Program Name	Course Code	Course Name	CO No.	Course Outcome
M. PHARM SEM I (PHARMACEUTICS)	MPH101T	Modern Pharmaceutical Analytical Techniques	M101T.1	Describe the principles, instrumentation and application of various spectroscopic and assays Techniques.
			M101T.2	Discuss the quantitative and qualitative chromatographic separation and analysis of drugs with respect to its principle and instrumentation.
			M101T.3	Illustrate the principles, instrumentation and application of electrophoresis, x ray crystallography, potentiometry and thermal techniques.
	MPH102T	Drug Delivery System	M102T.1	Basic information about its approaches, formulations, technologies, and criteria for selection of drugs and polymers systems needed for Rate controlled and SR/CR formulations.
			M102T.2	The different types of Drug carrier used in the process of drug delivery which serves to improve the selectivity, effectiveness, and/or safety of drug administration.
			M102T.3	Recent developments in Vaccine, Protein and Peptide drug delivery system with respect to its formulation and evaluations parameters
	MPH103T	Modern Pharmaceutics	M103T.1	Understand elements of pre-formulation studies and its role in pharmaceutical product development
			M103T.2	Grasp knowledge about Industrial management and GMP considerations in pharmaceutical manufacturing
			M103T.3	Learn Optimization Techniques & Pilot Plant Scale Up Techniques along with Stability Testing, sterilization process & packaging of dosage forms.

M. PHARM SEM I (PHARMACEUTICS)	**MPH104T**	**Regulatory Affair**	M104T.1	Illustrate the concepts of innovator and generic drugs, their regulatory guidelines, scale-up & drug development process.
			M104T.2	Recognize the preparation of Dossiers, their submission to regulatory agencies in different countries & post approval regulatory requirements for actives and drug products.
			M104T.3	Explain the requirements for approvals for conducting clinical trials, monitoring of trials & pharmacovigilance.
	MPH105P	**Pharmaceutics Practical I**	M105P.1	Basic practical knowledge of all analytical instruments and their application in estimation of drug concentrations
			M105P.2	Formulations and evaluation concepts of all novel dosage forms
			M105P.3	Understand and apply the preformulation and micrometrics concept of various particle size and application in drug delivery

Program Name	Course Code	Course Name	CO No.	Course Outcome
M. PHARM SEM II (PHARMACEUTICS)	MPH201T	Molecular Pharmaceutics (Nano Tech and Targeted DDS)	M201T.1	Learn various approaches for development of novel drug delivery systems
			M201T.2	Comprehendcriteria for selection of drugs and polymers for the development of nano formulations
			M201T.3	Understand various formulation and evaluation techniques of novel drug delivery systems.
	MPH202T	Advanced Biopharmaceutics & Pharmacokinetics	M202T.1	Advanced information about bipopharmaceutics and pharmacokinetics related to drug and dosage forms
			M202T.2	Basic information related to use raw data and derive the pharmacokinetic models and parameters the best describe the process of drug absorption, distribution, metabolism and elimination.
			M202T.3	Applied knowledge about design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters and clinical application of pharmacokinetic models.
	MPH203T	Computer Aided Drug Delivery System	M203T.1	Elucidate the history of computers in pharmaceutical research and development as well as concept of optimization techniques in pharmaceutical formulations.
			M203T.2	Recognize use of computers in preclinical development& computational modeling in drug disposition.
			M203T.3	Explain computational fluid dynamics, artificial intelligence, robotics & computers in market analysis as well as clinical development.

M. PHARM SEM II (PHARMACEUTICS)	**MPH204T**	**Cosmetic and Cosmeceuticals**	M204T.1	Describe the regulatory provisions related to the import and manufacture of cosmetics as per the Drugs and Cosmetics Act 1940 and the Rules 1945
			M204T.2	Select key ingredients suitable in the formulation of various cosmetics and Describe the guidelines for the regulation of herbal cosmetics by private bodies
			M204T.3	Explain the various problems related to the skin and hair and design various cosmeceutical products
	MPH205P	**Pharmaceutics Practical II**	M205P.1	Formulations and evaluation concepts of all novel dosage forms
			M205P.2	Basic and advanced knowledge of all optimization techniques and their applications.
			M205P.3	Basic practical knowledge of all cosmetically formulations and their evaluations.

