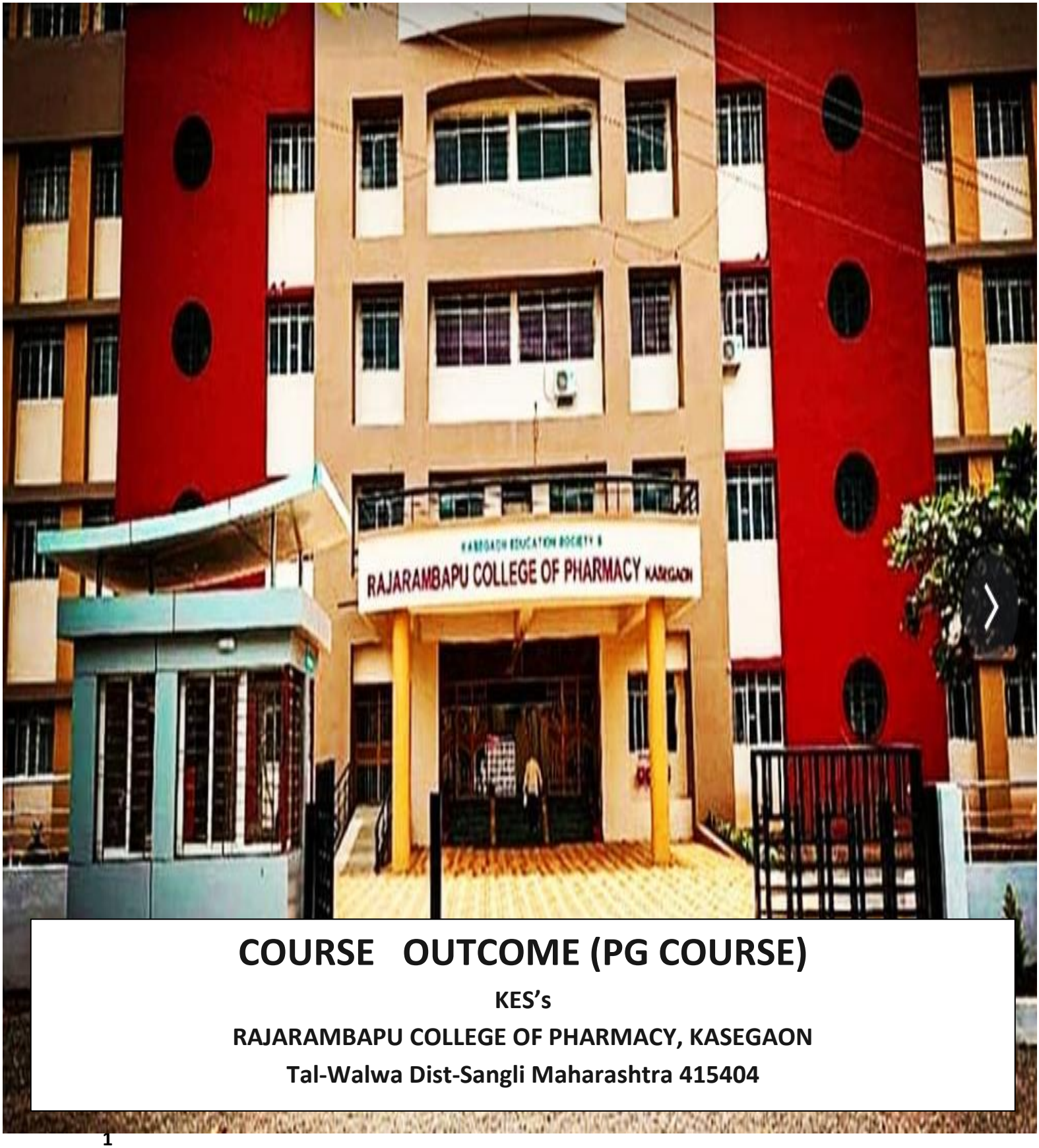

COURSE OUTCOME (PG COURSE)

KES's

RAJARAMBAPU COLLEGE OF PHARMACY, KASEGAON

Tal-Walwa Dist-Sangli Maharashtra 415404

COURSE OUTCOME BOOKLET

M.PHARMACY (PHARMACEUTICS)

SEMESTER I

MPH101. MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES:

Subject- MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MPH101.1	Understand and explain the basic Principles & theory of different spectroscopy, chromatography, electrophoresis, x-ray crystallography and immunoassays.
MPH101.2	Outline, Discuss and justify instrumentation of different spectroscopy, chromatography, electrophoresis, x-ray crystallography and immunoassays.
MPH101.3	Describe and analyse the applications of different spectroscopy, chromatography, electrophoresis, x-ray crystallography and immunoassays.

