PQA-MPL 101T: Modern Pharmaceutical Analytical Techniques (THEORY)

This subject deals with various advanced analytical instrumental techniques for identification, characterization and quantification of drugs. Instruments dealt are NMR, Mass spectrometer, IR, HPLC, GC etc.  
After completion of the course, a student is able to know  
CO 1:The analysis of various drugs in single and combination dosage forms  
CO 2:Theoretical knowledge of the instruments  
CO 3:Selection of suitable analytical method for a given analysis.

PHA-MPL 102T: Advanced Pharmacology I

The subject is designed to strengthen the basic knowledge in the field of pharmacology and recent advances in the drugs used for the treatment of diseases. In addition, this subject helps the students to understand the concepts of drug action and mechanisms involved.  
Upon completion of the course, the student shall be able to:  
CO 1:Discuss the pathophysiology and pharmacotherapy of certain diseases  
CO 2:Explain the mechanism of drug actions at cellular and molecular levels  
CO 3:Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases

PHA-MPL 103T Pharmacological and Toxicological Screening Methods I

This subject is designed to impart knowledge on preclinical evaluation of drugs and recent experimental techniques in the drug discovery and development.  
This subject also helps the students to understand the maintenance of laboratory animals as per the guidelines, basic knowledge of various in-vitro and in-vivo preclinical evaluation procedures.  
Upon completion of this course, student shall be able to  
CO 1:Appraise the regulations and ethical requirement for the usage of experimental animals.  
CO 2:Describe the various animal models and screening techniques used in drug discovery process.  
CO 3:Describe the various newer screening methods involved in the drug discovery process.  
CO 4:Appreciate and correlate the preclinical data to humans

PHA-MPL 104T Cellular and Molecular Pharmacology

This subject imparts a fundamental knowledge of the structure and functions of cellular components and helps to understand the interaction of these components with drugs.  
This information will further help the student to apply the knowledge in drug discovery process.  
Upon completion of this course, student shall be able to  
CO 1:Explain the receptor signal transduction processes  
CO 2:Describe the molecular pathways affected by drugs  
CO 3:Comprehend the principles and applications of genomic and proteomic tools  
CO 4:Appreciate the applicability of molecular pharmacology and biomarkers in drug discovery process  
CO 5:Demonstrate molecular biology techniques as applicable for pharmacology
**PH-A MPL 105P: Pharmacology Practical – I (Practical)**

This subject is designed to gain practical skills on various preclinical testing procedures of drugs and recent experimental techniques in the drug discovery and development.

This subject also helps the students to understand the maintenance of laboratory animals as per the guidelines, basic knowledge of various in-vitro and in-vivo preclinical evaluation procedures.

Upon completion of this course, the student should be able to:
- CO 1: Understand the ethical consideration governing the animal experimentation and learn the best practices for safe handling of animals. Explain the regulations and ethical requirement for the usage of experimental animals.
- CO 2: Experiment and analyze to identify, and estimate pharmaceutical active ingredients/formulation using various instrumental techniques.
- CO 3: Plan, design and interpret preclinical evaluation techniques for drug discovery process.
- CO 4: Critically analyze the various animal models used in drug discovery process.
- CO 5: Correlate the preclinical data to humans.

**PH-A MPL 106S: Seminar**

The subject is designed to create an environment where teachers provide the students with a critical eye and openness to fortify the presentation and academic writing skills of students in the field of Pharmacology.

Upon completion of the course, the student shall be able to:
- CO 1: Develop skills to gather, organize, deliver information and defend a given topic in pharmacology.
- CO 2: Learn to organize complex pharmacology concepts using audio-visual aids.
- CO 3: Acquire communication and presentation skills.
- CO 4: Effectively respond to the questions raised by peers and stand scientific scrutiny.
- CO 5: Develop a write-up on the subject of seminar presentation.
- CO 6: Cultivate a sense of upgradation of knowledge through self and continuous learning.

**PH-A MPL 201T: Advanced Pharmacology II**

The subject is designed to strengthen the basic knowledge in the field of pharmacology and to impart recent advances in the drugs used for the treatment of various diseases. Besides, this subject helps the students to understand the concepts of drug action and mechanisms involved.

Upon completion of the course, the student shall be able to:
- CO 1: Explain the mechanism of drug actions at cellular and molecular levels.
- 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.

