DEPARTMENT OF PHARMACY

Program : M Pharmacy Pharmaceutics / Pharmaceutical Technology

Regulation : PCI (R16) **No. of Courses : 14**

COURSE OUTCOMES

I – I Sem	**Course: Modern Pharmaceutical Analytical Techniques (MPH101T)**
CO101.1	Recall principle, operation and applications of selected instrumental spectroscopic, chromatographic analysis.
CO101.2	Gain knowledge on interpretation of NMR spectra for determination of molecular structure of compounds.
CO101.3	Build the analytical understanding in the level of ion, atom, group and molecular structure of organic and inorganic compounds with different functional groups by Mass spectroscopy and their applications in pharmacy.
CO101.4	Understand the concept of seperation and identification of compounds by chromatographic techniques.
CO101.5	Categorize different anions and cations by using suitable electrophoresis techniques.
CO101.6	Elaborate principle, theory and instruments employed for the analysis of drugs by thermal techniques.
I – I Sem	**Course: Drug Delivery Systems (MPH102T)**
CO102.1	Gain basic knowledge on sustained release, controlled release, polymer science and personalized medicine.
CO102.2	Summarize the various approaches for development of novel drug delivery systems.
CO102.3	Remember the development of formulations of gastro retentive drug delivery systems.
CO102.4	Understand the formulation and evaluation of Occular drug delivery systems.
CO102.5	Summarize the formulation and evaluation of Transdermal drug delivery systems.
CO102.6	Elaborate formulation of protein delivery and evaluate the formulated vaccine drug delivery systems.
I – I Sem	**Course: Modern Pharmaceutics (MPH103T)**
CO103.1	Illustrate the elements of preformulation studies, optimization techniques and its applications in formulation development. .
CO103.2	Develop validation and calibration master plan as per regulatory guidelines.
CO103.3	Understand the Industrial Management and GMP Considerations for the manufacturing of pharmaceuticals.
CO103.4	Know the methods of production management in industries.
CO103.5	Analyze the effects of compression and compaction in production of tablets.
CO103.6	Compile the consolidation parameters to determine the stability of a dosage form.
I – I Sem	**Course: Regulatory Affairs (MPH104T)**
CO104.1	Recall Documentation procedure in Pharmaceutical industry for drug approval process.

CO104.2	Understand the concepts of Regulatory guidance's and guidelines for filing and approval process of drugs.
CO104.3	Summarize the process of Submission of global documents in CTD/ eCTD formats.
CO104.4	Understand Post approval regulatory requirements for actives and drug products.
CO104.5	Recall Pharmacovigilence studies and process of monitoring in clinical trials.
CO104.6	Understand the guidelines and requirements for approvals for conducting clinical trials.
I – I Sem	**Course: Pharmaceutics Practical- I (MPH105PA)**
CO105.1	Identify the concentration of test compounds using HPLC, UV, GC, fluorimetry and flame photometry.
CO105.2	Estimate the amount of drug by different analytical techniques.
CO105.3	Perform In-vitro dissolution profile of CR marketed formulations.
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I – I Sem	**Course: Pharmaceutics Practical – II (MPH105PB)**
CO106.1	Formulate and evaluate different types of tablets by different manufacturing techniques.
CO106.2	Carry out preformulation studies of tablets, Powders.
CO106.3	Study Micromeritic properties of powders and granulation.
CO106.4	Study the effect of formulative additives on dissolution of tablets.
I – II Sem	**Course: Molecular Pharmaceutics (Nano Technology & Targeted DDS (MPH201T)**
CO201.1	Recall the techniques involved in design of Targeted Drug Delivery Systems.
CO201.2	Outline the principles of preparation and evaluation of Nanoparticles and Liposomes.
CO201.3	Understand the preparation, mechanism of drug release from microspheres and microcapsules. .
CO201.4	Understand the preparation and application of Niosomes, Aquasomes, Phytosomes, Electrosomes.
CO201.5	Assess the mechanism of drugs through Pulmonary Drug Delivery Systems.
CO201.6	Elaborate the role of Nucleic acid based therapeutic delivery systems in personalized medicine.
I – II Sem	**Course: Advanced Biopharmaceutics & Pharmacokinetics (MPH202T)**
CO202.1	Appreciate the importance of Drug Absorption from the Gastrointestinal Tract.
CO202.2	Illustrate factors affecting the drug absorption from GIT.
CO202.3	Outline Biopharmaceutic considerations in drug product design.
CO202.4	Demonstrate the pharmacokinetic models for the interpretation of ADME Parameters.

