



## DCOP

### Subjectwise Course Outcome - [Pharmaceutical Quality Assurance - 2021-22]

First Semester	
<b>Modern Pharmaceutical Analytical Techniques [ Theory   Regular ]</b>	
CO ID.	Course Outcome
MQA101T.1	CO.1.Remember and understand the electromagnetic spectrum, spectroscopy and its importance in Pharmaceutical analysis.
MQA101T.2	CO.2.Describe the instrumentation of various spectro-analytical techniques.
MQA101T.3	CO.3 Explain the applications of different spectro-analytical techniques for the qualitative and quantitative analysis.
MQA101T.4	CO.4.To understand the principles involved in various chromatography techniques such as paper,TLC,ion exchange,HPLC,and HPTLC etc
MQA101T.5	CO.5.To know the basic construction and working of chromatographic techniques
<b>Product Development &amp; Technology Transfer [ Theory   Regular ]</b>	
CO ID.	Course Outcome
MQA104T.1	CO1. To understand product development process in pharmaceutical industry.
MQA104T.2	CO2. To explain and perform pre formulation studies of compounds.
MQA104T.3	CO3.To describe pilot plant for liquid semi solid and solid dosage form.
MQA104T.4	CO4. To understand technology transfer and pharmaceutical packaging of different dosage form.
<b>Computer Application [ Theory   Regular ]</b>	
CO ID.	Course Outcome
Co1	Know the various types of application of computers in pharmacy
Co2	Know the various types of databases
Co3	Know the various applications of databases in pharmacy
<b>Communication Skill [ Theory   Elective ]</b>	
CO ID.	Course Outcome
CO1	To explain the key terminologies of process of communication
CO2	communicate effectively by emphasizing on practical communication through refurbishing their existing language skills and also to bring one and all to a common take-off level.
CO3	To develop good presentation skills by learning the essential steps for its planning and preparation, and effective use of verbal & non-verbal communication for delivering a business presentation.
CO4	To develop academic writing skills.
CO5	To enhance employability skills of the learners by enabling them to write effective resume and face the interview with confidence.
CO6	To develop competencies to form written communication strategies necessary in the workplace, and to execute them for effective communication.
<b>Pharmaceutical Quality Assurance-I [ Practical   Regular ]</b>	
CO ID.	Course Outcome
CO1	Students must get practical knowledge of modern analytical instruments that are used for drug testing.
CO2	Students must be able to handle various spectroscopic instruments like Uv-Visible spectrophotometer, Colorimeter, Fluorimeter, IR, Flame photometer and Nepheloturbidometer.
CO3	Students must be well versed in chromatographic techniques like, HPLC, Gc, Column chromatography, paper and Thin layer chromatography etc.
CO4	Students must study different case studies on Total Quality management, Six sigma, Out of specification (OOS) and Corrective and preventive action (CAPA).
<b>MQA 102T Quality management System [ Theory   Regular ]</b>	

CO ID.	Course Outcome
CO1	The importance of quality and Quality Management System.
CO2	ISO management systems, Identify requirements of quality improvement programs.
CO3	Tools for quality improvement. To realize the importance of significance of quality.
CO4	Analysis of issues in quality. Manage quality improvement teams
CO5	Quality evaluation of pharmaceuticals. Customer Satisfaction, Employee Involvement, Continuous Process Improvement, Supplier Partnership, Performance Measures.
CO6	Stability testing of drug product and drug substances.
CO7	Statistical approaches for quality. Bench marking, Quality Function Deployment.

#### MQA103T Quality Control and quality Assurance [ Theory | Regular ]

CO ID.	Course Outcome
CO1	Students should understand the cGMP principles in pharmaceutical industry, GLP, ICH guidelines and CPCSCA guidelines.
CO2	Students should learn about Schedule M, Pharmaceutical inspection convention (PIC), EMEA, WHO and Good warehousing practices.
CO3	Students should acquire knowledge of Analysis of raw materials, finished products, packaging materials, in process quality control (IPQC).
CO4	Students should learn basic principles, maintenance, retention and retrieval of documentation.
CO5	Students should understand manufacturing processes and control measures in pharmaceutical industry.

