Alard Charitable Trust's
ALARD COLLEGE OF PHARMACY
Sr.No 50, Near Rajiv Gandhi Infotech Park,
Marunji, Pune 411057

M.Pharmacy First Year DEPARTMENT OF PHARMACEUTICS

Sem I

MPAT101T: MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Upon completion of the course, student shall be able

CO1	Describe the principles, instrumentation of Spectroscopy
CO2	Explain theoretically and practically principle, instrumentation, chromatographic parameters, factors affecting resolution and applications of chromatography.
CO3	Describe principles, instrumentation, applications of electrophoresis techniques.
CO4	Know about different methods and techniques of X-ray diffraction and its application.
CO5	Explain principles, instrumentation, advantages and disadvantages and applications of various thermal techniques.

MPH 102T: DRUG DELIVERY SYSTEMS

Upon completion of the course, student shall be able

CO1	Explain the various approaches for development of novel drug delivery Systems.
CO2	Enumerate the application of Dosage Forms for Personalized Medicine, Pharmacogenetics, Customized drug delivery systems, Bioelectronic Medicines, 3D printing of pharmaceuticals, and Telepharmacy.
CO3	Identify the criteria for selection of drugs and polymers for the development of delivering system.
CO4	Discuss the formulation and evaluation of Novel drug delivery systems

MPH 103T: MODERN PHARMACEUTICS

Upon completion of the course, student shall be able

CO1	Explain the elements of Preformulation studies of different dosage form
CO2	Discuss physics of tablets and its effect on pharmacokinetic parameters.
CO3	Explain the Industrial Management and GMP Considerations concepts in pharmaceutical industries

CO4	Outline the Optimization Techniques & Pilot Plant Scale Up Techniques in pharmaceutical industries.
CO5	Apply the knowledge of Stability Testing, sterilization process & packaging of dosage forms in pharmaceutical industries.

MPH 104T: REGULATORY AFFAIRS

Upon the completion of the course student shall be able to

CO1	Discuss the Concepts of innovator and generic drugs, drug development Process.
CO2	Explain the Regulatory guidance and guidelines for filing and approval Process including Post approval regulatory requirements for actives and drug products.
CO3	Explain preparation of Dossiers and their submission e-formats to regulatory agencies across the globe.
CO4	Outline Clinical trials requirements for approvals for conducting clinical trials.
CO5	Relate Pharmacovigilance and process of monitoring in clinical trials.

MPH 105P: PHARMACEUTICS PRACTICALS - I

Upon the completion of the course student shall be able to

CO1	Estimate pharmacopeial compounds and their formulations by UV Visible spectrophotometer, HPLC, Gas Chromatography, flame photometry, fluorimetry
CO2	Perform In –vitro dissolution of novel drug delivery systems like controlled release or sustained release marketed formulation.
CO3	Formulate and evaluate novel drug delivery systems like sustained release matrix tablets, Mucoadhesive tablets and Trans dermal patches
CO4	Perform the Preformulation studies of tablet dosage form.
CO5	Determine the effect of process variables and excipients on tablet dosage form

Sem-II

MPH 201T: MOLECULAR PHARMACEUTICS (NANO TECHNOLOGY & TARGETED DDS) (NTDS)

Upon completion of the course student shall be able to understand

CO1	Explain the various approaches for development of novel drug delivery Systems.
CO2	Identify the criteria for selection of drugs for the development of delivering system.
CO3	Identify the criteria for selection of Polymer for the development of delivering system.
CO4	Discuss the formulation and evaluation of Novel drug delivery

	systems

MPH 202T: ADVANCED BIOPHARMACEUTICS & PHARMACOKINETICS

Upon completion of this course it is expected that students will be able to understand,

CO1	Explain the basic concepts in biopharmaceutics and pharmacokinetics.
CO2	Make use of raw data to derive the pharmacokinetic models and parameters the best describe the process of drug Absorption, Distribution, Metabolism and Elimination.
CO3	Outline critical evaluation of biopharmaceutics studies involving drug Product equivalency.
CO4	Design and evaluate the dosage regimens of the drugs using pharmacokinetic and biopharmaceutics parameters.
CO5	Discuss the potential clinical pharmacokinetic problems and application of basics of pharmacokinetic.

MPH 203T: COMPUTER AIDED DRUG DEVELOPMENT

At the end of the course, the students will be able to

CO1	Describe history and role of computers in Pharmaceutical research and preclinical development.
CO2	Explain drug disposition modeling techniques
CO3	Express the importance of computer in market analysis, biopharmaceutical characterization, Pharmacokinetic and dynamics and clinical development.
CO4	Describe pharmaceutical application, advantages, disadvantages, current challenges and future scope of artificial intelligence and robotics.
CO5	Describe pharmaceutical application, advantages, disadvantages, current challenges and future scope of computational fluid dynamics.

MPH 204T: COSMETICS AND COSMECEUTICALS

Upon the completion of the course student shall be able to

CO1	Utilize knowledge of regulatory aspects and biological aspects as a fundamental need for development of cosmetics and cosmeceuticals .
CO2	Explain the formulation building blocks for different product formulations of cosmetics and cosmeceuticals.
CO3	Discuss the current technologies in the market.
CO4	Make use of Scientific knowledge to develop cosmetics and cosmeceuticals with desired safety, stability and efficacy.