Program Name	Course Code	Course Name	CO No.	Course Outcome
M. PHARM SEM I (PHARMACEUTICAL CHEMISTRY)	MPC101T	**Modern Pharmaceutical Analytical Techniques**	M101T.1	Describe the principles, instrumentation and application of various spectroscopic and assays Techniques.
			M101T.2	Discuss the quantitative and qualitative chromatographic separation and analysis of drugs with respect to its principle and instrumentation.
			M101T.3	Illustrate the principles, instrumentation and application of electrophoresis, x ray crystallography, potentiometry and thermal techniques.
	MPC102T	**Advanced Organic Chemistry -I**	M102T.1	Discuss the mechanism, stereochemistry and applications of various named organic reactions, synthetic reagents with special emphasis on substitution and elimination reaction
			M102T.2	Explain the different organic intermediates involved in determining the reaction mechanism along with various protecting and de-protecting groups
			M102T.3	Discuss the disconnection approach to develop synthetic routes for small target molecule along with the chemistry, synthesis and mechanism of reactions in heterocyclic compounds
	MPC103T	**Advanced Medicinal chemistry**	M103T.1	Learn the different stages, techniques and strategies of drug design, discovery and development for biological targets & role of medicinal chemistry in drug research
			M103T.2	Explain the concepts of drug receptor interactions, drug resistance, prodrug development and peptidomimetics approach along with their applications
			M103T.3	Learn medicinal chemistry aspects of the important class of drugs along with types of Enzyme inhibition and its application in medicine

M. PHARM SEM I (PHARMACEUTICAL CHEMISTRY)	**MPC104T**	**Chemistry of Natural Products**	M104T.1	Explain the importance of natural compounds as lead molecules for new drug discovery.
			M104T.2	Elaborate isolation, purification, characterization, general methods of structural elucidation of compounds of natural origin and Explain Chemistry and Physiological significance of Vitamin
			M104T.3	Discuss rDNA technology tool for new drug discovery. Also Discuss the constituent present in crude drugs used for anti-diabetic, antitumor and liver disfunction therapy.
	MPC105P	**Pharmaceutical Chemistry Practical I**	M105P.1	Illustrate Analysis of API and their formulations by using different spectroscopic and chromatographic method.
			M105P.2	Perform synthesis, purification and characterization of compounds with known reaction rearrangement.
			M105P.3	Isolation and characterization of compounds and interpretation of UV, IR data.

Program Name	Course Code	Course Name	CO No.	Course Outcome
M. PHARM SEM II (PHARMACEUTICAL CHEMISTRY)	MPC201T	Advanced Spectral Analysis	M.201T.1	Fully comprehend concepts of UV, IR, NMR and MASS spectroscopy for interpretation of various organic compounds.
			M.201T.2	Outline the basic concept of chromatography, RIA, Thermal analysis and Raman Spectroscopy.
			M.201T.3	Recall use of various modern tool such as hyphenated instruments for analysis of organic, inorganic, and natural products.
	MPC202T	Advanced Organic Chemistry -II	M202T.1	Employ green chemistry principles and serve as an effective alternative for conventional chemistry and to use a thorough organic structure analysis.
			M202T.2	Use all catalysis in single-step and multi-step process in manufacturing of drugs and drug intermediates and also to learn more about the science of sonochemistry and chemistry of peptides.
			M202T.3	Understand stereo-chemical features including conformation and stereo electronic effects; asymmetric synthesis, reaction dynamics, and photochemical reactions.
	MPC203T	Computer Aided Drug Design	M203T.1	Design innovative drug-like compounds using a variety of molecular modelling softwares and QSAR approach.
			M203T.2	Comprehend how the QSAR, pharmacophore modelling, in silico-drug design, virtual screening techniques, and docking techniques were used in the development of novel drug candidates.
			M203T.3	Apply several software programmes for predicting physicochemical properties of molecule with special emphasis on pharmacophore concept and de novo drug design.

M. PHARM SEM II (PHARMACEUTICAL CHEMISTRY)	**MPC204T**	**Pharmaceutical Process Chemistry**	M204T.1	Understand the strategies for scale up process and impurities in the API.
			M204T.2	Illustrate the various unit operations and unit processes.
			M204T.3	Discuss the industrial safety, Hazard labels, Fire hazards, ISO-14001 and OHSAS 18000.
	MPC205P	**Pharmaceutical Chemistry Practical II**	M205P.1	Perform Synthesis of organic compounds by different approaches like Oxidation, Reduction/hydrogenation & Nitration and interpretation, identification of organic compounds by FT-IR, NMR, MASS spectra
			M205P.2	Preparation of different organic compounds with known reaction mechanism
			M205P.3	etermine Lipinski's rule of 5, calculation of ADMET Properties and its analysis using software and Pharmacophore modelling using 2D, 3D QSAR, docking study