**PH-A MPL 202T: Pharmacological and Toxicological Screening Methods II**

This subject imparts knowledge on the preclinical safety and toxicological evaluation of drug & new chemical entity. This knowledge will make the student competent in regulatory toxicological evaluation.

Upon completion of the course, the student shall be able to:
- 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 pre-clinical toxicity studies.
**PHA-MPL 203T: Principles of Drug Discovery**

This subject imparts basic knowledge of drug discovery process. This information will make the student competent in DDD

Upon completion of the course, the student shall be able to:
- CO 1: Explain the process of drug discovery and development
- CO 2: Appreciate the importance of role of genomics, proteomics and bioinformatics in drug discovery process
- CO 3: Explain the drug targets in drug discovery process
- CO 4: Explain lead seeking methods and lead optimization
- CO 5: Appreciate the importance of the role of computer-aided drug design in drug discovery

**PHA-MPL 204T: Clinical Research and Pharmacovigilance**

This subject will provide value addition and current requirement for the students in clinical research and pharmacovigilance. It Conceptualizing, designing, conducting, managing and reporting of clinical trials, will be discussed This subject also focuses on global scenario of pharmacovigilance in different methods that can be used to generate safety data. It will teach the students in developing drug safety data in pre-clinical, clinical phases of drug development and post-marketing surveillance will be detailed

Upon completion of this course, the student should be able to:
- CO 1: Explain the regulatory requirements for conducting a 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

**PHA-MPL 205P: PHARMACOLOGY PRACTICAL – II (Practical)**

This subject is designed to gain practical skills on preclinical testing procedures of drugs and recent experimental techniques in the drug discovery and development.

This subject also helps the students learn in-silico drug design, dose-response relationships of drugs, international guidelines for preclinical and clinical studies

Upon completion of this course, the student should be able to:
- CO 1: Demonstrate, analyze and compare dose-response relationship of drugs and quantification of responses of receptor ligands.
- CO 2: Understand and apply international guidelines to evaluate drug toxicities and its report.
- CO 3: Plan and design in-silico drug candidates for a target protein and critically analyze its druggability.

**PHA-MPL 206S: Seminar**

The subject is designed to create an environment where teachers provide the students with a critical eye and openness to fortify the presentation and academic writing skills of students in the field of Pharmacology.

Upon completion of the course, the student shall be able to:
- CO 1: Develop skills to gather, organize, deliver information, and defend a given topic in pharmacology
- CO 2: Learn to organize complex pharmacology concepts using audio-visual aids.
- CO 3: Acquire communication and presentation skills.
- CO 4: Effectively respond to the questions raised by peers and stand scientific scrutiny.
- CO 5: Develop a write-up on the subject of seminar presentation
- CO 6: Cultivate a sense of upgradation of knowledge through self and continuous learning
**PHA-MRM301T : Research Methodology and Biostatistics**

This subject is designed to understand the advanced knowledge for research methodology, ethics in research, medical research, design, conduct and interpretation of results. This subject deals with principles of statistics and their applications in biostatistics involving parametric tests, non-parametric tests, correlation, regression, probability theory and statistical hypotheses.

Upon completion of the course, the student shall be able to

CO 1: Know the various components of research design and methodology.

CO 2: Appreciate advanced statistical techniques in solving the research problems.

**MJC 302P : Journal Club**

The subject is designed to create an environment where students present a published research paper, and critically analyze it, which would enhance the communication, presentation and analytical skills of the students.

Upon completion of the course, the student shall be able to:

CO 1: Learn to organize complex research concepts using audio-visual aids.

CO 2: Acquire communication and presentation skills.

CO 3: Effectively respond to the questions raised by peers and stand scientific scrutiny.

CO 4: Cultivate a sense of upgradation of knowledge through self and continuous learning.

**MRW 401P Research Work**

The course is designed for students to undertake an independent research problem under the supervision of a mentor in the field of Pharmacology.

Upon completion of this course, students shall be able to

CO 1: Demonstrate ability to collect, organize data to identify research gaps and to formulate research questions

CO 2: Develop designs to find solutions to the research questions

CO 3: Demonstrate capacity to lead and develop collaboration with others to solve research problems

CO 4: Demonstrate an understanding of the ethical issues associated with research

CO 5: Analyze data and synthesize research findings

CO 6: Report research findings in written and verbal forms

CO 7: Use research findings to advance education theory and practice.