereo chemical reactions
3	Know the medicinal uses and other applications of organic compounds

MEDICINAL CHEMISTRY I

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Understand the chemistry of drugs with respect to their pharmacological activity
2	Understand the drug metabolic pathways, adverse effect and therapeutic value of Drugs
3	Know the Structural Activity Relationship (SAR) of different class of drugs
4	Write the chemical synthesis of some drugs

PHYSICAL PHARMACEUTICS-II

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Relate various physicochemical properties of drug and excipient molecules in designing the dosage forms
2	Distinguish the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
3	Demonstrate the behavior and mechanism of drugs and excipients in the formulation development and evaluation of dosage forms.

PHARMACOLOGY-I

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Understand the pharmacological actions of different categories of drugs
2	Explain the mechanism of action at organ system/sub cellular/macromolecular levels
3	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases
4	Observe the effects of drugs on animal by simulated experiments
5	Appreciate correlation of pharmacology with other bio medical sciences

PHARMACOGNOSY AND PHYTOCHEMISTRY I

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Know the techniques in the cultivation and production of crude drugs
2	Know the crude drugs, their uses and chemical nature
3	Know the evaluation techniques for the herbal drugs
4	Carry out the microscopic and morphological evaluation of crude drugs

Third Year B. Pharm 2018 Pattern (Sem V)

MEDICINAL CHEMISTRY – II

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Understand the chemistry of drugs with respect to their pharmacological activity
2	Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
3	Know the Structural Activity Relationship of different class of drugs
4	Study the chemical synthesis of selected drugs

INDUSTRIAL PHARMACY I

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Illustrate various pharmaceutical dosage forms and their manufacturing techniques.
2	Describe various factors to be considered in development of pharmaceutical dosage forms
3	Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality

PHARMACOLOGY-II

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Understand the mechanism of drug action and its relevance in the treatment of different diseases
2	Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments
3	Demonstrate the various receptor actions using isolated tissue preparation
4	Appreciate correlation of pharmacology with related medical sciences

PHARMACOGNOSY AND PHYTOCHEMISTRY-II

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Know the modern extraction techniques, characterization and identification of the herbal drugs and Phytoconstituents
2	Understand the production of Phytoconstituents /herbal formulation
3	Understand the metabolic pathways in formation of secondary metabolites and application of biogenetic studies
4	Carry out isolation and identification of Phytoconstituents

PHARMACEUTICAL JURISPRUDENCE

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Understand the Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals.
2	Understand various Indian pharmaceutical Acts and Laws
3	Understand the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals.
4	Understand the code of ethics during the pharmaceutical practice

Third Year B. Pharm 2018 Pattern (Sem VI)

MEDICINAL CHEMISTRY – III

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Understand the importance of drug design and different techniques of drug design.
2	Understand the chemistry of drugs with respect to their biological activity
3	Know the metabolism, adverse effects and therapeutic value of drugs.
4	Know the importance of SAR of drugs.

PHARMACOLOGY-III

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases
2	Comprehend the principles of toxicology and treatment of various poisonings
3	Appreciate correlation of pharmacology with related medical sciences

HERBAL DRUG TECHNOLOGY

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Understand raw material as source of herbal drugs from cultivation to herbal drug product
2	Know the WHO and ICH guidelines for evaluation of herbal drugs
3	Know the herbal cosmetics, natural sweeteners, nutraceuticals
4	Appreciate patenting of herbal drugs, GMP

BIOPHARMACEUTICS AND PHARMACOKINETICS

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Understand the basic concepts in biopharmaceutics and pharmacokinetics and their significance
2	Use plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination
3	Understand the concepts of bioavailability and bioequivalence of drug products and their significance.
4	Understand the concept of dissolution and application of in vitro in vivo correlation in drug product development

PHARMACEUTICAL BIOTECHNOLOGY

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Understanding the importance of Immobilized enzymes in Pharmaceutical Industries
2	Genetic engineering applications in relation to production of pharmaceuticals
3	Importance of Monoclonal antibodies in Industries
4	Appreciate the use of microorganisms in fermentation technology

PHARMACEUTICAL QUALITY ASSURANCE

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Understand the cGMP aspects in a pharmaceutical industry
2	Appreciate the importance of documentation
3	Understand the scope of quality certifications applicable to pharmaceutical industries
4	Understand the responsibilities of QA & QC departments