Program Name	Course Code	Course Name	CO No.	Course Outcome
M. PHARM SEM I (PHARMACOLOGY)	MPL101T	Modern Pharmaceutical Analytical Techniques	M101T.1	Describe the principles, instrumentation and application of various spectroscopic and assays Techniques.
			M101T.2	Discuss the quantitative and qualitative chromatographic separation and analysis of drugs with respect to its principle and instrumentation.
			M101T.3	Illustrate the principles, instrumentation and application of electrophoresis, x ray crystallography, potentiometry and thermal techniques.
	MPL102T	Advanced Pharmacology-I	M102T.1	Discuss the pathophysiology and pharmacotherapy of different diseases
			M102T.2	Elaborate the updated information about mechanism of drug actions at cellular and molecular level so as to correlate with research problems
			M102T.3	Provide detailed mechanisms of the adverse effects, explain and correlate contraindications and clinical uses of drugs used in treatment of diseases so as to utilize them in clinical data analysis and patient counseling
	MPL103T	Pharmacological and Toxicological Screening Methods-I	M103T.1	Appraise and critically discuss the regulations and ethical requirement for the usage of experimental animals.
			M103T.2	Describe the various animals used in the drug discovery process and good laboratory practices in maintenance and handling of experimental animals so as to observe strict adherence to ethical practices in drug research and development
			M103T.3	Describe the various newer screening methods involved in the drug discovery process and correlate such preclinical data to humans

M. PHARM SEM I (PHARMACOLOGY)	**MPL104T**	**Cellular and Molecular Pharmacology**	M104T.1	Critically discuss and elaborate signal transduction mechanisms and molecular pathways affected by drugs
			M104T.2	Comprehend and utilize the applicability of molecular pharmacology and biomarkers in drug discovery process
			M104T.3	Demonstrate molecular biology techniques as applicable for Pharmacology so as to use and emphasize evidence based and ethical methods in laboratory research
	MPL105P	**Pharmacology Practical I**	M105P.1	Demonstrate the ability to exercise good laboratory practices during day to day laboratory work
			M105P.2	Design experimental protocols, plan experimental activity with due consideration to cost and duration and adhere to the planned protocols
			M105P.3	Demonstrate the ability to work in a research team with total dedication and commitment to social and ethical responsibilities and regional relevant health problems associated with it

Program Name	Course Code	Course Name	CO No.	Course Outcome
M. PHARM SEM II (PHARMACOLOGY)	MPL201T	Advanced Pharmacology II	M201T.1	Explain mechanism of drugs acting on Endocrine, GIT, Alzheimer, Parkinson's, Cancer and DM
			M201T.2	Describe the mechanisms at cellular and molecular level of chemotherapeutic and Immuno-pharmacological agents.
			M201T.3	Illustrate the applications of chronotherapy in CVS, DM, Asthma and Peptic ulcer as well as protective activity of antioxidants, role of free radicals in DM, Neurodegenarative diseases and cancer
	MPL202T	Pharmacological and Toxicological Screening Methods-II	M202T.1	Explain history of drug development and regulatory guidelines for toxicity studies as per OECD, ICH, EPA & Schedule Y, Principles of GLP
			M202T.2	Discuss reproductive, geno, terato, carcino, dermal, oral, inhalation toxicity as well as toxicokinetics evaluation in preclinical studies
			M202T.3	Describe studies of IND, Safety pharmacology as well as alternative methods for animal toxicity
	MPL203T	Principles of Drug Discovery	M203T.1	Demonstrate the ability to use bioinformatic, genomic and proteomic tools in drug discovery, work out experimental study design and data analysis
			M203T.2	Comprehensively discuss and analyze the process of target and lead identification, optimization and validation essential to be a part of drug research team
			M203T.3	Demonstrate the ability to use various freewares and databases involved in computer aided drug design & discovery

M. PHARM SEM II (PHARMACOLOGY)	**MPL204T**	**Clinical Research and Pharamcovigilance**	M204T.1	Demonstrate the types of clinical trial designs and Explain the regulatory requirements for conducting clinical trial
			M204T.2	Explain the responsibilities of key players involved in clinical trials and Execute safety monitoring, reporting and close-out activities
			M204T.3	Explain the principles of Pharmacovigilance, detect new adverse drug reactions and their assessment and perform the adverse drug reaction reporting systems and communication in Pharmacovigilance
	MPL205P	**Pharmacology Practical II**	M205P.1	Demonstrate good laboratory practices during laboratory work
			M205P.2	Design experimental protocols, plan experimental activity with due consideration to ethical and social requirements
			M205P.3	Perform laboratory experimental work in a research team, communicate, discuss and plan experimental work