KHARVEL SUBHARTI COLLEGE OF PHARMACY

Name of the Program with program code: Master of Pharmacy (PH-02)
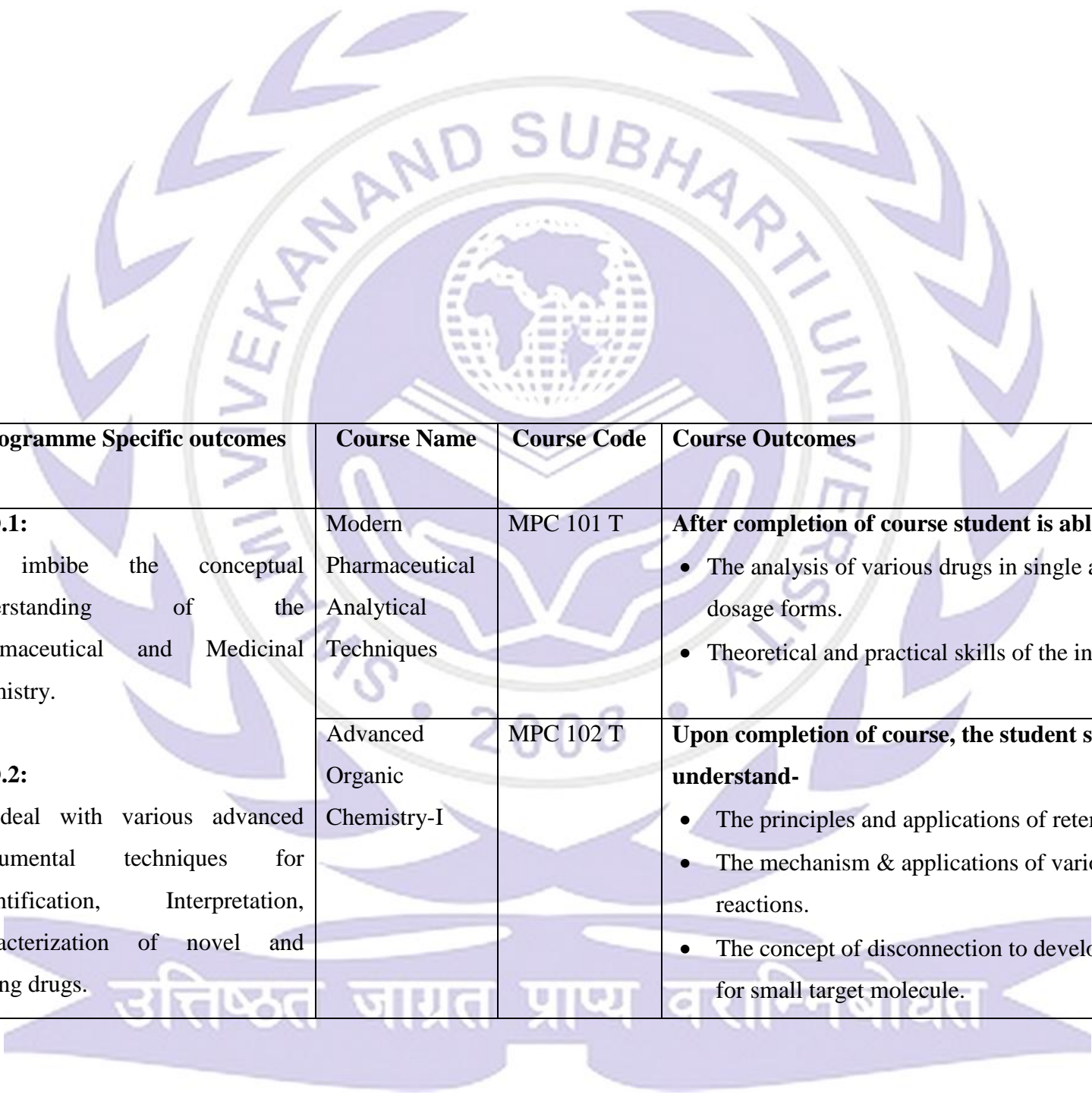
Programme Name	Programme Specific Outcomes	Course Name	Course Code	Course Outcomes
M. Pharm. (Pharmaceutics)	**PSO.1:** Impart knowledge on the novel drug delivery systems, approaches, criteria for selection of polymers and drugs and their formulation and evaluation.	Modern Pharmaceutical Analytical Techniques	MPH 101 T	**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.
	PSO.2: To know various preformulation elements, industrial management and GMP considerations, Pilot Plant Scale up Techniques, Stability testing, sterilization and packaging of dosage forms.	Drug Delivery System	MPH102 T	**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.
	PSO.3: To impart knowledge and skills in	Modern Pharmaceutics	MPH 103 T	**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.