First Year Pharm D 2019 Pattern

HUMAN ANATOMY & PHYSIOLOGY

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Describe the structure (gross and histology) and functions of various organs of the human body
2	Describe the various homeostatic mechanisms and their imbalances of various systems
3	Identify the various tissues and organs of the different systems of the human body
4	Perform the hematological tests and also record blood pressure, heart rate, pulse and Respiratory volumes
5	Appreciate coordinated working pattern of different organs of each system
6	Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body

PHARMACEUTICS

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Know the formulation aspects of different dosage forms
2	Do different pharmaceutical calculation involved in formulation
3	Formulate different types of dosage forms
4	Appreciate the importance of good formulation for effectiveness

MEDICINAL BIOCHEMISTRY

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Understand the catalytic activity of enzymes and importance of isoenzymes in diagnosis of diseases
2	Know the metabolic process of biomolecules in health and illness (metabolic disorders)
3	Understand the genetic organization of mammalian genome; protein synthesis; replication; mutation and repair mechanism
4	Know the biochemical principles of organ function tests of kidney, liver and endocrine gland
5	Do the qualitative analysis and determination of biomolecules in the body fluids

PHARMACEUTICAL ORGANIC CHEMISTRY

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Know about IUPAC/Common system of nomenclature of simple organic compounds belonging to different classes of organic compounds
2	Know Some important physical properties of organic compounds
3	Understand Free radical/ nucleophyllic [alkyl/ acyl/ aryl] /electrophyllic substitution, free radical/ nucleophyllic / electrophyllic addition, elimination, oxidation and reduction reactions with mechanism, orientation of the reaction, order of reactivity, stability of compounds
4	Know Some named organic reactions with mechanisms
5	Explain Methods of preparation, test for purity, principle involved in the assay, important medicinal uses of some important organic compound

PHARMACEUTICAL INORGANIC CHEMISTRY

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Understand the principles and procedures of analysis of drugs and also regarding the application of inorganic pharmaceuticals
2	Know the analysis of the inorganic pharmaceuticals their applications
3	Appreciate the importance of inorganic pharmaceuticals in preventing and curing the disease

REMEDIAL MATHEMATICS

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Know Trignometry, Analytical geometry, Matrices, Determinant, Integration, Differential equation, Laplace transform and their applications
2	Solve the problems of different types by applying theory
3	Appreciate the important applications of mathematics in pharmacy.

REMEDIAL BIOLOGY

Upon completion of the course Student should be able to

No.	Course Outcomes
1	Know natural sources such as plant and animal origin.
2	Know various naturally occurring drugs and its history, sources, classification, distribution and the characters of the plants and animals.

Bhujbal Knowledge City MET's Institute of Pharmacy, Nashik

Course Outcomes

First Year M. Pharm 2019 Pattern (Sem I)

MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES:

Student should be able to

No.	Course Outcomes
1	Understand Analytical techniques for identification, characterization and quantification of drugs
2	Know Theoretical and practical skills of UV, IR, NMR instruments handling and use
3	Know Theoretical and practical skills of Mass spectrometer, HPLC, GC instruments handling and use
4	Perform Structural Elucidation of organic compounds using spectroscopic tools

DRUG DELIVERY SYSTEM:

Student should be able to

No.	Course Outcomes
1	Know The various approaches for development of novel drug delivery systems.
2	Understand The criteria for selection of drugs and polymers for the development of delivering system
3	Explain formulation of Novel drug delivery systems
4	Explain evaluation of Novel drug delivery systems

MODERN PHARMACEUTICS:

Student should be able to

No.	Course Outcomes
1	Know The elements of preformulation studies.
2	Know Industrial Management and GMP Considerations.
3	Explain Optimization Techniques & Pilot Plant Scale Up Techniques
4	Understand Stability Testing, sterilization process & packaging of dosage forms
5	Understand The Active Pharmaceutical Ingredients and Generic drug Product development

REGULATORY AFFAIRS:

Student should be able to

No.	Course Outcomes
1	Understand The Concepts of innovator and generic drugs, drug development process, The Regulatory guidance's and guidelines for filing and approval process
2	Know Post approval regulatory requirements for actives and drug products
3	Know Submission of global documents in CTD/ eCTD formats
4	Explain Clinical trials requirements for approvals for conducting clinical trials
5	Know Pharmacovigilence and process of monitoring in clinical trials.
6	Understand Preparation of Dossiers and their submission to regulatory agencies in different countries

PHARMACEUTICS PRACTICALS – I

Student should be able to

No.	Course Outcomes
1	Perform Analysis of pharmacopoeial compounds and their formulations by UV Vis spectrophotometer
2	Perform Experiments based on HPLC, fluorimetry, flame photometry
3	Formulate and evaluate sustained release matrix tablets, osmotically controlled DDS, Floating DDS– hydro dynamically balanced DDS
4	Formulate and evaluate Muco adhesive tablets., Trans dermal patches
5	Study Micromeritic properties of powders and granulation, effect of particle size on dissolution of a tablet