MPH102. DRUG DELIVERY SYSTEM

Subject- DRUG DELIVERY SYSTEM (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MPH102.1	Explain design, characterization and study of sustained and controlled release drug delivery systems
MPH102.2	Explore the classification and applications of polymers in formulation of controlled release drug delivery systems
MPH102.3	Know principles and fundamentals involved in rate controlled drug delivery systems and gastro-retentive drug delivery systems
MPH102.4	Barriers of drug permeation for ocular drug delivery systems and protein and peptide delivery
MPH102.5	Comprehend formulation and evaluation of transdermal drug delivery system

MPH103. MODERN PHARMACEUTICS

Subject- MODERN PHARMACEUTICS (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MPH103.1	Explain the elements of Preformulation study.
MPH103.2	Describe optimization techniques in pharmaceutical formulation
MPH103.3	Discuss pharmaceutical validation, its types and scope.
MPH103.4	Summarize industrial management and GMP consideration.
MPH103.5	Elaborate the compression, compaction and study of consolidated parameters.

MPH104. REGULATORY AFFAIR

Subject- REGULATORY AFFAIR (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MPH104.1	Describe the concept of innovator and generic drugs, drug development process
MPH104.2	Assess the regulatory guidance's and guidelines for filing and approval process
MPH104.3	Assess the preparation of dossiers and their submission to regulatory agencies in different countries
MPH104.4	Categorize the post approval requirements for actives and drug products
MPH104.5	Discuss the concept of non-clinical drug development, role of pharmacovigilance and the process of monitoring in clinical trials

MPH105. PHARMACEUTICS PRACTICAL I

Subject- PHARMACEUTICS PRACTICAL I (Practical)

Sr. no	On completion of the course the students shall able to (Statement)
MPH105.1	Evaluate therapeutic agents by various instrumental analytical techniques
MPH105.2	Perform Preformulation studies for development of various dosage forms
MPH105.3	Design and optimize various types of controlled oral, transdermal and mucosal drug delivery systems
MPH105.4	Evaluate various developed drug delivery systems using suitable methods
MPH105.5	Predict pharmaceutical factors affecting drug release kinetics

SEMESTER II

MPH201. MOLECULAR PHARMACEUTICS (NANO TECH AND TARGETED DDS)

Subject- MOLECULAR PHARMACEUTICS (NANO TECH AND TARGETED DDS) (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MPH201.1	Explain biological process involved in drug targeting.
MPH201.2	Explain the drug targeting methods
MPH201.3	Understand formulation approaches and evaluation of microcapsules / Micro Spheres
MPH201.4	Discuss pulmonary drug delivery systems and preparation and evaluation methods thereof.
MPH201.5	Discuss nucleic acid based therapeutic delivery system including gene therapy.

MPH202. ADVANCED BIOPHARMACEUTICS & PHARMACOKINETICS

Subject- ADVANCED BIOPHARMACEUTICS & PHARMACOKINETICS (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MPH202.1	Discuss the basic concepts in biopharmaceutics and pharmacokinetics
MPH202.2	Understand derivation of the pharmacokinetic models and parameters that best describe the process of drug absorption, distribution, metabolism and elimination.
MPH202.3	Discuss the critical evaluation of biopharmaceutical studies involving drug product equivalency.
MPH202.4	Describe the design and evaluation of dosage regimens of the drugs using Pharmacokinetics and biopharmaceutical parameters.
MPH202.5	Understand the potential clinical pharmacokinetic problems and application of basics of pharmacokinetics.

