



# VIKAS INSTITUTE OF PHARMACEUTICAL SCIENCES

Near Airport, Nidigatla Road, Rajahmundry - 533102

(Approved by AICTE & PCI, New Delhi Affiliated to Andhra University, Vizag)



**Course Name: M. Pharmacy**

**Duration: 2 years**

S.No.	Code	Program Outcomes
1	PO1	To ensure advanced learning of specializations like Drug design and synthesis, dosage form technology, analytical techniques, herbal and phytochemical screening techniques, quality assurance and regulatory concerns, scale up techniques, drug use and their outcomes etc.
2	PO2	To provide effective hands-on training of pharmaceutical equipment and instruments along with their calibration and validation.
3	PO3	To develop standard operating procedures for various instruments used in drug development and evaluation.
4	PO4	To impart practical knowledge by designing experiments and development of protocols for formulation development, analytical method development and screening.
5	PO5	To inculcate sound knowledge on research via conduction of journal clubs, seminars and research publications.



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## MASTER OF PHARMACY

### COURSE: PHARMACEUTICS (MPH)

#### SEMESTER -I

S.No.	Code	Subject	Course Outcomes
2	MPH 101T	MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES	<ol style="list-style-type: none"><li>1. This subject deals with various advanced analytical instrumental techniques for identification, characterization and quantification of drugs.</li><li>2. Instruments dealt are NMR, Mass spectrometer, IR, HPLC, GC etc.</li></ol>
2	MPH 102T	DRUG DELIVERY SYSTEMS	<ol style="list-style-type: none"><li>1. This course is designed to impart knowledge on the area of advances in novel drug delivery systems.</li></ol>
3	MPH 103T	MODERN PHARMACEUTICS	<ol style="list-style-type: none"><li>1. This Course designed to impart advanced knowledge and skills required to learn various aspects and concepts at pharmaceutical industries.</li></ol>
4	MPH 104T	REGULATORY AFFAIRS	<ol style="list-style-type: none"><li>1. Course designed to impart advanced knowledge and skills required to learn the concept of generic drug and their development, various regulatory filings in different countries, different phases of clinical trials and submitting regulatory documents.</li></ol>



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## SEMESTER -II

S.No.	Code	Subject	Course Outcomes
1	MPH 201T	MOLECULAR PHARMACEUTICS	1. This course is designed to impart knowledge on the area of advances in Nanotechnology and novel drug delivery systems.
2	MPH 202T	ADVANCED BIOPHARMACEUTICS & PHARMACOKINETICS	1. This course is designed to impart knowledge and skills necessary for dose calculations, dose adjustments and to apply biopharmaceutics theories in practical problem solving. 2. Basic theoretical discussions of the principles of biopharmaceutics and pharmacokinetics are provided to help the students to clarify the concepts.
3	MPH 203T	COMPUTER AIDED DRUG DEVELOPMENT	1. This course is designed to impart knowledge and skills necessary for computer Applications in pharmaceutical research and development who want to understand the application of computers across the entire drug research and development process. 2. Basic theoretical discussions of the principles of more integrated and coherent use of computerized information (informatics) in the drug development process are provided to help the students to clarify the concepts. 3. This Course designed to impart advanced knowledge and skills required to learn various aspects and concepts at pharmaceutical industries.
4	MPH 204T	COSMETICS & COSMECEUTICALS	1. This course is designed to impart knowledge and skills necessary for the fundamental need for cosmetic and cosmeceutical products.



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## SEMESTER -III

S.No.	Code	Subject	Course Outcomes
1	MPH 301T	RESEARCH METHODOLOGY AND BIOSTATISTICS	<ol style="list-style-type: none"><li>1. This Course designed to impart advanced knowledge and develop the ability to apply the methods while working on a research project work and describe the appropriate statistical methods required for a particular research design.</li><li>2. The subject also covers the how to choose appropriate research design and develop appropriate research hypothesis for a research project and also develop appropriate frame work for research studies.</li></ol>



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## COURSE: PHARMACEUTICAL ANALYSIS (MPA)

### SEMESTER - I

S.No.	Code	Subject	Course Outcomes
1	MPA 101T	MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES	1. 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.
2	MPA 102T	ADVANCED PHARMACEUTICAL ANALYSIS	1. This subject deals with the various aspects of Impurity, Impurities in new drug products, in residual solvents, Elemental impurities, Impurity profiling and characterization of degradants, Stability testing of phytopharmaceuticals and their protocol preparation. 2. It also covers the biological testing of various vaccines and their principle and procedure.
3	MPA 103T	PHARMACEUTICAL VALIDATION	1. The main purpose of the subject is to understand about validation and how it can be applied to industry and thus to improve the quality of the products. 2. The subject covers the complete information about validation, types, methodology and application.
4	MPA 104T	FOOD ANALYSIS	1. This course is designed to impart knowledge on analysis of food constituents and finished food products. 2. The course includes application of instrumental analysis in the determination of pesticides in variety of food products.



