S.NO	NAME OF THE PROGRAMME	NAME O F THE SUBJECT		COURSE OUTCOMES
		PHARMACEUTICS		
1	I M. Pharmacy I Semester	**Modern Pharmaceutical Analytical Techniques**	CO 1	Chemicals and Excipients
			CO 2	The analysis of various drugs in single and combination dosage forms
			CO 3	Theoretical and practical skills of the instruments
2		**Drug delivery systems**	CO 1	The various approaches for development of novel drug deliverysystems.
			CO 2	The criteria for selection of drugs and polymers for the development ofdelivering system
			CO 3	The formulation and evaluation of Novel drug delivery systems
3		**Modern Pharmaceutics**	CO 1	The elements of preformulation studies.
			CO 2	The Active Pharmaceutical Ingredients and Generic drug Productdevelopment
			CO 3	Industrial Management and GMP Considerations.
			CO 4	Optimization Techniques & Pilot Plant Scale Up Techniques
			CO 5	Stability Testing, sterilization process & packaging of dosage forms
4		**Regulatory affairs**	CO 1	The Concepts of innovator and generic drugs, drug developmentprocess

			CO 2	The Regulatory guidance's and guidelines for filing and approvalprocess
			CO 3	Preparation of Dossiers and their submission to regulatory agencies indifferent countries
			CO 4	Post approval regulatory requirements for actives and drug products
			CO 5	Submission of global documents in CTD/ eCTD formats
			CO 6	Clinical trials requirements for approvals for conducting clinical trials
			CO 7	Pharmacovigilence and process of monitoring in clinical trials
1	I M. Pharmacy II Semester	**Molecularpharmaceutics (Nanotechnology & Targeted DDS)**	CO 1	The various approaches for development of novel drug delivery systems.
			CO 2	The criteria for selection of drugs and polymers for the development of NTDS
			CO 3	The formulation and evaluation of novel drug delivery systems.
2		**Advanced Biopharmaceutics & Pharmacokinetics**	CO 1	The basic concepts in biopharmaceutics and pharmacokinetics.
			CO 2	The use raw data and derive the pharmacokinetic models and parameters the best describe the process of drug absorption, distribution, metabolism and elimination.
			CO 3	The critical evaluation of biopharmaceutic studies

				involving drug product equivalency.
			CO 4	The design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.
			CO 5	The potential clinical pharmacokinetic problems and application of basics of pharmacokinetic
3		**Computer Aided Drug Delivery System**	CO 1	History of Computers in Pharmaceutical Research and Development
			CO 2	Computational Modeling of Drug Disposition
			CO 3	Computers in Preclinical Development
			CO 4	Optimization Techniques in Pharmaceutical Formulation
			CO 5	Computers in Market Analysis
			CO 6	Computers in Clinical Development
			CO 7	Artificial Intelligence (AI) and Robotics
			CO 8	Computational fluid dynamics(CFD)
4		**Cosmetics And Cosmeceuticals**	CO 1	Key ingredients used in cosmetics and cosmoceuticals.
			CO 2	Key building blocks for various formulations.
			CO 3	Current technologies in the market

			CO 4	Various key ingredients and basic science to develop cosmetics and cosmeceuticals
			CO 5	Scientific knowledge to develop cosmetics and cosmeceuticals with desired Safety, stability, and efficacy.
PHARMACOLOGY				
1	I M. Pharmacy I Semester	**Modern Pharmaceutical Analytical Techniques**	CO 1	Chemicals and Excipients
			CO 2	The analysis of various drugs in single and combination dosage forms
			CO 3	Theoretical and practical skills of the instruments
2		**Advanced Pharmacology - I**	CO 1	Discuss the pathophysiology and pharmacotherapy of certain diseases
			CO 2	Explain the mechanism of drug actions at cellular and molecular level
			CO 3	Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases
3		**Pharmacological And Toxicological Screening Methods - I**	CO 1	Appraise the regulations and ethical requirement for the usage of experimental animals.
			CO 2	Describe the various animals used in the drug discovery process and good laboratory practices in maintenance and handling of experimental animals
			CO 3	Describe the various newer screening methods involved in the drug discovery process