MPH203. COMPUTER AIDED DRUG DELIVERY SYSTEM

Subject- COMPUTER AIDED DRUG DELIVERY SYSTEM (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MPH203.1	Discuss the History of Computers in Pharmaceutical Research and Development
MPH203.2	Understand the role of computers in Preclinical Development, Clinical development and market analysis.
MPH203.3	Learn the concept of Computational fluid dynamics (CFD), Artificial Intelligence (AI) and Robotics
MPH203.4	Describe the Computational Modeling of Drug Disposition
MPH203.5	Understand in Optimization Techniques in Pharmaceutical Formulation

MPH204. COSMETIC AND COSMECEUTICALS

Subject- COSMETIC AND COSMECEUTICALS (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MPH204.1	Describe the regulatory provisions related to the import and manufacture of cosmetics as per the Drugs and Cosmetics Act 1940 and the Rules 1945
MPH204.2	Select key ingredients suitable in the formulation of various cosmetics and Explain the various problems related to the skin and hair.
MPH204.3	Design cosmetics that take care of cleansing needs of the face, eye lids, lips, hands, feet, nail, scalp, neck, body and under-arm.
MPH204.4	Design cosmeceuticals for sun protection, dry skin, acne, sun-protection, pigmentation, prickly heat, wrinkles, and body odor. Dandruff, dental cavities, bleeding gums, mouth odor and sensitive teeth.
MPH204.5	Describe the guidelines for the regulation of herbal cosmetics by private bodies and Select herbal ingredients in the formulation of cosmetics

MPH205. PHARMACEUTICS PRACTICAL II

Subject- PHARMACEUTICS PRACTICAL II (Practical)

Sr. no	On completion of the course the students shall able to (Statement)
MPH205.1	Compare the dissolution efficiency of various marketed pharmaceutical products
MPH205.2	Formulate and evaluate various cosmetic products
MPH205.3	Design experiments based on QbD for optimization of drug delivery
MPH205.4	Analyze and predict pharmacokinetic parameters using softwares
MPH205.5	Evaluate computational modelling of drug disposition

M.PHARMACY PHARMACEUTICAL CHEMISTRY

SEMESTER I

MPC101. MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES:

Subject- MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MPC101.1	Understand and explain the basic Principles & theory of different spectroscopy, chromatography, electrophoresis, x-ray crystallography, potentiometry & thermal techniques.
MPC101.2	Outline, Discuss and justify instrumentation of different spectroscopy, chromatography, electrophoresis, x-ray crystallography, potentiometry & thermal techniques.
MPC101.3	Describe and analyse the applications of different spectroscopy, chromatography, electrophoresis, x-ray crystallography, potentiometry & thermal techniques.

MPC102. ADVANCED ORGANIC CHEMISTRY – I

Subject- ADVANCED ORGANIC CHEMISTRY – I (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MPC102.1	The principles and applications of retero synthesis.
MPC102.2	The mechanism & applications of various named reactions.
MPC102.3	The concept of disconnection to develop synthetic routes for small target molecule.
MPC102.4	The various catalysts used in organic reactions & the chemistry of heterocyclic compounds

MPC103. ADVANCED MEDICINAL CHEMISTRY

Subject- ADVANCED MEDICINAL CHEMISTRY (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MPC103.1	Different stages & techniques of drug discovery & Role of medicinal chemistry in drug research
MPC103.2	Various strategies to design and develop new drug like molecules for biological targets & Peptidomimetics

MPC104. CHEMISTRY OF NATURAL PRODUCTS

Subject- CHEMISTRY OF NATURAL PRODUCTS (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MPC104.1	Different types of natural compounds and their chemistry and medicinal importance
MPC104.2	The importance of natural compounds as lead molecules for new drug discovery
MPC104.3	The concept of rDNA technology tool for new drug discovery
MPC104.4	General methods of structural elucidation of compounds of natural origin
MPC104.5	Isolation, purification and characterization of simple chemical constituents from natural source

MPC105. PHARMACEUTICAL CHEMISTRY PRACTICAL

Subject- PHARMACEUTICAL CHEMISTRY PRACTICAL (Practical)

Sr. no	On completion of the course the students shall able to (Statement)
MPC105.1	Analysis of Pharmacopoeial compounds and their formulations by various spectro chromatographic techniques.
MPC105.2	Simultaneous estimation of multi component containing formulations by UV spectrophotometry
MPC105.3	Perform synthetic compounds by using known reaction mechanism with purification and Characterization using TLC, melting point and IR spectroscopy.
MPC105.4	Technique for identification of isolated compounds and interpretation of UV and IR data.