## SEMESTER -II

S.No.	Code	Subject	Course Outcomes
1	MPA 201T	ADVANCED INSTRUMENTAL ANALYSIS	1. This subject deals with various hyphenated analytical instrumental techniques for identification, characterization and quantification of drugs. Instruments dealt are LC-MS, GC-MS, and hyphenated techniques.
2	MPA 202T	MODERN BIO-ANALYTICAL TECHNIQUES	1. This subject is designed to provide detailed knowledge about the importance of analysis of drugs in biological matrices.
3	MPA 203T	QUALITY ASSUARANCE & QUALITY CONTROL	1. This course deals with the various aspects of quality control and quality assurance aspects of pharmaceutical industries. 2. It covers the important aspects like cGMP, QC tests, documentation, quality certifications, GLP and regulatory affairs.
4	MPA 204T	HERBAL COSMETIC ANALYSIS	1. This course is designed to impart knowledge on analysis of herbal products. 2. Regulatory requirements, herbal drug interaction with monographs. 3. Performance evaluation of cosmetic products is included for the better understanding of the equipment used in cosmetic industries for the purpose.



## SEMESTER -III

S.No.	Code	Subject	Course Outcomes
1	MPA 301T	RESEARCH METHODOLOGY AND BIOSTATISTICS	<ol style="list-style-type: none"><li>1. This Course designed to impart advanced knowledge and develop the ability to apply the methods while working on a research project work and describe the appropriate statistical methods required for a particular research design.</li><li>2. The subject also covers the how to choose appropriate research design and develop appropriate research hypothesis for a research project and also develop appropriate frame work for research studies.</li></ol>



## COURSE: REGULATORY AFFAIRS (MRA)

### SEMESTER - I

S.No.	Code	Subject	Course Outcomes
1	MRA 101T	GOOD REGULATORY PRACTICES	<ol style="list-style-type: none"><li>1. This course is designed to impart fundamental knowledge on various Good Regulatory Practices viz., cGMP, GLP, GALP and GDP for Pharmaceuticals, Cosmetics, Food &amp; Nutraceuticals, Medical devices.</li><li>2. In-vitro Diagnostic Medical Devices (IVDs) and biological products and understand the rationale behind these requirements and will propose ways and means of complying with them.</li></ol>
2	MRA 102T	DOCUMENTATION AND REGULATORY WRITING	<ol style="list-style-type: none"><li>1. This course is designed to impart fundamental knowledge on documentation and general principles involved in regulatory writing and submission to agencies.</li></ol>
3	MRA 103T	CLINICAL RESEARCH REGULATIONS	<ol style="list-style-type: none"><li>1. This course is designed to impart the fundamental knowledge on the clinical development process of drugs, pharmaceuticals and Medical Devices, phases and conduct of clinical trials and research, regulations and guidance governing the conduct of clinical research in India, USA and EU.</li><li>2. It prepares the students to learn in detail on various laws, legislations and guidance related to safety, efficacy, ethical conduct and regulatory approval of clinical research.</li></ol>
4	MRA 104T	REGULATIONS AND LEGISLATION FOR DRUGS & COSMETICS, MEDICAL DEVICES, BIOLOGICALS & HERBALS, AND FOOD & NEUTRACEUTICALS IN INDIA AND INTELLECTUAL PROPERTY RIGHTS	<ol style="list-style-type: none"><li>1. This course is designed to impart fundamental knowledge on regulations and legislation in India w.r.t. Drugs &amp; Cosmetics, Medical Devices, Biologicals &amp; Herbals, and Food &amp; Nutraceuticals.</li><li>2. It prepares the students for basic regulatory requirements in India of Drugs &amp; Cosmetics, Medical Devices, Biologicals &amp; Herbals, and Food &amp; Nutraceuticals. For manufacture, import &amp; registration, export, sale, marketing authorization, clinical trials and intellectual property rights.</li></ol>