#### Second Semester

#### Pharmaceutical Validation [ Theory | Regular ]

CO ID.	Course Outcome
CO1	To understand the concept of calibration, qualification & validation.
CO 2	To know the qualification of various equipment's & utility systems
CO 3	To understand the process validation & cleaning validation
CO 4	To understand the principles & roles of intellectual property rights.

#### Pharmaceutical manufacturing technology [ Theory | Regular ]

CO ID.	Course Outcome
MQA204T.1	CO1. Acquire knowledge about common practice in pharmaceutical industry development, Plant layout ,production planning and legal regulatory aspect require to setup a pharmaceutical industry.
MQA204T.2	CO2. Know about the important of principle and practices of aseptic technology, packaging technology and manufacturing technology.
MQA204T.3	CO3. To apply knowledge gain to identify problem and measures to assure quality and stability of pharmaceuticals.
MQA204T.4	CO4. To apply and implement modern tool in pharmaceutical manufacturing remain up to date about FDA initiatives on PAT and QbD.

#### Literature review & preclinical studies [ Theory | Regular ]

CO ID.	Course Outcome
CO1	To know various parts of review and research paper, Abstract, Introduction, Keywords, graphical abstract , material and methods, result and discussion, figures, tables, summary or conclusion, conflict of interest, reference writing.
CO2	To know Types of journals and journal finding, role of impact factor in selecting journal, role of language and effective writing on the article selection
CO3	To know Various tools used in the writing of research or review articles: use of MS words, PubMed, Mendley software, google search, google scholar
CO4	To know the detailed preclinical studies

#### Structural elucidation [ Theory | Elective ]

CO ID.	Course Outcome
SET.1	CO1 To study of range of EMR and their parameter, Wavelength, frequency, velocity, different types of electronics transition and Woodward fisher rule for conjugated compounds.
SET.2	CO.2 To understand problems based on joint applications of UV, IR, 1H NMR, 13C NMR and Mass spectroscopy

#### Pharmaceutical Quality assurance-II [ Practical | Regular ]

CO ID.	Course Outcome
CO1	Students must be able to handle various spectroscopic instruments like Uv-Visible spectrophotometer, Colorimeter, Fluorimeter, IR, Flame photometer and Nepheloturbidometer.
CO2	Students must be well versed in chromatographic techniques like, HPLC, Gc, Column chromatography, paper and Thin layer chromatography etc.
CO3	Student must understand qualification of pharma equipments like Autoclave, Hot air oven, Powder mixer, dissolution apparatus, Friability apparatus etc.
CO4	Students must be able to prepare checklists for tablet production, sterile production area, water for injection, bulk vendors etc.

**MPA 203T Audit & Regulatory compliance [ Theory | Regular ]**

CO ID.	Course Outcome
CO1	Discuss briefly about audit objectives and their management
CO2	Understand the role of quality systems and audits in pharmaceutical manufacturing environment
CO3	Frame a checklist for auditing pharmaceutical industries
CO4	Learn the requirements for auditing vendors supplying various materials and equipments
CO5	Understand the auditing of a microbiological laboratory
CO6	Learn the auditing of quality assurance systems
CO7	Understand the basics of auditing various engineering systems in a manufacturing plant
CO8	Learn about audit report and classification of deficiencies

**MQA201T Hazards and safety management [ Theory | Regular ]**

CO ID.	Course Outcome
CO1	Students shall be able to understand about environmental problems and impart basic knowledge about environment and its allied problems.
CO2	Students must develop an attitude of concern for the industry environment and must ensure safety standards in pharmaceutical industry.
CO3	Students must get comprehensive knowledge on the safety management.
CO4	Students must empower an idea to clear mechanism and management in different in different kinds of hazards management system.
CO5	students must learn the method of Hazard assessment, procedure, methodology to provide safe industrial atmosphere.