FACULTY OF PHARMACEUTICAL SCIENCES

Effective from Academic Batch: 2025-26

Programme : **Master of Pharmacy (Pharmaceutical Quality Assurance)**

Semester : **I**

Course Code : **108300101**

Course Title : **Modern Pharmaceutical Analytical Techniques**

Course Objectives: upon completion of the course the student shall be able to
1. Chemicals and Excipients
2. The analysis of various drugs in single and combination dosage forms
3. Theoretical and practical skills of the instruments

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
4	-	-	4	25/10	75/30	-	-	100/50

* **J**: Jury; **V**: Viva; **P**: Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	**UV-Visible spectroscopy:** Introduction, Theory, Laws, Instrumentation associated with UV-Visible spectroscopy, Choice of solvents and solvent effect and Applications of UV – Visible Spectroscopy **IR spectroscopy:** Theory, Modes of Molecular vibrations, Sample handling, Instrumentation of Dispersive and Fourier - Transform IR Spectrometer, Factors affecting vibrational frequencies and Applications of IR spectroscopy **Spectro-fluorimetry**: Theory of Fluorescence, Factors affecting fluorescence, Quenchers, Instrumentation and Applications of fluorescence spectrophotometer **Flame emission spectroscopy and atomic absorption spectroscopy:** Principle, Instrumentation, Interferences and Applications	11
2	**NMR spectroscopy:** Quantum numbers and their role in NMR, Principle, Instrumentation, Solvent requirement in NMR, Relaxation process, NMR signals in various compounds, Chemical shift, Factors influencing chemical shift, Spin-Spin coupling, Coupling constant, Nuclear magnetic double resonance, Brief outline of principles of FT-NMR and 13C NMR. Applications of NMR spectroscopy	10

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3	**Mass Spectroscopy:** Principle, Theory, Instrumentation of Mass Spectroscopy, Different types of ionization like electron impact, chemical, field, FAB and MALDI, APCI, ESI, APPI Analyzers of Quadrupole and Time of Flight, Mass fragmentation and its rules, Meta stable ions, Isotopic peaks and Applications of Mass Spectroscopy	**10**
4	**Chromatography**: Principle, apparatus, instrumentation, chromatographic parameters, factors affecting resolution and applications of the following: a) Paper chromatography b) Thin Layer chromatography c) Ion exchange chromatography d) Column chromatography e) Gas chromatography f) High Performance Liquid chromatography g) Affinity chromatography	**10**
5	a. **Electrophoresis**: Principle, Instrumentation, working conditions, factors affecting separation and applications of the following: a) Paper electrophoresis b) Gel electrophoresis c) Capillary electrophoresis d) Zone electrophoresis e) Moving boundary electrophoresis f) Iso electric focusing b. **X ray Crystallography**: Production of X – rays, Different X – ray diffraction methods, Bragg's law, Rotating crystal technique, X – ray powder technique, Types of crystals and applications of X – ray diffraction.	**9**
6	**Potentiometry**: Principle, thermal transitions and instrumentation (heat flux and power compensation and designs) working, Ion selective Electrodes and Application of potentiometry. **Thermal Analysis:** Polymer behaviour, factors affecting and instrumentation, and working, application of TGA	**9**

Reference Books:

1	Spectrometric Identification of Organic compounds - Robert M Silverstein, Sixth edition, John Wiley & Sons, 2004.
2	Principles of Instrumental Analysis - Doglas A Skoog, F. James Holler, Timothy A. Nieman, 5th edition, Eastern press, Bangalore, 1998.
3	Instrumental methods of analysis – Willards, 7th edition, CBS publishers.
4	Practical Pharmaceutical Chemistry – Beckett and Stenlake, Vol II, 4th edition, CBS Publishers, New Delhi, 1997.
5	Organic Spectroscopy - William Kemp, 3rd edition, ELBS, 1991.
6	Quantitative Analysis of Drugs in Pharmaceutical formulation - P D Sethi, 3rd Edition, CBS Publishers, New Delhi, 1997.
7	Pharmaceutical Analysis- Modern methods – Part B - J W Munson, Volume 11, Marcel Dekker Series
8	Pharmaceutical Analysis: A Textbook for Pharmacy Students and Pharmaceutical Chemists – David G. Watson, 2nd Edition, Churchill Livingstone, 2005.