## SEMESTER -II

S.No.	Code	Subject	Course Outcomes
1	MRA 201T	REGULATORY ASPECTS OF DRUGS & COSMETICS	<ol style="list-style-type: none"><li>1. This course is designed to impart the fundamental knowledge on the drug development process, regulatory requirements for approval of new drugs, drug products and cosmetics in regulated and semi-regulated countries.</li><li>2. It prepares the students to learn in detail on the regulatory requirements, documentation requirements, and registration procedures for marketing the drug products and cosmetics in regulated and semi-regulated countries.</li></ol>
2	MRA 202T	REGULATORY ASPECTS OF HERBAL & BIOLOGICALS	<ol style="list-style-type: none"><li>1. This course is designed to impart fundamental knowledge on Regulatory Requirements, Licensing and Registration, Regulation on Labelling of Biologics in India, USA and Europe.</li><li>2. It prepares the students to learn in detail on Regulatory Requirements for biologics, Vaccines and Blood Products</li></ol>
3	MRA 203T	REGULATORY ASPECTS OF MEDICAL DEVICES	<ol style="list-style-type: none"><li>1. This course is designed to impart the fundamental knowledge on the medical devices and in vitro diagnostics, basis of classification and product life cycle of medical devices, regulatory requirements for approval of medical devices in regulated countries like US, EU and Asian countries along with WHO regulations.</li><li>2. It prepares the students to learn in detail on the harmonization initiatives, quality and ethical considerations, regulatory and documentation requirements for marketing medical devices and IUDs in regulated countries.</li></ol>
4	MRA 204T	REGULATORY ASPECTS OF FOOD & NUTRACEUTICALS	<ol style="list-style-type: none"><li>1. This course is designed to impart the fundamental knowledge on Regulatory Requirements, Registration and Labeling Regulations of Nutraceuticals in India, USA and Europe.</li><li>2. It prepares the students to learn in detail on Regulatory Aspects for nutraceuticals and food supplements.</li></ol>



## SEMESTER - III

S.No.	Code	Subject	Course Outcomes
1	MRA 301T	RESEARCH METHODOLOGY AND BIostatISTICS	<ol style="list-style-type: none"><li>1. This Course designed to impart advanced knowledge and develop the ability to apply the methods while working on a research project work and describe the appropriate statistical methods required for a particular research design.</li><li>2. The subject also covers the how to choose appropriate research design and develop appropriate research hypothesis for a research project and also develop appropriate frame work for research studies.</li></ol>



## COURSE: INDUSTRIAL PHARMACY (MIP)

### SEMESTER -I

S.No.	Code	Subject	Course Outcomes
1	MIP 101T	MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES	1. 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.
2	MIP 102T	PHARMACEUTICAL FORMULATION DEVELOPMENT	1. This Course designed to impart advanced knowledge and skills required to learn various aspects and concepts at pharmaceutical industries.
3	MIP 103T	NOVEL DRUG DELIVERY SYSTEMS	1. This course is designed to impart knowledge on the area of advances in novel drug delivery systems.
4	MIP 104T	INTELLECTUAL PROPERTY RIGHT	1. This Course designed to impart advanced knowledge and skills required to learn the concept of generic drug and their development, various regulatory filings in different countries, different phases of clinical trials and submitting regulatory documents.



## SEMESTER -II

S.No.	Code	Subject	Course Outcomes
1	MIP 201T	ADVANCED BIOPHARMACEUTICS & PHARMACOKINETICS	1. This Subject deals with dose calculations, dose adjustments and to apply Biopharmaceutics theories in practical problem solving.
2	MIP 202T	SCALE UP AND TECHNOLOGY TRANSFER	1. This course is designed to impart knowledge and skills necessary to train the students to be on scale up, technology transfer process and industrial safety issues. 2. Manage the scale up process in pharmaceutical industry and assist in technology transfer, to establish safety guidelines, which prevent industrial hazards.
3	MIP 203T	PHARMACEUTICAL PRODUCTION TECHNOLOGY	1. This course is designed to impart knowledge and skills necessary to train the students to be on par with the routine of industrial activities in production, handle the scheduled activities in a pharmaceutical firm and manage the production of large batches of pharmaceutical formulations.
4	MIP 204T	ENTREPRENEURSHIP MANAGEMENT	1. This course is designed to impart knowledge and skills necessary to train the students on entrepreneurship management. 2. The Role of enterprise in national and global economy, Dynamics of motivation and concepts of entrepreneurship, Demands and challenges of Growth Strategies and Networking.



## SEMESTER - III

S.No.	Code	Subject	Course Outcomes
1	MIP 301T	RESEARCH METHODOLOGY AND BIOSTATISTICS	<ol style="list-style-type: none"><li>1. This Course designed to impart advanced knowledge and develop the ability to apply the methods while working on a research project work and describe the appropriate statistical methods required for a particular research design.</li><li>2. The subject also covers the how to choose appropriate research design and develop appropriate research hypothesis for a research project and also develop appropriate frame work for research studies.</li></ol>