SEMESTER II

MPC201. ADVANCED SPECTRAL ANALYSIS

Subject- ADVANCED SPECTRAL ANALYSIS (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MPC201.1	Explain fundamental concept of Computer aided drug design in new drug discovery.
MPC201.2	Categorize & describe various Computer aided drug design techniques & their applications.
MPC201.3	Explain principle & applications various strategies to design and develop new drug like molecules along with in silico virtual screening protocols.

MPC202. ADVANCED ORGANIC CHEMISTRY – II

Subject- ADVANCED ORGANIC CHEMISTRY – II (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MPC202.1	The principles and applications of green chemistry & the concept of peptide chemistry.
MPC202.2	The various catalysts used in organic reactions & the concept of stereochemistry and asymmetric synthesis.

MPC203. COMPUTER AIDED DRUG DESIGN

Subject- COMPUTER AIDED DRUG DESIGN (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MPC203.1	Describe basic principles, instrumentation and applications of spectroscopical techniques, thermal techniques, immunoassays.
MPC203.2	Apply spectroscopical data for interpretation of structure.
MPC203.3	Describe basic principles, instrumentation and applications of chromatography.

MPC204. PHARMACEUTICAL PROCESS CHEMISTRY

Subject- PHARMACEUTICAL PROCESS CHEMISTRY (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MPC204.1	The strategies of scale up process of APIs and intermediates
MPC204.2	The various unit operations and various reactions in process chemistry

MPC205. PHARMACEUTICAL CHEMISTRY PRACTICALS – II

Subject- PHARMACEUTICAL CHEMISTRY PRACTICALS – II (PRACTICALS)

Sr. no	On completion of the course the students shall able to (Statement)
MPC205.1	Synthesis of organic compounds by adapting different approaches like Oxidation, Reduction/hydrogenation & Nitration.
MPC205.2	Comparison of absorption spectra by UV and Wood ward – Fieser rule & Interpretation of organic compounds by FT-IR, NMR & MS
MPC205.3	Calculation of ADMET properties of drug molecules and its analysis using softwares Pharmacophore modelling like 2D-QSAR, 3D-QSAR & Docking study.

M.PHARMACY PHARMACEUTICAL QUALITY ASSURANCE

SEMESTER I

MQA101. MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Subject- MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MQA101.1	Understand and explain the basic Principles & theory of different spectroscopy, chromatography, electrophoresis, x-ray crystallography, potentiometry & thermal techniques.
MQA101.2	Outline, Discuss and justify instrumentation of different spectroscopy, chromatography, electrophoresis, x-ray crystallography, potentiometry & thermal techniques.
MQA101.3	Describe and analyse the applications of different spectroscopy, chromatography, electrophoresis, x-ray crystallography, potentiometry & thermal techniques

MQA102. QUALITY MANAGEMENT SYSTEM

Subject- QUALITY MANAGEMENT SYSTEM (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MQA102.1	To understand the basic principles, concepts, documentation and record-keeping requirements of Quality Management Systems in the pharmaceutical industry in compliance with the regulatory requirements.
MQA102.2	To appraise the knowledge of the regulatory requirements and standards for quality management in the pharmaceutical industry.
MQA102.3	To summarize the different types of quality control and quality assurance techniques used in the pharmaceutical industry.
MQA102.4	To explore the knowledge of statistical quality control techniques for product and process monitoring.
MQA102.5	To comprehend the principles of risk management in the pharmaceutical industry.