	generic drug development, various regulatory filings the approval process, and concept of generics across the globe.			• Industrial Management and GMP Considerations. • Optimization Techniques & Pilot Plant Scale Up Techniques. • Stability Testing, sterilization process & packaging of dosage forms.
	PSO.4: To impart knowledge and skills for dose calculations, dose adjustments and apply bio pharmaceutics theories in practical problem solving. The pharmacokinetic models, bioequivalence and potential clinical pharmacokinetic problem analysis. **PSO.5:** Skill development in Pharmaceutical research, Pharmacoinformatics, in drug development in Computational modelling, Preclinical development, clinical development, Artificial	Regulatory Affair	MPH 104 T	**Upon completion of the course, it is expected that the students will 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. • Pharmacovigilence and process of monitoring in clinical trials.
		Molecular Pharmaceutics	MPH 201 T	**Upon completion of the course student shall be able to understand-**

	Intelligence and Robotics, and Computational fluid dynamics.			• 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.
	PSO.6: To impart knowledge and skills necessary for cosmetics and cosmeceuticals, their safety and efficacy and current technologies in cosmetic industry. **PSO.7:** To gain knowledge in use of advanced instrumentation, formulation and evaluation of controlled release formulations, floating drug delivery systems, transdermal drug delivery systems, micromeritics, and mathematical simulations.	Advanced Biopharmaceutics & Pharmacokinetics	MPH 202 T	**Upon completion of this course it is expected that students will be able 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 pharmacokinetics.
		Computer Aided Drug delivery	MPH 203 T	**Upon completion of this course it is expected that students will be able to understand**

	PSO.8: To train the students and develop their technical skill knowledge in computer simulations, population modelling, in vitro and in vivo studies.	System		• 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).
	PSO.9: To create a talent pool by involving students in research projects and to make students undertake research projects under faculty guidance for publication. **PSO.10:** To foster ambitious desire among students to undertake higher studies and career growth.	Cosmetic & Cosmeceuticals	MPH 204 T	**Upon completion of the course, the students 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. • Scientific knowledge to develop cosmetics and cosmeceuticals with desired Safety, stability, and efficacy.

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M.Pharm (Pharmaceutical Chemistry)	**PSO.1:** To imbibe the conceptual understanding of the Pharmaceutical and Medicinal chemistry.	Modern Pharmaceutical Analytical Techniques	MPC 101 T	**After completion of course student is able to know-** • The analysis of various drugs in single and combination dosage forms. • Theoretical and practical skills of the instruments.
	PSO.2: To deal with various advanced instrumental techniques for Quantification, Interpretation, characterization of novel and exiting drugs.	Advanced Organic Chemistry-I	MPC 102 T	**Upon completion of course, the student shall be to understand-** • The principles and applications of reterosynthesis. • The mechanism & applications of various named reactions. • The concept of disconnection to develop synthetic routes for small target molecule.

