Course Outcomes (CO)

New Syllabus effective since 2021-2022

M. Pharm. (PCS) I Year / I Sem		
Course code/ Course name	**Course outcomes**	
MPH 101T Modern Pharmaceutical Analytical Techniques	MPH101.1	Understand the basic knowledge on single and multiple component assay of pharmaceuticals
	MPH101.2	Developing basic practical skills using instrumentation techniques
	MPH101.3	Skills in selecting the suitable techniques for analysis of drugs and pharmaceuticals
	MPH101.4	Basics theoretical knowledge on various instrumental techniques available for analysis of organic substances
	MPH101.5	Applying the knowledge learnt in developing new procedures and comparing various methods of analysis
(MPH 102T) Drug Delivery System	MPH102.1	To understand the various approaches for development of sustained and controlled drug delivery systems
	MPH102.2	Demonstrate development of site-specific drug delivery like buccal patch/tablet, lozenges, osmotic tablets.
	MPH102.3	Explain the design, fabrication and release mechanism of gastroretentive dosage form.
	MPH102.4	Explain the concept of palletization technology as a modulated drug delivery system.
	MPH102.5	Outline the concept of ocular and transdermal drug delivery system.
MPH 103T Modern Pharmaceutics	MPH103.1	Understand various preformulation concepts
	MPH103.2	Understand the concept of validation w.r.t. pharmaceutics
	MPH103.3	Outline the concept of cGMP and industrial management
	MPH103.4	Explore the concept of compression and compaction of tablets
	MPH103.5	Study statistical principles and implement them for biopharmaceutical studies
MPH 104T Regulatory Affairs	MPH 104.1	Understand the concept of documentation in Pharmacy Industry
	MPH 104.2	Explore the role of regulatory affairs after drug approval
	MPH 104.3	Understand the process of IND, NDA and ANDA submission
	MPH 104.4	Study the process of clinical trials

MPH 105 P Pharmaceutical Practical-I	MPH105.1	Analysis of Pharmacopoeial compounds and their formulations by UV-Vis spectrophotometer
	MPH 105.2	Explore the Experiments based on Gas Chromatography and HPLC
	MPH 105.3	Perform the Preformulation studies of tablet dosage form and to Perform In –vitro dissolution of novel drug delivery systems like controlled release or sustained release marketed formulation
	MPH 105.4	To study Micromeritic properties of powders and granulation.
	MPH 105.5	To study the effect of binders on dissolution of a tablet.
M. Pharma 1 Year / II Sem (PHARMACEUTICS) PCI		
MPH 201T Molecular Pharmaceutics (Nano Technology & Targeted DDS)	MPH201.1T	To relate the concept of targeted Drug Delivery Systems
	MPH201.2T	Development of ability to prepare and evaluate nano particles & liposomes
	MPH201.3T	To summarize the basics of preparation and application of Niosomes, Aquasomes, Phytosomes, Electrosomes
	MPH201.4T	To recall the concepts of Pulmonary Drug Delivery Systems
	MPH201.5T	Better explain the concepts of Nucleic acid based therapeutic delivery system.
MPH 202T Advanced Biopharmaceutics & Pharmacokinetics	MPH202.1T	Development of ability to understand the concept of therapeutic response and toxicity, therapeutic index, therapeutic window, factors affecting plasma concentration.
	MPH202.2T	To summarize the basics of Compartment modeling including one, two and multiple compartment models and determination of various pharmacokinetic parameters.
	MPH202.3T	To relate the concept of Non-linear pharmacokinetics and recognition of non linearity, circadian rhythm and chronopharmacokinetics, other reasons for non-linearity.
	MPH202.4T	Better explain the concepts of physiologic pharmacokinetic model and to define mean time (MRT) statistical moment theory, Mean absorption time (MAT) Mean Dissolution time (MDT).
	MPH202.5T	To recall the concepts of absorption distribution and renal excretion, hepatic clearance and elimination, bioavailability and bioequivalence
MPH203T Computer Aided Drug Delivery	MPH203.1	To understand use of computer in pharmaceutical research and statistical modelling. To understand importance of quality attributes in pharmaceutical industry.