ADVANCED ORGANIC CHEMISTRY - I:

Student should be able to

No.	Course Outcomes
1	Understand the principles and applications of reterosynthesis
2	Know the mechanism & applications of various named reactions
3	Know The concept of disconnection to develop synthetic routes for small target molecule.
4	Know The various catalysts used in organic reactions
5	Understand the chemistry of heterocyclic compounds

ADVANCED MEDICINAL CHEMISTRY:

Student should be able to

No.	Course Outcomes
1	Understand Different stages of drug discovery
2	Know Role of medicinal chemistry in drug research
3	Understand Different techniques for drug discovery
4	Know Various strategies to design and develop new drug like molecules for biological targets
5	Understand Peptidomimetics

CHEMISTRY OF NATURAL PRODUCTS

Student should be able to

No.	Course Outcomes
1	Understand Different types of natural compounds and their chemistry and medicinal importance
2	Understand The concept of rDNA technology tool for new drug discovery
3	Understand General methods of structural elucidation of compounds of natural origin
4	Understand Isolation, Purification and characterization of simple chemical constituents from natural source
5	Understand The importance of natural compounds as lead molecules for new drug discovery

PHARMACEUTICAL CHEMISTRY PRACTICAL – I

Student should be able to

No.	Course Outcomes
1	Perform Analysis of pharmacopoeial compounds and their formulations by UV Vis spectrophotometer
2	Perform Experiments based on HPLC, fluorimetry, flame photometry
3	Perform Simultaneous estimation of multi component containing formulations by UV spectrophotometry
4	Perform the reactions of synthetic importance like Claisen–Schimidt reaction., Benzyllic acid rearrangement, Beckmann rearrangement
5	Perform the reactions of synthetic importance like Hoffmann rearrangement , Mannich reaction
6	Do purification and Characterization of synthesized compounds using TLC, melting point and IR spectroscopy

QUALITY MANAGEMENT SYSTEMS:

Student should be able to

No.	Course Outcomes
1	Understand The importance of quality
2	Understand Tools for quality improvement
3	Understand Analysis of issues in quality
4	Understand Quality evaluation of pharmaceuticals
5	Understand Stability testing of drug and drug substances
6	Understand Statistical approaches for quality

QUALITY CONTROL AND QUALITY ASSURANCE

Student should be able to

No.	Course Outcomes
1	Understand the cGMP aspects in a pharmaceutical industry
2	Appreciate the importance of documentation
3	Understand the scope of quality certifications applicable to Pharmaceutical industries
4	Understand the responsibilities of QA & QC departments

PRODUCT DEVELOPMENT AND TECHNOLOGY TRANSFER

Student should be able to

No.	Course Outcomes
1	To understand the new product development process
2	To understand the necessary information to transfer technology from R&D to actual manufacturing by sorting out various information obtained during R&D
3	To elucidate necessary information to transfer technology of existing products between various manufacturing places

QUALITY ASSURANCE PRACTICAL - I

Student should be able to

No.	Course Outcomes
1	Perform Analysis of pharmacopoeial compounds and their formulations by UV Vis spectrophotometer
2	Perform Experiments based on HPLC, fluorimetry, flame photometry
3	Perform Simultaneous estimation of multi component containing formulations by UV spectrophotometry
4	Perform Case studies on – Total Quality Management, Six Sigma, Change Management/ Change control. Deviations , Out of Specifications , Out of Trend
5	Do Assay of raw materials as per official monographs
6	Do Quality control tests for Primary and secondary packaging materials

ADVANCED PHARMACOLOGY – I

Student should be able to

No.	Course Outcomes
1	Discuss the pathophysiology and pharmacotherapy of certain diseases
2	Explain the mechanism of drug actions at cellular and molecular level
3	Understand the adverse effects, contraindications of drugs used in treatment of diseases
4	Understand clinical uses of drugs used in treatment of diseases

PHARMACOLOGICAL AND TOXICOLOGICAL SCREENING METHODS - I

Student should be able to

No.	Course Outcomes
1	Appraise the regulations and ethical requirement for the usage of experimental animals.
2	Describe the various animals used in the drug discovery process and good laboratory practices in maintenance and handling of experimental animals
3	Describe the various newer screening methods involved in the drug discovery process
4	Appreciate and correlate the preclinical data to humans