			CO 4	Appreciate and correlate the preclinical data to humans
4		**Cellular and Molecular Pharmacology**	CO 1	Explain the receptor signal transduction processes.
			CO 2	Explain the molecular pathways affected by drugs.
			CO 3	Appreciate the applicability of molecular pharmacology and biomarkers in drug discovery process.
			CO 4	Demonstrate molecular biology techniques as applicable for pharmacology
1	I M. Pharmacy II Semester	**Advanced Pharmacology - II**	CO 1	Explain the mechanism of drug actions at cellular and molecular level
			CO 2	Discuss the Pathophysiology and pharmacotherapy of certain diseases
			CO 3	Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases
2		**Pharmacological and Toxicological Screeningmethods-II**	CO 1	Explain the various types of toxicity studies.
			CO 2	Appreciate the importance of ethical and regulatory requirements for toxicity studies.
			CO 3	Demonstrate the practical skills required to conduct the preclinical toxicity studies.
3		**Principles of Drug Discovery**	CO 1	Explain the various stages of drug discovery.
			CO 2	Appreciate the importance of the role of genomics, proteomics and bioinformatics in drug discovery

			CO 3	Explain various targets for drug discovery.
			CO 4	Explain various lead seeking method and lead optimization
			CO 5	Appreciate the importance of the role of computer aided drug design in drug discovery
4		**Clinical Research And Pharmacovigilance**	CO 1	Explain the regulatory requirements for conducting clinical trial
			CO 2	Demonstrate the types of clinical trial designs
			CO 3	Explain the responsibilities of key players involved in clinical trials
			CO 4	Execute safety monitoring, reporting and close-out activities
			CO 5	Explain the principles of Pharmacovigilance
			CO 6	Detect new adverse drug reactions and their assessment
			CO 7	Perform the adverse drug reaction reporting systems and communication in Pharmacovigilance
PHARMACEUTICAL CHEMISTRY				
1	I M. Pharmacy I Semester	**Modern Pharmaceutical Analytical Techniques**	CO 1	The analysis of various drugs in single and combination dosage forms
			CO 2	Theoretical and practical skills of the instruments
2		**Advanced Organic Chemistry - I**	CO 1	The principles and applications of reterosynthesis
			CO 2	The mechanism & applications of various named reactions

			CO 3	The concept of disconnection to develop synthetic routes for small target molecule.
			CO 4	The various catalysts used in organic reactions
			CO 5	The chemistry of heterocyclic compounds
3		**Advanced Medicinal Chemistry**	CO 1	Different stages of drug discovery
			CO 2	Role of medicinal chemistry in drug research
			CO 3	Different techniques for drug discovery
			CO 4	Various strategies to design and develop new drug like molecules for biological targets
			CO 5	Peptidomimetics
4		**Chemistry of Natural Products**	CO 1	Different types of natural compounds and their chemistry and medicinal importance
			CO 2	The importance of natural compounds as lead molecules for new drug discovery
			CO 3	The concept of rDNA technology tool for new drug discovery
			CO 4	General methods of structural elucidation of compounds of natural origin
			CO 5	Isolation, purification and characterization of simple chemical constituents from natural source
1	I M. Pharmacy II Semester	**Advanced Spectral Analysis**	CO 1	Interpretation of the NMR, Mass and IR spectra of various organic compounds