MPH 205P: PHARMACEUTICS PRACTICALS - II

Upon the completion of the course student shall be able to

CO1	Formulate and evaluate various Novel drug delivery system like Alginate beads, gelatin or albumin microsphere ,Spherules, Liposomes or Niosomes,
CO2	Apply the dissolution studies in comparing the marketed products and solubility studies
CO3	Perform the computational modeling using various software and analyze the data accordingly.
CO4	Perform the In vitro In vivo studies related to ADME
CO5	Develop and evaluate different dosage form.

CONSTITUTION OF INDIA (THEORY)

Upon the completion of the course student shall be able to

CO1	Describe the philosophy of Indian Constitution.
CO2	Describe the importance and limits of Fundamental rights.
CO3	Describe the Directive principles of State policy.
CO4	Explain the Fundamental duties and its importance.

DEPARTMENT OF QUALITY ASSURANCE

Sem-I

MPAT101T: MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Upon the completion of the course student shall be able to

CO1	Describe the principles, instrumentation of Spectroscopy.
CO2	Explain theoretically and practically principle, instrumentation, chromatographic parameters, factors affecting resolution and applications of chromatography.
CO3	Describe principles, instrumentation, applications of electrophoresis techniques.
CO4	Know about different methods and techniques of X-ray diffraction and its application.
CO5	Explain principles, instrumentation, advantages and disadvantages and applications of various thermal techniques.

MQA 102T: QUALITY MANAGEMENT SYSTEM

Upon completion of the course student shall be able to

CO1	Discuss the importance of Quality, tools to improve the quality and analyze the issues in Quality.
CO2	Discuss the Total Quality Management, Quality systems.
CO3	Describe the Drug Stability and Risk Management Guidelines.
CO4	Design the Statistical approaches and benchmarking for quality.

MQA 103T: QUALITY CONTROL AND QUALITY ASSURANCE

Upon completion of the course student shall be able to

CO1	Describe the cGMP, GLP aspects in pharmaceutical industry.
CO2	Explain manufacturing operations and controls in pharmaceutical industries.
CO3	Explain the different types of documentation and its importance in pharmaceutical industry.
CO4	Express the role of QA and QC department.

MQA 104T: PRODUCT DEVELOPMENT AND TECHNOLOGY TRANSFER

Upon completion of the course student shall be able to

CO1	Describe the new product development process.
CO2	Design the pilot plant study protocols.
CO3	Explain Preformulation studies parameters, methods to improve solubility.
CO4	Elucidate information to transfer technology of current products between various manufacturing places.

MQA 105P: QUALITY ASSURANCE PRACTICAL

Upon completion of the course student shall be able to

CO1	Handle sophisticated instruments like UV - Visible spectrophotometer, Flame photometer, Fluorimeter and HPLC.
CO2	Perform pre formulation studies, IPQC and finished product quality control test for tablets, capsules, parenterals, semisolid dosage form and packaging materials.
CO3	Describe and apply quality management systems like six sigma, out of Specification, out of trend, corrective and preventive action and deviations.

Sem-II

MQA 201T: HAZARDS AND SAFETY MANAGEMENT

Upon the completion of the course student shall be able to

CO1	Understand the environment and its allied problems.
CO2	Define and execute the compliance of safety standards and safety management in industry.
CO3	Design Novel concepts for management of Hazard Management System as per industry standards and requirements.
CO4	Describe the methods of hazard assessment, procedures and methodology to create awareness amongst people and workers in industry.

MQA 202T: PHARMACEUTICAL VALIDATION

Upon the completion of the course student shall be able to

CO1	Understand and apply the concepts of calibration, qualification and validation of Analytical methods.
CO2	Perform the qualification of various equipments and instruments.
CO3	Design the SOP's and Perform the Process validation of different dosage forms.
CO4	Understand and perform the Validation of analytical method for estimation of drugs.
CO5	Describe and perform the Cleaning validation of equipments employed in the manufacture of pharmaceuticals.

MQA203T: AUDITS AND REGULATORY COMPLIANCE

At the end of the course, the students will be able to

CO1	Describe the importance of auditing
CO2	Explain the different methods of auditing.
CO3	Efficiently carry out audit process and prepare audit report.
CO4	Prepare audit checklist.

MQA 204T: PHARMACEUTICAL MANUFACTURING TECHNOLOGY

Upon the completion of the course student shall be able to

CO1	Understand the Regulatory and legal aspects required to set up a pharmaceutical industry.
CO2	Understand and apply the principles and practices of Aseptic Process Technology, Non-sterile Manufacturing Technology and Packaging Technology.
CO3	Understand and apply the novel concepts of QbD and PAT in the design of experiments in Formulation development and Analytical method development.
CO4	Remain up-to-date about the FDA initiatives on PAT and QbD.

MQA 205P: QUALITY ASSURANCE PRACTICAL

Upon the completion of the course student shall be able to

CO1	Understand and apply different analytical methods for estimation of residue, impurities and contaminants in Drug Products and Environment.
CO2	Perform the Qualification of manufacturing equipment used in industry.
CO3	Perform validation of Analytical methods for Drugs, Processing Area and Equipment.
CO4	Preparation and Documentation of checklists required during Manufacturing of various dosage forms and their manufacturing area.

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CO4	Explain the Fundamental duties and its importance.