MQA103. QUALITY CONTROL AND QUALITY ASSURANCE

Subject- QUALITY CONTROL AND QUALITY ASSURANCE (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MQA103.1	To understand and differentiate quality control and quality assurance and responsibilities their responsibilities
MQA103.2	To discuss GMP, good laboratory practices for non-clinical laboratory guidelines, ICH Guidelines by various regulated countries
MQA103.3	To learn pharmacopoeial guidelines about in process quality control testing
MQA103.4	To appreciate the need and importance of documentation, CTDs and e CTDs in pharmaceutical industry
MQA103.5	To apply the quality assurance aspects of manufacturing and process control

MQA104. PRODUCT DEVELOPMENT AND TECHNOLOGY TRANSFER

Subject- PRODUCT DEVELOPMENT AND TECHNOLOGY TRANSFER (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MQA104.1	To understand the different stages involved in the product development process, such as formulation development, process development, and scale-up.
MQA104.2	To appraise the regulatory requirements for the approval of a new drug product, including FDA and EMA regulations.
MQA104.3	To summarize the principles and techniques of technology transfer from the laboratory to the commercial scale.
MQA104.4	To elaborate the principles and basics of Preformulation studies.
MQA104.5	To understand the basics of pharmaceutical packaging.

MQA105. PHARMACEUTICAL QUALITY ASSURANCE PRACTICAL – I

Subject- PHARMACEUTICAL QUALITY ASSURANCE PRACTICAL – I (Practical)

Sr. no	On completion of the course the students shall able to (Statement)
MQA105.1	To understand Estimation of process capability
MQA105.2	To Apply In process and finished product quality control tests for tablets, capsules, parenteral and semisolid dosage forms
MQA105.3	Estimation of drug in pharmaceutical by using modern analytical techniques
MQA105.4	To learn Development of Stability study protocol for pharmaceuticals
MQA105.5	To Provide pre-formulation study for successful formulation of pharmaceuticals

SEMESTER II

MQA201. HAZARDS AND SAFETY MANAGEMENT

Subject- HAZARDS AND SAFETY MANAGEMENT (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MQA201.1	To Understandbasic knowledge about the environment and its allied problems
MQA201.2	ToRecognize the concept of different kinds of hazard management system
MQA201.3	To Apply Hazard assessment, procedure, methodology for provide safe industrial atmosphere.
MQA201.4	To Learn the hazard risk management in workplace.
MQA201.5	To Provide comprehensive knowledge on the safety management

MQA202. PHARMACEUTICAL VALIDATION

Subject- PHARMACEUTICAL VALIDATION (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MQA202.1	To understand the principles and concepts of validation in the pharmaceutical industry along with documentation and record-keeping requirements.
MQA202.2	To summarize different types of validation and the regulatory requirements for validation in the pharmaceutical industry.
MQA202.3	To design and implement a validation protocol for a pharmaceutical process.
MQA202.4	To understand the principles and techniques of quality control and quality assurance in the validation process.

MQA203. AUDITS AND REGULATORY COMPLIANCE

Subject- AUDITS AND REGULATORY COMPLIANCE (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MQA203.1	CO 1: To Understand the different regulatory bodies and their roles in the pharmaceutical industry.
MQA203.2	CO 2: To summarize the methodology of auditing and its importance.
MQA203.3	CO 3: To prepare the auditing report and carry out the audit process.
MQA203.4	CO 4: To appraise Auditing of Quality Assurance and engineering department and Microbiological laboratory.

MQA204. PHARMACEUTICAL MANUFACTURING TECHNOLOGY

Subject- PHARMACEUTICAL MANUFACTURING TECHNOLOGY (Theory)

Sr. no	On completion of the course the students shall able to (Statement)
MQA204.1	To Understand the basics of developing a pharmaceutical industry along with plant layout and production planning.
MQA204.2	To Learn the basics of aseptic process technology in pharmaceutical manufacturing
MQA204.3	Discussion of advance process automation sterile manufacturing technologies
MQA204.4	To apply the basic and advanced technologies for non-sterile product manufacturing and coating along with pharmaceutical containers and closures.
MQA204.5	To Recognize the concept of Quality by design (QbD) and process analytical technology

MQA205. PHARMACEUTICAL QUALITY ASSURANCE PRACTICAL II

Subject- PHARMACEUTICAL QUALITY ASSURANCE PRACTICAL II (Practical)

Sr. no	On completion of the course the students shall able to (Statement)
MQA205.1	To Apply Validation of an analytical method for pharmaceuticals
MQA205.2	To Provide Qualification of Pharmaceutical Testing Equipments.
MQA205.3	To Learn Design of plant layout: Sterile and non-sterile
MQA205.4	To Understand Case studies on application of QbD
MQA205.5	To recognize identification & estimation of drug in pharmaceuticals & assess the impurities.