			CO 2	Theoretical and practical skills of the hyphenated instruments
			CO 3	Identification of organic compounds
2		**Advanced Organic Chemistry - II**	CO 1	The principles and applications of Green chemistry
			CO 2	The concept of peptide chemistry.
			CO 3	The various catalysts used in organic reactions
			CO 4	The concept of stereochemistry and asymmetric synthesis.
3		**Computer Aided Drug Design**	CO 1	Role of CADD in drug discovery
			CO 2	Different CADD techniques and their applications
			CO 3	Various strategies to design and develop new drug like molecules.
			CO 4	Working with molecular modeling software's to design new drug molecules
4		**Pharmaceutical Process Chemistry**	CO 1	The strategies of scale up process of ap is and intermediates
			CO 2	The various unit operations and various reactions in process chemistry
PHARMACEUTICAL ANALYSIS & QUALITY ASSURANCE				
1	I M. Pharmacy I Semester	**Modern Pharmaceutical Analytical Techniques**	CO 1	Chemicals and Excipients
			CO 2	The analysis of various drugs in single and combination dosage forms
			CO 3	Theoretical and practical skills of the instruments
2			CO 1	The importance of quality

		Quality Management Systems	CO 2	ISO management systems
			CO 3	Tools for quality improvement
			CO 4	Analysis of issues in quality
			CO 5	Quality evaluation of pharmaceuticals
			CO 6	Stability testing of drug and drug substances
			CO 7	Statistical approaches for quality
3		**Quality Control and Quality Assurance**	CO 1	Understand the cGMP aspects in a pharmaceutical industry
			CO 2	To appreciate the importance of documentation
			CO 3	To understand the scope of quality certifications applicable to Pharmaceutical industries
			CO 4	To understand the responsibilities of QA & QC departments.
4		**Audits And Regulatory Compliance**	CO 1	To understand the importance of auditing
			CO 2	To understand the methodology of auditing
			CO 3	To carry out the audit process
			CO 4	To prepare the auditing report
			CO 5	To prepare the check list for auditing
1	I M. Pharmacy II Semester	**Hazards and Safety Management**	CO 1	Understand about environmental problems among learners.
			CO 2	Impart basic knowledge about the environment and its allied problems.
			CO 3	Develop an attitude of concern for the industry environment.

			CO 4	Ensure safety standards in pharmaceutical industry
			CO 5	Provide comprehensive knowledge on the safety management
			CO 6	Empower an ideas to clear mechanism and management in different kinds of hazard management system
			CO 7	Teach the method of Hazard assessment, procedure, methodology for provide safe industrial atmosphere.
2		**Pharmaceutical Validation**	CO 1	The concepts of calibration, qualification and validation
			CO 2	The qualification of various equipments and instruments
			CO 3	Process validation of different dosage forms
			CO 4	Validation of analytical method for estimation of drugs
			CO 5	Cleaning validation of equipments employed in the manufacture of pharmaceuticals
3		**Advanced Pharmaceutical Analysis**	CO 1	Appropriate analytical skills required for the analytical method development.
			CO 2	Principles of various reagents used in functional group analysis that renders necessary support in research methodology and demonstrates its application in the practical related problems.
			CO 3	Analysis of impurities in drugs, residual solvents and stability

				studies of drugs and biological products
4		**Modern Bio-Analytical Techniques**	CO 1	Extraction of drugs from biological samples
			CO 2	Separation of drugs from biological samples using different techniques
			CO 3	Guidelines for BA/BE studies.
PHARMACEUTICAL ANALYSIS				
1	I M. Pharmacy I Semester	**Modern Pharmaceutical Analytical Techniques**	CO 1	The analysis of various drugs in single and combination dosage forms
			CO 2	Theoretical and practical skills of the instruments
2		**Advanced Pharmaceutical Analysis**	CO 1	Appropriate analytical skills required for the analytical method development.
			CO 2	Principles of various reagents used in functional group analysis that renders necessary support in research methodology and demonstrates its application in the practical related problems.
			CO 3	Analysis of impurities in drugs, residual solvents and stability studies of drugs and biological products
3		**Pharmaceutical Validation**	CO 1	Explain the aspect of validation
			CO 2	Carryout validation of manufacturing processes
			CO 3	Apply the knowledge of validation to instruments and equipments