System	MPH203.2	To brief about modelling in drug disposition techniques and transport mechanism
	MPH203.3	Applications of Computers in pharmaceutical product development and factorial design.
	MPH203.4	Attain the knowledge of computer aided clinical methodologies used in biopharmaceutical studies and simulation in ADME
	MPH203.5	Upgradation of the knowledge by studying the use of automation in pharmaceutical industry and applications of artificial intelligence.
MPH 204T Cosmetics and Cosmeceuticals	MPH204.1	Understanding of basic of cosmetic products as per Indian regulation.
	MPH204.2	Define the biological aspects cosmetic in relation skin and hair structure
	MPH204.3	Attain the knowledge the formulation consideration of skin care preparations?
	MPH204.4	Summarize the cosmeceutical products and sunscreen preparations
	MPH204.5	Applications of the Herbal Cosmetics
MPH 205 P Pharmaceutical Practical-II	MPH205.1	Estimate general considerations, methods of preparation, characterization and applications of Liposomes, Niosomes, Alginate beads, albumin microspheres and spherules
	MPH 205.2	Formulate and evaluate Creams, Shampoo and Toothpaste
	MPH 205.3	Perform the Bioavailability studies of Paracetamol in animals
	MPH 205.4	To explore the knowledge of DoE Using Design Expert® Software
	.MPH 205.5	Protein binding studies of a highly protein bound drug & poorly protein bound drug
M. Pharm. II year Semester III		
MRM 301T Research Methodology and Biostatistics	MRM301.1	Identify the overall process of designing a research study from its inception to its report.
	MRM301.2	Familiar with ethical issues in educational research, including those issues that arise in using quantitative and qualitative research
	MRM301.3	Identify a research problem stated in a study.
	MRM301.4	Why educational research is undertaken and the audiences that profit from research studies?

Old Scheme Course Outcomes

M. Pharma I Year / I Sem		
Course code/ Course name	**Course outcomes**	
MPY 101 Modern Analytical Technique	MPY101.1	Understand the basic knowledge of single and multiple component assay of pharmaceuticals
	MPY 101.2	Developing basic practical skills using instrumentation techniques
	MPY 101.3	Skills in selecting the suitable techniques for analysis of drugs and pharmaceuticals
	MPY 101.4	Basics theoretical knowledge on various instrumental techniques available for analysis of organic substances
	MPY 101.5	Applying the knowledge learned in developing new procedures and comparing various methods of analysis
MPY 102 Biotechnology and bioinformatics	MPY102.1	Understand the Structure & Function of DNA, DNA Replication & Repair, Expression of Genetic Information, Function of RNA and translation, Post translational modification
	MPY 102.2	Concept of recombinant DNA technology knowledge of Restriction enzymes, Polymerase Chain reaction. Blotting techniques, DNA sequencing, and Pharmaceutical applications.
	MPY 102.3	Understanding the gene therapy and its pharmaceutical significance.
	MPY 102.4	Study of Manufacturing and storage of vaccines. Application of immunology for the development of new vaccines. Gaining knowledge of monoclonal antibodies & hybridoma technology & its applications.
	MPY 102.5	Study of cell organization and reproduction. Understanding the communication between cell and their environment.
	MPY102.6	Application of knowledge of cancer and its treatment strategies.
	MPY102.7	Understanding the molecular mechanism o disease and invivo transgenic models, Genomic protein targets and recombinant therapeutics. Its application for rational drug design, Gene therapy & DNA/ RNA targeted therapeutics.
	MPY102.8	Exploration of biological data bases to study Sequence analysis, Protein structure, Genetic and physical mapping and importance in pharmaceutical research.
	MPY102.9	Learning of handling the biological data by descriptive statistics, Normal distribution, Probability distribution and Sampling plans.

MPY 103 Drug Regulatory Affairs, IPR and Quality assurance Techniques	MPY103.1	Understanding of regulatory requirements of pharmaceutical documentation
	MPY103.2	Basics of documentation for pharmaceutical operations
	MPY103.3	Knowledge of documents for R&D and quality operations
	MPY103.4	Understanding of validation documents for non-sterile formulations
	MPY103.5	Well versed with ICH guidelines for pharmaceutical quality system
MPY 104 Product Development and Formulation	MPY104.1	To obtain knowledge of physical, chemical, and pharmaceutical factors affecting dosage forms .
	MPY104.2	Idea of drug excipient, excipient-excipient interactions affecting formulations
	MPY104.3	Attain knowledge of solubilization and methods to enhance solubility.
	MPY104.4	To study dissolution apparatus dissolution testing of different types of dosage formulation and in-vitro and in-vivo correlation.
	MPY104.5	To update with latest tablet technology and automation in manufacturing process.
	MPY104.6	To get an insight of recent formulation strategies for parenteral and ophthalmic products.
	MPY104.7	Knowledge of pharmaceutical grade polymers and uses in formulation development.
	MPY104.8	To obtain knowledge of nutraceuticals and their usefulness in prevention of diseases.
	MPY104.9	To Obtain knowledge of different types of packages and their quality tests.
	MPY104.10	To understand importance of stability study programs for formulations and ICH guidelines for stability.
	MPY104.11	To explore application of computers in drug development process.
MPY101 Modern Analytical Techniques (Practical)	MPY101P.1	Analysis of Pharmacopoeial compounds and their formulations by UV-Vis spectrophotometer
	MPY101P.2	Explore the Experiments based on Gas Chromatography and HPLC
	MPY101P.3	Explore the instrumentation of HPTLC
MPY 102 Biotechnology & Bioinformatics (Practical)	MPY102P.1	Understand and perform the separation of subnuclear material along with its electrophoretic separation
	MPY102P.1	Explore various ELISA techniques
	MPY102P.1	Understand PCR and its applications