CELLULAR ANDMOLECULAR PHARMACOLOGY

Student should be able to

No.	Course Outcomes
1	Explain the receptor signal transduction processes.
2	Explain the molecular pathways affected by drugs.
3	Appreciate the applicability of molecular pharmacology and biomarkers in drug discovery process
4	Demonstrate molecular biology techniques as applicable for pharmacology

PHARMACOLOGICAL PRACTICAL-I

Student should be able to

No.	Course Outcomes
1	Perform Analysis of pharmacopoeial compounds & their formulations by UV Vis spectrophotometer
2	Do Experiments based on HPLC, Fluorimetry, flame photometry
3	Perform Techniques of blood sampling, anesthesia and euthanasia of experimental animals.
4	Evaluate analgesic, anti–inflammatory, local anesthetic, mydriatic and miotic activity
5	Evaluate of antiulcer activity by pylorus ligation method and perform Oral glucose tolerance test

Bhujbal Knowledge City MET's Institute of Pharmacy, Nashik

First Year M. Pharm 2019 Pattern (Sem II)

MOLECULAR PHARMACEUTICS:

Student should be able to

No.	Course Outcomes
1	Know The various approaches for development of novel drug delivery systems
2	Know criteria for selection of drugs and polymers for the development of NTDS
3	Understand The formulation and evaluation of novel drug delivery systems

ADVANCED BIOPHARMACEUTICS & PHARMACOKINETICS:

Student should be able to

No.	Course Outcomes
1	Understand The basic concepts in biopharmaceutics and pharmacokinetics
2	Understand The use raw data and derive the pharmacokinetic models and parameters the best describe the process of drug absorption, distribution, metabolism and elimination
3	Know The critical evaluation of biopharmaceutic studies involving drug product equivalency
4	Understand The design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters
5	Understand The potential clinical pharmacokinetic problems and application of basics of pharmacokinetic

COMPUTER AIDED DRUG DEVELOPMENT:

Student should be able to

No.	Course Outcomes
1	Know History of Computers in Pharmaceutical Research and Development
2	Understand Computational Modeling of Drug Disposition
3	Understand Computers in Preclinical Development
4	Understand Optimization Techniques in Pharmaceutical Formulation
5	Know Computers in Market Analysis/Clinical Development
6	Understand Computational fluid dynamics(CFD) and Artificial Intelligence (AI) and Robotics

COSMETICS AND COSMECEUTICALS:

Student should be able to

No.	Course Outcomes
1	Know Key ingredients used in cosmetics and cosmeceuticals
2	Know Key building blocks for various formulations
3	Understand Current technologies in the market
4	Know Various key ingredients and basic science to develop cosmetics and cosmeceuticals
5	Know Scientific knowledge to develop cosmetics and cosmeceuticals with desired Safety, stability, and efficacy

PHARMACEUTICS PRACTICALS – II:

Student should be able to

No.	Course Outcomes
1	Study the effect of temperature change, non solvent addition, incompatible polymer addition in microcapsules preparation
2	Formulate and evaluate gelatin /albumin microspheres/ liposomes/niosomes/ spherules/microparticles
3	Explain Case studies of Bioavailability studies of Paracetamol in animals/ Pharmacokinetic and IVIVC data analysis/ In vitro cell studies for permeability and metabolism
4	Understand Quality-by-Design in Pharmaceutical Development

ADVANCED SPECTRAL ANALYSIS

Student should be able to

No.	Course Outcomes
1	Interpret of the NMR, Mass and IR spectra of various organic compounds
2	Understand Theoretical and practical skills of the hyphenated instruments
3	Identify organic compounds

ADVANCED ORGANIC CHEMISTRY - II

Student should be able to

No.	Course Outcomes
1	Know the principles and applications of Green chemistry
2	Understand various catalysts used in organic reactions
3	Understand the concept of stereochemistry and asymmetric synthesis.
4	Know the concept of peptide chemistry.

COMPUTER AIDED DRUG DESIGN

Student should be able to

No.	Course Outcomes
1	Understand Role of CADD in drug discovery
2	Understand Different CADD techniques and their applications
3	Understand Various strategies to design and develop new drug like molecules
4	Understand Working with molecular modeling softwares to design new drug molecules
5	Understand the in silico virtual screening protocols

PHARMACEUTICAL PROCESS CHEMISTRY:

Student should be able to

No.	Course Outcomes
1	Know The strategies of scale up process of APIs and intermediates
2	Understand various unit operations in process chemistry
3	Understand various reactions in process chemistry