			CO 4	Validate the manufacturing facilities
4		**Food Analysis**	CO 1	Food constituents
			CO 2	Food additives
			CO 3	Finished food products
			CO 4	Pesticides in food
			CO 5	And also student shall have the knowledge on food regulations and legislations
1	I M. Pharmacy II Semester	**Advanced Instrumental Analysis**	CO 1	Interpretation of the NMR, Mass and IR spectra of various organic compounds
			CO 2	Theoretical and practical skills of the hyphenated instruments
			CO 3	Identification of organic compounds
2		**Modern Bio-Analytical Techniques**	CO 1	Extraction of drugs from biological samples
			CO 2	Separation of drugs from biological samples using different techniques
			CO 3	Guidelines for BA/BE studies.
3		**Quality Control And Quality Assurance**	CO 1	The cGMP aspects in a pharmaceutical industry
			CO 2	To appreciate the importance of documentation
			CO 3	To understand the scope of quality certifications applicable to Pharmaceutical industries
			CO 4	To understand the responsibilities of QA & QC departments

4		**Herbal And Cosmetic Analysis**	CO 1	Determination of herbal remedies and regulations
			CO 2	Analysis of natural products and monographs
			CO 3	Determination of Herbal drug-drug interaction
			CO 4	Principles of performance evaluation of cosmetic products.
PHARMACEUTICAL REGULATORY AFFAIRS				
1	I M. Pharmacy I Semester	**Good Regulatory Practices**	CO 1	The key regulatory and compliance elements with respect to Good Manufacturing Practices, Good Laboratory Practices, Good Automated Laboratory Practices and Good Documentation Practices.
			CO 2	Prepare and implement the check lists and SOPs for various Good Regulatory Practices
			CO 3	Implement Good Regulatory Practices in the Healthcare and related Industries
			CO 4	Prepare for the readiness and conduct of audits and inspections.
2		**Documentation And Regulatory Writing**	CO 1	Know the various documents pertaining to drugs in pharmaceutical industry
			CO 2	Understand the basics of regulatory compilation
			CO 3	Create and assemble the regulation submission as per the requirements of agencies

			CO 4	Follow up the submissions and post approval document requirements
3		**Clinical Research Regulations**	CO 1	History, origin and ethics of clinical and biomedical research and evaluation
			CO 2	Clinical drug, medical device development process and different types and phases of clinical trials
			CO 3	Regulatory requirements and guidance for conduct of clinical trials and research
4		**Regulations And Legislation For Drugs & Cosmetics,Medical Devices, Biologicals & Herbals, And Food &Nutraceuticals In India And Intellectual Propertyrights**	CO 1	Know different Acts and guidelines that regulate Drugs & Cosmetics
			CO 2	Understand the approval process and regulatory requirements for Drugs & Cosmetics
1	I M. Pharmacy II Semester	**Regulatory Aspects Of Drugs & Cosmetics**	CO 1	Process of drug discovery and development and generic product development
			CO 2	Regulatory approval process and registration procedures for API and drug products in US, EU
			CO 3	Cosmetics regulations in regulated and semi-regulated countries
			CO 4	A comparative study of India with other global regulated markets
2		**Regulatory Aspects Of Herbal And Biologicals**	CO 1	Know the regulatory Requirements for Biologics and Vaccines

			CO 2	Understand the regulation for newly developed biologics and biosimilars
			CO 3	Know the pre-clinical and clinical development considerations of biologics
			CO 4	Understand the Regulatory Requirements of Blood and/or Its Components Including Blood Products and label requirements
3		**Regulatory Aspects Of Medical Devices**	CO 1	Basics of medical devices and IVDs, process of development, ethical and quality considerations
			CO 2	Harmonization initiatives for approval and marketing of medical devices and IVDs
			CO 3	Regulatory approval process for medical devices and IVDs in India, US, Canada, EU, Japan and ASEAN
			CO 4	Clinical evaluation and investigation of medical devices and IVDs
4		**Regulatory Aspects Of Food & Nutraceuticals**	CO 1	Know the regulatory Requirements for nutraceuticals
			CO 2	Understand the regulation for registration and labeling of nutraceuticals and food supplements in India, USA and Europe.