



PROGRAM OUTCOMES FOR M. PHARMACY PROGRAM

PO.1.1 Postgraduates will acquire adequate scientific information regarding basic principles of Pharmaceutical and Medicinal chemistry, Pharmaceutics including Cosmetology, Pharmacology and Pharmacognosy. They will also have hands on training of practical aspects of Synthesis of APIs and its intermediates along with Formulation and Development, Analysis and Quality assurance of various pharmaceutical dosage forms including those of herbal origin as per standards of official books, WHO, and other regulatory agencies.


PO.1.2 Postgraduates will develop an ability to plan, visualize and work on multidisciplinary tasks. They will be able to demonstrate necessary skills (eg. working independently, time management and organizational skills). They will demonstrate an adaptable, flexible and effective approach towards organizational development.

PO.1.3 Postgraduates will be able to think logically and solve the problems, will develop an ability to conduct, analyze and interpret data of pharmaceutical experiments in various departments (Eg: Drug discovery, Formulation & Development, Production, Quality control & Quality assurance etc) as per the needs of pharmaceutical industries.

PO.1.4 Postgraduates will master the key concepts in the discipline of their interest in pharmaceutical sciences. They will demonstrate these skills to use modern pharmaceutical tools, software, and equipments to analyze & solve problems.

PO.1.5 Postgraduates will develop leadership and interpersonal skills such as influencing others, negotiating and working with others, conflict management and leading others through the problem-solving process. They will be able to lead and function both individually and as a member of a team.

PO.1.6 Postgraduates will apply theoretical and practical skills developed through classroom, laboratories and team project experiences and thus will develop confidence and will be able to i) do specialized research in the core and applied areas of pharmaceutical sciences. ii) manufacture, analyse and assure the drug based formulations. iii) promote and market the pharmaceuticals and iv) train the budding pharmacist to become self-reliant pharmacist and a health care professional.


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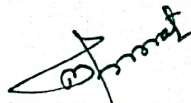
PO.1.7 Postgraduates will demonstrate knowledge of professional and ethical responsibilities as per pharmaceutical jurisprudence. The graduates will swear by a code of ethics of Pharmacy Council of India in relation to community and shall act as integral part of a health care system. They will demonstrate honesty, integrity, ethical understanding, and respect for others and will carry out their professional responsibilities by adhering to high ethical standards.

PO.1.8 Postgraduates will acquire excellent interpersonal oral communication and writing skills. They will be able to demonstrate knowledge and proficiency with current audio-visual presentation technologies and develop an ability to communicate scientific knowledge in non-expert/lay term by adopting various modes of scientific communications (e.g., abstract, manuscripts, project reports, oral and poster presentations etc). This will allow effective exchange of professional information.

PO.1.9 Postgraduates will demonstrate the impact of pharmacy knowledge on the society and also will be aware of modern issues. They will create awareness of healthcare issues through interactions with others and will gain a sense of self-respect towards community and citizenship.

PO.1.10 Postgraduates will be able to demonstrate a high-level of understanding of the key stages in drug discovery, development, and commercialization. This will lead to the manufacturing of drugs and pharmaceuticals considering its impact on the environment and surrounding.

PO.1.11 Postgraduates will be able to demonstrate knowledge and skills in all disciplines of Pharmaceutical sciences and develop a sound pharmaceutical care plan to manage medication-related problems. They will retrieve, evaluate, and apply current drug information in the delivery of pharmaceutical care and assure safe and accurate preparation and dispensing of medications.


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M. PHARMACY (PHARMACEUTICS)

SEMESTER I

MPH 101 T. MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES (Common for All PG Pharmacy Courses)

Objectives : After completion of course, student is able to know,

- Chemicals and Excipients
- The analysis of various drugs in single and combination dosage forms
- Theoretical and practical skills of the instruments

MPH 102T. DRUG DELIVERY SYSTEMS

OBJECTIVES: Upon completion of the course, student shall be able to understand

- The various approaches for development of novel drug delivery systems.
- The criteria for selection of drugs and polymers for the development of delivering system
- The formulation and evaluation of Novel drug delivery systems.

MPH 103T. MODERN PHARMACEUTICS

OBJECTIVES: Upon completion of the course, student shall be able to understand

- The elements of preformulation studies.
- The Active Pharmaceutical Ingredients and Generic drug Product development
- Industrial Management and GMP Considerations.
- Optimization Techniques & Pilot Plant Scale Up Techniques
- Stability Testing, sterilization process & packaging of dosage forms.

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MPH 104T. REGULATORY AFFAIRS

OBJECTIVES: Upon completion of the course, student shall be able to understand

- The Concepts of innovator and generic drugs, drug development process
- The Regulatory guidance's and guidelines for filing and approval process
- Preparation of Dossiers and their submission to regulatory agencies in different countries
- Post approval regulatory requirements for actives and drug products
- Submission of global documents in CTD/ eCTD formats
- Clinical trials requirements for approvals for conducting clinical trials
- Pharmacovigilance and process of monitoring in clinical trials.