PHARMACEUTICAL CHEMISTRY PRACTICALS – II

Student should be able to

No.	Course Outcomes
1	Perform Synthesis of organic compounds by adapting different approaches involving Oxidation /Reduction/hydrogenation /Nitration
2	Do Assignments on regulatory requirements in API
3	Interpret of organic compounds by FT–IR/ NMR/ MS
4	Carry out the preparation of organic compounds like 4–chlorobenzhydrylpiperazine, 4–iodotolene, vanillyl alcohol, umbelliferone

HAZARDS AND SAFETY MANAGEMENT

Student should be able to

No.	Course Outcomes
1	Know basic knowledge about the environment and its allied problems
2	Develop an attitude of concern for the industry environment
3	Ensure safety standards in pharmaceutical industry
4	Provide comprehensive knowledge on the safety management
5	Empower an ideas to clear mechanism and management in different kinds of hazard management system
6	Understand the method of Hazard assessment, procedure, methodology for provide safe industrial atmosphere.

PHARMACEUTICAL VALIDATION:

Student should be able to

No.	Course Outcomes
1	Understand the concepts of calibration, qualification and validation
2	Understand the qualification of various equipments and instruments
3	Understand Process validation of different dosage forms
4	Understand Validation of analytical method for estimation of drugs Cleaning validation of equipments employed in the manufacture of pharmaceuticals

AUDITS AND REGULATORY COMPLIANCE

Student should be able to

No.	Course Outcomes
1	To understand the importance of auditing
2	To understand the methodology of auditing
3	To carry out the audit process
4	To prepare the auditing report
5	To prepare the check list for auditing

PHARMACEUTICAL MANUFACTURING TECHNOLOGY:

Student should be able to

No.	Course Outcomes
1	Know the common practice in the pharmaceutical industry developments, plant layout and production planning
2	Be familiar with the principles and practices of aseptic process technology, non sterile manufacturing technology and packaging technology
3	Have a better understanding of principles and implementation of Quality by design (QbD) and process analytical technology (PAT) in pharmaceutical manufacturing

QUALITY ASSURANCE PRACTICAL – II PRACTICALS

Student should be able to

No.	Course Outcomes
1	Understand Validation of an analytical method for a drug
2	Understand Process validation of any non-sterile or sterile dosage form
3	Know Cleaning validation of one equipment
4	Prepare Check list for Bulk Pharmaceutical Chemicals vendors/ tableting production/ sterile production area/ Water for injection
5	Understand Design of plant layout: Sterile and non-sterile

ADVANCED PHARMACOLOGY-II:

Student should be able to

No.	Course Outcomes
1	Explain the mechanism of drug actions at cellular and molecular level.
2	Discuss the pathophysiology and pharmacotherapy of certain diseases.
3	Understand the adverse effects, contraindications of drugs used in the treatment of diseases
4	Understand the clinical uses of drugs used in the treatment of diseases

PHARMACOLOGICAL AND TOXICOLOGICAL SCREENING METHODS-II

Student should be able to

No.	Course Outcomes
1	Explain the various types of toxicity studies.
2	Appreciate the importance of ethical and regulatory requirements for toxicity studies
3	Demonstrate the practical skills require conducting the preclinical toxicity studies

PRINCIPLES OF DRUG DISCOVERY

Student should be able to

No.	Course Outcomes
1	Explain the various stages of drug discovery.
2	Explain various lead seeking method and lead optimization.
3	Appreciate the importance of the role of computer aided drug design in drug discovery
4	Explain various targets, biomarkers and in vitro screening techniques for drug discovery
5	Appreciate the importance of the role of genomics, proteomics and bioinformatics in drug discovery

CLINICAL RESEARCH AND PHARMACOVIGILANCE:

Student should be able to

No.	Course Outcomes
1	Explain the regulatory requirements for conducting clinical trial and Demonstrate the types of clinical trial designs.
2	Execute safety monitoring, reporting and close-out activities
3	Explain the principles of Pharmacovigilance.
4	Detect new adverse drug reaction and their assessment.
5	Perform the adverse drug reaction reporting systems and communication in Pharmacovigilance
6	Explain the responsibilities of key players involved in clinical trials.

PHARMACOLOGICAL PRACTICAL – II

Student should be able to

No.	Course Outcomes
1	To record the DRC of agonist using suitable isolated tissues preparation
2	To determine to the strength of unknown sample by matching bioassay/ interpolation / bracketing bioassay/ multiple point by using suitable tissue preparation
3	Estimate PA2 values of various antagonists using suitable isolated tissue preparations
4	Perform Drug absorption studies by averted rat ileum preparation
5	Perform Acute oral toxicity studies as per OECD guidelines