			• The various catalysts used in organic reactions.
PSO.3:			• The chemistry of heterocyclic compounds.
To impart knowledge on single step and multi-step synthetic reactions, identification and interpretation of intermediates and conversion into final products.	Advanced Medicinal Chemistry	MPC 103 T	**At completion of this course it is expected that students will be able to understand-** • Different stages of drug discovery. • Role of medicinal chemistry in drug research. • Different techniques for drug discovery. • Various strategies to design and develop new drug like molecules for biological targets. • Peptidomimetics.
PSO.4: To know the Pharmacopieal assays by spectroscopical methods, calibration techniques, determination of preservatives, vitamin contents in drugs and foods. **PSO.5:** To create knowledge with various hyphenated analytical instrumental techniques for identification, characterization, and quantification of drugs.	Chemistry of Natural Products	MPC 104 T	**At completion of this course it is expected that students will be able to understand-** • Different types of natural compounds and their chemistry and medicinal importance. • The importance of natural compounds as lead molecules for new drug discovery. • The concept of rDNA technology tool for new drug discovery. • General methods of structural elucidation of compounds of natural origin. • Isolation, purification and characterization of simple chemical constituents from natural source.
PSO.6:	Advanced	MPC 201 T	**At completion of this course it is expected that students will**

To impart knowledge about extraction, separation of drugs from biological samples using different techniques and guidelines for analytical methods. **PSO.7:** To know about quality assurance aspects of pharmaceutical industries such as CGMP, Documentations, certifications, GLP, and other regulatory affairs. **PSO.8:** To create a talent pool by involving students in research projects and to make students undertake small and large research projects/grants under faculty guidance for higher qualification. **PSO.9:** To promote ambitious desire among students to undertake higher	Spectral Analysis		**be able to understand** • Interpretation of the NMR, Mass and IR spectra of various organic compounds. • Theoretical and practical skills of the hyphenated instruments. • Identification of organic compounds.
	Advanced Organic Chemistry-II	MPC 202 T	**Upon completion of course, the student shall able to understand-** • The principles and applications of Green chemistry. • The concept of peptide chemistry. • The various catalysts used in organic reactions. • The concept of stereochemistry and asymmetric synthesis.
	Computer Aided Drug Design	MPC 203 T	**At completion of this course it is expected that students will be able to understand-** • Role of CADD in drug discovery. • Different CADD techniques and their applications. • Various strategies to design and develop new drug like molecules. • Working with molecular modelling software's to design new drug molecules • The in silico virtual screening protocols.
	Pharmaceutical Process	MPC 204 T	**At completion of this course it is expected that students will be able to understand-**

| | | studies. | Chemistry | | • The strategies of scale up process of apis and intermediates.
• The various unit operations and various reactions in process chemistry. |

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M.Pharm **(Pharmacology)**	**PSO.1:** Relate the acquired scientific information and principles of pharmacokinetics and pharmacodynamics in drug discovery process.	Modern Pharmaceutical Analytical Techniques	MPL 101 T	**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.
		Advanced Pharmacology-I	MPL 102 T	**Upon completion of the course the student shall be able to-**

	PSO.2: Interpret data of pharmaceutical experiments in drug discovery as per the needs of pharmaceutical industries. **PSO.3:** Translate the high-level of understanding of drug action into key stages in preclinical and clinical research studies. **PSO.4:** Demonstrate knowledge of professional and ethical responsibilities in clinical and non-clinical laboratory as required by regulatory bodies. **PSO.5:** Evaluate current drug information in the delivery of		• Discuss the pathophysiology and pharmacotherapy of certain diseases. • 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.
		Pharmacological and Toxicological screening Methods-I MPL 103 T	**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.
		Cellular and Molecular Pharmacology MPL 104 T	**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

	pharmaceutical care and assure in regard to drug usage and their adverse effects.			pharmacology and biomarkers in drug discovery process. • Demonstrate molecular biology techniques as applicable for pharmacology.
	PSO.6: Appraise pharmacological model for investigation through logics and problem solving ability. **PSO.7:** Retrieve, analyze, interpret and formulate drug or medicine information.	Advanced Pharmacology-II	MPL 201 T	**Upon completion of the course the student shall be able to-** • Explain the mechanism of drug actions at cellular and molecular level. • Discuss the Pathophysiology and pharmacotherapy of certain diseases. • Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases.
		Pharmacological and Toxicological screening Methods-II	MPL 202 T	**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.
		Principles of Drug Discovery	MPL 203 T	**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.
		Clinical Research and Pharmacovigilance	MPL 204 T	**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.