Pedagogy:

1. ICT tools (LCD projector, Laptop, Smart board)

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						**R**: Remembering; **U**: Understanding; **A**: Applying; **N**: Analyzing; **E**: Evaluating; **C**: Creating
R	**U**	**A**	**N**	**E**	**C**	
40	40	10	10	0	0	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Explain principle, instrumentation and applications of UV-visible, IR, fluorimetric and atomic spectroscopic techniques	**25**
CO-2	Explain principle, instrumentation and application of Mass and NMR spectroscopy	**25**
CO-3	Describe principle, instrumentation and applications of chromatographic techniques.	**25**
CO-4	Describe principles, instrumentation and applications of electrophoresis and X-ray methods	**15**
CO-5	Explain principles, instrumentation and applications of thermal and potentiometric methods of analysis.	**10**

Curriculum Revision:	
Version:	1
Drafted on (Month-Year):	June 2025
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FACULTY OF PHARMACEUTICAL SCIENCES

Effective from Academic Batch: 2025 – 26

Programme : **Master of Pharmacy (Pharmaceutical Quality Assurance)**

Semester : **I**

Course Code : **108330102**

Course Title : **Quality Management System**

Course Objectives: At completion of the course the student shall be able to understand

1. The importance of quality
2. ISO management systems
3. Tools for quality improvement
4. Analysis of issues in quality
5. Quality evaluation of pharmaceuticals
6. Stability testing of drug and drug substances
7. Statistical approaches for quality

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
4	-	-	4	25/10	75/30	-	-	100/50

* **J**: Jury; **V**: Viva; **P**: Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	Introduction to Quality: Evolution of Quality, Definition of Quality, Dimensions of Quality, **Quality as a Strategic Decision:** Meaning of strategy and strategic quality management, mission and vision statements, quality policy, Quality objectives, strategic planning and implementation, McKinsey 7s model, Competitive analysis, Management commitment to quality. **Customer Focus:** Meaning of customer and customer focus, Classification of customers, Customer focus, Customer perception of quality, Factors affecting customer perception, Customer requirements, Meeting customer needs and expectations, Customer satisfaction and Customer delight, Handling customer complaints, Understanding customer behavior, concept of internal and external customers. Case studies. **Cost of Quality:** Cost of quality, Categories of cost of Quality, Models of cost of quality, optimizing costs, Preventing cost of quality	12

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2	**Pharmaceutical quality Management:** Basics of Quality Management, Total Quality Management (TQM), Principles of Six sigma, ISO 9001:2008, 9001:2015, ISO 14001:2004, Pharmaceutical Quality Management – ICH Q10, Knowledge management, Quality Metrics, Operational Excellence and Quality Management Review. OSHAS guidelines, NABL certification and accreditation, CFR-21 part 11, WHO-GMP requirements.	**12**
3	**Six System Inspection Model:** Quality Management system, Production system, Facility and Equipment system, Laboratory control system, Materials system, Packaging and labelling system. Concept of self-inspection. **Quality systems:** Change Management/ Change control. Deviations, Out of Specifications (OOS), Out of Trend (OOT), Complaints - evaluation and handling, Investigation and determination of root cause, Corrective & Preventive Actions (CAPA), Returns and Recalls, Vendor Qualification, Annual Product Reviews, Batch Review and Batch Release. Concept of IPQC, area clearance/ Line clearance.	**12**
4	**Drug Stability:** ICH guidelines for stability testing of drug substances and drug products. Study of ICH Q8, Quality by Design and Process development report **Quality risk management:** Introduction, risk assessment, risk control, risk review, risk management tools, HACCP, risk ranking and filtering according to ICH Q9 guidelines.	**12**
5	**Statistical Process Control (SPC):** Definition and Importance of SPC, Quality measurement in manufacturing, Statistical control charts - concepts and general aspects, Advantages of statistical control, Process capability, Estimating Inherent or potential capability from a control chart analysis, Measuring process control and quality improvement, Pursuit of decreased process variability.	**08**
6	Regulatory Compliance through Quality Management and development of Quality Culture Benchmarking: Definition of benchmarking, Reasons for benchmarking, Types of Benchmarking, Benchmarking process, Advantages of benchmarking, Limitations of benchmarking	**04**