MPH105P. PHARMACEUTICS PRACTICAL I

OBJECTIVES: Upon completion of the course, student shall be able to understand

- The students shall be able to understand analysis of pharmacopoeial compounds and their formulations by UV Vis spectrophotometer
- The students shall be able to carry out preformulation studies of tablets
- The students shall be able to understand experiments based on HPLC


Semester II

MPH 201T. MOLECULAR PHARMACEUTICS (NANO TECHNOLOGY & TARGETED DDS) (NTDS)

OBJECTIVES: Upon completion of the course, student shall be able to understand

- The various approaches for development of novel drug delivery systems.
- The criteria for selection of drugs and polymers for the development of NTDS
- The formulation and evaluation of novel drug delivery systems.

MPH 202T. ADVANCED BIOPHARMACEUTICS & PHARMACOKINETICS


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OBJECTIVES: Upon completion of the course, student shall be able to understand

- The basic concepts in biopharmaceutics and pharmacokinetics.
- The use raw data and derive the pharmacokinetic models and parameters the best describe the process of drug absorption, distribution, metabolism and elimination.
- The critical evaluation of biopharmaceutic studies involving drug product equivalency.
- The design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.
- The potential clinical pharmacokinetic problems and application of basics of pharmacokinetic

MPH 203T. COMPUTER AIDED DRUG DEVELOPMENT


OBJECTIVES: Upon completion of the course, student shall be able to understand

- History of Computers in Pharmaceutical Research and Development
- Computational Modeling of Drug Disposition
- Computers in Preclinical Development
- Optimization Techniques in Pharmaceutical Formulation
- Computers in Market Analysis
- Computers in Clinical Development
- Artificial Intelligence (AI) and Robotics
- Computational fluid dynamics(CFD)

MPH 204T. COSMETICS AND COSMECEUTICALS

OBJECTIVES: Upon completion of the course, student shall be able to understand

- Key ingredients used in cosmetics and cosmeceuticals.
- Key building blocks for various formulations.
- Current technologies in the market
- Various key ingredients and basic science to develop cosmetics and cosmeceuticals


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→ Scientific knowledge to develop cosmetics and cosmeceuticals with desired Safety, stability, and efficacy.

MPH205P. PHARMACEUTICS PRACTICAL-II

OBJECTIVES: Upon completion of the course, student shall be able to understand

- The students shall be able to understand the effect of temperature change, non solvent addition, incompatible polymer addition in microcapsules preparation
- The students shall be able to understand Quality-by-Design in Pharmaceutical Development
- The students shall be able to understand DoE Using Design Expert® Software

PHARMACEUTICAL ANALYSIS & QUALITY ASSURANCE (PA&QA)

Semester I

MPAQA 102T. ADVANCED PHARMACEUTICAL ANALYSIS AND QUALITY MANAGEMENT

Objectives: At the completion of this subject, it is expected that the student shall be able to know

- Modern Analysis method protocols
- Basic principles of Immunoassays
- The TQM aspects in a pharmaceutical industry
- To understand the scope IPQC applicable to pharmaceutical industries

MPAQA 103T. QUALITY CONTROL AND QUALITY ASSURANCE

Objectives: At the completion of this subject, it is expected that the student shall be able to know

- The cGMP aspects in a pharmaceutical industry
- To appreciate the importance of documentation
- To understand the scope of quality certifications applicable to pharmaceutical industries
- To understand the responsibilities of QA & QC departments

MPAQA 104T. HERBAL AND COSMETIC ANALYSIS

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Objectives: At completion of this course student shall be able to understand

- Determination of herbal remedies and regulations
- Analysis of natural products and monographs
- Determination of Herbal drug-drug interaction
- Principles of performance evaluation of cosmetic products.

MPAQA 105 P PHARMACEUTICAL PAQA PRACTICAL I

Objectives: At completion of this course student shall be able

- To perform analysis of drugs/drug products using suitable analytical techniques
- To undertake suitable pre-formulation studies to optimize the process of drug development
- To evaluate the pharmaceutical dosage forms and their stability testing
- To apply the quality tools for effective quality improvement of pharmaceuticals

Semester II

MPAQA 201T. ADVANCED INSTRUMENTAL ANALYSIS

Objectives: After completion of course, student is able to know,


- interpretation of the NMR, Mass and IR spectra of various organic compounds
- theoretical and practical skills of the hyphenated instruments
- identification of organic compounds

MPAQA 202T. MODERN BIO-ANALYTICAL TECHNIQUES

Objectives: Upon completion of the course, the student shall be able to understand

- Extraction of drugs from biological samples
- Separation of drugs from biological samples using different techniques
- Guidelines for BA/BE studies.