CO202.5	Analyze Drug Product Performance through Bioavailability and Bioequivalence studies.
CO202.6	Compile the importance and applications of Pharmacokinetics in various products.
I – II Sem	**Course: Computer Aided Drug Development (MPH203T)**
CO203.1	Understand the importance and applications of Computers in Pharmaceutical Research and Development.
CO203.2	Illustrate various stages of Quality-by-Design technique In Pharmaceutical Development.
CO203.3	Know the various approaches for Computational Modeling of Drug Disposition.
CO203.4	Summarize various softwares and modelling techniques for Computer-aided formulation development.
CO203.5	Assess the Computer-aided biopharmaceutical characterization for better therapeutic activity.
CO203.6	Appreciate the importance of the role of Artificial Intelligence (AI), Robotics and Computational fluid dynamics in drug product development.
I – II Sem	**Course: Formulation Development of Pharmaceutical and Cosmetic Products (MPH204T)**
CO204.1	Understand various Preformulation Studies for new drug substances.
CO204.2	Outline the various types of formulation Additives in product development.
CO204.3	Construct the documentation process of clinical trials. Detect new adverse drug reactions and their assessment.
CO204.4	Contrast the roles and responsibilities of Pharmacovigilance.
CO204.5	Appraise various methods of ADR reporting and tools used in Pharmacovigilance.
CO204.6	Predict principles and concepts of Pharmacoepidemiology, Pharmacoeconomics and Safety pharmacology.
I – II Sem	**Course: Pharmaceutics Practical - III (MPH205PA)**
CO205.1	Record the DRC of agonist using suitable isolated tissues preparation.
CO205.2	Evaluate the drug concentrations by various bioassay methods using isolated tissue preparations.
CO205.3	Study the effects of various drugs on isolated heart preparations.
CO205.4	Recording of rat BP, heart rate and ECG.
I – II Sem	**Course: Pharmaceutics Practical – IV (MPH205PB)**
CO206.1	Study the drug absorption studies by averted rat ileum preparation.
CO206.2	Study the acute oral and dermal toxicity studies as per OECD guidelines.
CO206.3	Design the clinical trail and ADR monitoring protocols.

CO206.4	Interpret *in-silico* pharmacophore based screening and QSAR studies by using software.
II – I Sem	**Course: Research Methodology & Biostatistics (MRM301T)**
CO301.1	Recall the concepts of research methodology which includes study design, type of studies, stratifies and different design techniques.
CO301.2	Infer the data using biostatistics technique like "t" test, ANOVA and chi square tests as well as recognize the importance of samples size and its significances.
CO301.3	Learn the history of medical research for understanding the values of clinical ethics.
CO301.4	Appraise the importance of communication and sociological relationships in medical research.
CO301.5	Understand CPCSEA guidelines for laboratory animal facilities which include handling, maintenance, record keeping and transportation of lab animals.
CO301.6	Discuss the history and basic principles of Declaration of Helsinki for medical research.
II-II Sem	**Research Work**
CO401.1	Define the fundamentals, carry out the literature review on the proposed research work and identify the problem.
CO401.2	Develop the research hypothesis.
CO401.3	Summarise the requirements in the proposed research.
CO401.4	Take part in research experiments and documented.
CO401.5	Evaluate the work done by applying statistic tools.
CO401.6	Appraise societal application and appreciation.