MPY 104 Product Development and Formulation (Practical)	MPY104P.1	Perform solubility studies with different types of BCS drug samples
	MPY104P.2	Study the physicochemical properties of different polymers and practically compare them
	MPY104P.3	Explore dissolution technique
	MPY104P.4	Study pharmaceutical packaging materials
M. Pharm. I Year Semester II		
MPY 201Pcs Biopharmaceutics and Pharmacokinetics (Advanced Pharmaceutics – I)	MPY201.1	Development of ability to understand the concept of therapeutic response and toxicity, therapeutic index, therapeutic window, factors affecting plasma concentration.
	MPY 201.2	Summarize the basics of Compartment modeling including one, two and multiple compartment models and determination of various pharmacokinetic parameters.
	MPY 201.3	Relate the concept of Non-linear pharmacokinetics and recognition of non-linearity, circadian rhythm and chronopharmacokinetics, other reasons for non-linearity.
	MPY 201.4	Explain the concepts physiologic pharmacokinetic model and to define mean time (MRT) statistical moment theory, Mean absorption time (MAT) Mean Dissolution time (MDT).
	MPY 201.5	Recall the concepts of absorption distribution and renal excretion, hepatic clearance and elimination, bioavailability and bioequivalence
MPY 202 Pcs Novel drug Delivery System-I (Advanced Pharmaceutics – II)	MPY202.1	Obtain knowledge of basics in novel drug delivery system
	MPY 202.2	Summarize the basic techniques of microencapsulation
	MPY 202.3	Summarize the study of Transdermal Drug Delivery System (TDDS)
	MPY 202.4	Explain the Implants and Inserts
	MPY 202.5	Possess Knowledge of Osmotically Regulated Systems
MPY 203 Pcs Novel drug Delivery System-II (Advanced Pharmaceutics – III)	MPY203.1	Summarize the molecular basis of targeted drug delivery
	MPY 203.2	Development of ability to understand the concept of liposomes, nanoparticles and niosomes in details
	MPY 203.3	Learn basic concept of resealed erythrocytes, dendrimers and multiple emulsions
	MPY 203.4	Explain and understand Aquasomes, Pharmacosomes and Transfersomes
	MPY 203.5	Explore peptides and protein drug delivery
MPY 204 Pcs Pharmaceutical Packaging Technology (Adanced Pharmaceutics – IV)	MPY 204.1	Understand the concept of pharmaceutical packaging and its function.
	MPY 204.2	Learn the importance of documentation
	MPY 204.3	Understand the scope of quality certifications applicable to pharmaceutical industries
	MPY 204.4	Understand the various quality control tests for packaging material.

	MPY 204.5	Understand the procedure of sterilization and stability of packaging material.
MPY 205 Pcs Lab Work	MPY 205.1	Estimate general considerations, methods of preparation, characterization and applications of Liposomes, Niosomes, Resealed Erythrocytes, Nanoparticles, Solid Lipid Nanoparticles, Dendrimers, Multiple emulsions and Submicron emulsion
	MPY 205.2	Formulate and evaluate novel drug delivery systems like sustained release matrix tablets, Mucoadhesive tablets, Microencapsules and Trans dermal patches
	MPY 205.3	Perform the Preformulation studies of tablet dosage form and to Perform In –vitro dissolution of novel drug delivery systems like controlled release or sustained release marketed formulation
	MPY 205.4	Determine the effect of process variables and excipients on tablet dosage form
	MPY 205.5	To conduct testing of packaging containers and closers.
M. Pharma II Year / III Sem (Pharmaceutics)		
MPY301PCS Elective I Modulated Release Drug Delivery System	MPY 301.1	Explain the design, fabrication and release mechanism of gastroretentive dosage form.
	MPY 301.2	Demonstrate development of site-specific drug delivery like buccal patch/tablet, lozenges, osmotic tablets.
	MPY 301.3	Illustrate the various novel patented technologies developed for various controlled and sustained/fast release oral drug delivery system like, TIMERx, MASRx, COSRx, TheriForm, etc.
	MPY 301.4	Explain the concept of pelletization technology as a modulated drug delivery system.
	MPY 301.5	Outline the concept of dispersed and colloidal drug delivery system.
MPY 302 PCS Elective II Parenteral, Inhalation & Intranasal Drug Delivery Technology	MPY302.1	Explain the basic concept of protein and peptide delivery system with formulation considerations?
	MPY 302.2	Demonstrate development of parenteral controlled drug depot systems
	MPY 302.3	Illustrate the various the Parenteral implants
	MPY 302.4	Summarize the Inhalation drug delivery systems
	MPY 302.5	Knowing the importance of Intranasal drug delivery systems