MPAQA 203T. PHARMACEUTICAL VALIDATION


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Objectives: At completion of this course, it is expected that students will be able to understand –
The concepts of calibration, qualification and validation

- The qualification of various equipment and instruments
- Process validation of different dosage forms
- Validation of analytical method for estimation of drugs
- Cleaning validation of equipment employed in the manufacture of pharmaceuticals

MPAQA 204T. PHARMACEUTICAL MANUFACTURING TECHNOLOGY

Objectives: At completion of this course, it is expected that students will be able to understand, –
The common practice in the pharmaceutical industry developments, plant layout and production planning

- Will be familiar with the principles and practices of aseptic process technology, non-sterile manufacturing technology and packaging technology.
- Have a better understanding of principles and implementation of Quality by design (QbD) and process analytical technology (PAT) in pharmaceutical manufacturing

MPAQA 205P PHARMACEUTICAL PAQA PRACTICAL II

OBJECTIVES: Upon completion of the course, student shall be able to understand


- To perform analysis of contaminants and related substances in pharmaceuticals
- To perform qualifications of instruments and processes in pharmaceutical manufacturing and analysis
- To prepare checklists and design layouts
- To apply the quality tools (QbD and PAT) for effective quality improvement of pharmaceuticals

PHARMACOLOGY

MPL 102T: ADVANCED PHARMACOLOGY - I

Objectives: Upon completion of the course the student shall be able to :

- Discuss the pathophysiology and pharmacotherapy of certain diseases


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- Explain the mechanism of drug actions at cellular and molecular level
- Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases

MPL 103T: PHARMACOLOGICAL AND TOXICOLOGICAL SCREENING METHODS - I

Objectives: Upon completion of the course the student shall be able to,

- Appraise the regulations and ethical requirement for the usage of experimental animals.
- Describe the various animals used in the drug discovery process and good laboratory practices in maintenance and handling of experimental animals
- Describe the various newer screening methods involved in the drug discovery process
- Appreciate and correlate the preclinical data to humans

MPL 104T: CELLULAR AND MOLECULAR PHARMACOLOGY

Objectives: Upon completion of the course, the student shall be able to,

- Explain the receptor signal transduction processes.
- Explain the molecular pathways affected by drugs.
- Appreciate the applicability of molecular pharmacology and biomarkers in drug discovery process.
- Demonstrate molecular biology techniques as applicable for pharmacology

MPL105P PHARMACOLOGY PRACTICAL I

OBJECTIVES: Upon completion of the course, student shall be able to understand

- The students shall be able to understand Analysis of pharmacopoeial compounds and their formulations by UV Vis spectrophotometer
- The students shall be able to handle laboratory animals.
- The students shall be able to understand various routes of drug administration

MPL 201T: ADVANCED PHARMACOLOGY - II

OBJECTIVES: Upon completion of the course the student shall be able to:

- Explain the mechanism of drug actions at cellular and molecular level


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- Discuss the Pathophysiology and pharmacotherapy of certain diseases
- Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases

MPL 202T: PHARMACOLOGICAL AND TOXICOLOGICAL SCREENING METHODS-II

Objectives: Upon completion of the course, the student shall be able to,

- Explain the various types of toxicity studies.
- Appreciate the importance of ethical and regulatory requirements for toxicity studies.
- Demonstrate the practical skills required to conduct the preclinical toxicity studies.

MPL 203T: PRINCIPLES OF DRUG DISCOVERY

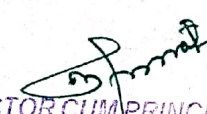
Objectives: Upon completion of the course, the student shall be able to,

- Explain the various stages of drug discovery.
- Appreciate the importance of the role of genomics, proteomics and bioinformatics in drug discovery • Explain various targets for drug discovery.
- Explain various lead seeking method and lead optimization
- Appreciate the importance of the role of computer aided drug design in drug discovery

MPL 204T: CLINICAL RESEARCH AND PHARMACOVIGILANCE

Objectives: Upon completion of the course, the student shall be able to,

- Explain the regulatory requirements for conducting clinical trial
- Demonstrate the types of clinical trial designs
- Explain the responsibilities of key players involved in clinical trials
- Execute safety monitoring, reporting and close-out activities
- Explain the principles of Pharmacovigilance
- Detect new adverse drug reactions and their assessment
- Perform the adverse drug reaction reporting systems and communication in Pharmacovigilance


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MPL205P PHARMACOLOGY PRACTICAL II

OBJECTIVES: Upon completion of the course the student shall be able to:

- The students shall be able to understand drug absorption studies by averted rat ileum preparation
- The students shall be able to understand acute oral toxicity studies as per OECD guidelines
- The students shall be able to understand ADR reporting


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