Reference Books:

1	Implementing Juran's Road Map for Quality Leadership: Benchmarks and Results, By Al Endres, Wiley, 2000
2	Understanding, Managing and Implementing Quality: Frameworks, Techniques and Cases, By Jiju Antony; David Preece, Routledge, 20
3	Organizing for High Performance: Employee Involvement, TQM, Reengineering, and Knowledge Management in the Fortune 1000: The CEO Report By Edward E. Lawler; Susan Albers Mohrman; George Benson, Jossey-Bass, 2001
4	Corporate Culture and the Quality Organization By James W. FairfieldSonn, Quorum
5	The Quality Management Sourcebook: An International Guide to Materials and Resources By Christine Avery; Diane Zabel, Routledge, 1997
6	The Quality Toolbox, Second Edition, Nancy R. Tague, ASQ Publications
7	Juran's Quality Handbook, Sixth Edition, Joseph M. Juran and Joseph A
8	Root Cause Analysis, The Core of Problem Solving and Corrective Action, Duke Okes, 2009, ASQ Publication

Pedagogy:

1. ICT tools (LCD projector, Laptop, Smartboard)

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Distribution of Theory Marks in %						R: Remembering; U: Understanding; A: Applying; N: Analyzing; E: Evaluating; C: Creating
R	U	A	N	E	C	
30	50	10	10	0	0	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Explain the dimensions of quality, strategic quality decision, customer focus concepts, and cost of quality models in pharmaceutical context.	**20**
CO-2	Describe pharmaceutical quality management systems including TQM, Six Sigma, ISO standards, ICH Q10, NABL, and WHO-GMP regulatory requirements for pharmaceutical operations.	**20**
CO-3	Explain the six-system inspection model, change and quality control systems in pharmaceutical manufacturing.	**25**
CO-4	Describe ICH guidelines for drug stability testing, Quality by Design, Process development, and quality risk management tools for pharmaceutical drug substances and drug products.	**20**
CO-5	Explain statistical process control techniques and benchmarking methods to ensure regulatory compliance and continuous quality improvement in pharmaceutical operations.	**15**

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FACULTY OF PHARMACEUTICAL SCIENCES

Effective from Academic Batch: 2025-26

Programme : **Master of Pharmacy (Pharmaceutical Quality Assurance)**

Semester : **I**

Course Code : **108330103**

Course Title : **Quality Control and Quality Assurance**

Course Objectives: Upon completion of the course the student shall be able to

1. The cGMP aspects in a pharmaceutical industry
2. To appreciate the importance of documentation
3. To understand the scope of quality certifications applicable to pharmaceutical industries
4. To understand the responsibilities of QA & QC Departments

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
4	-	-	4	25/10	75/30	-	-	100/50

* **J**: Jury; **V**: Viva; **P**: Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	Concept and Evolution of Quality Control and Quality Assurance, Good Laboratory Practice, GMP, Overview of ICH Guidelines – QSEM, with special emphasis on Q-series guidelines. **Good Laboratory Practices:** Scope of GLP, Definitions, Quality assurance unit, protocol for conduct of nonclinical testing, control on animal house, report preparation and documentation. CPCSEA guidelines	12
2	**cGMP guidelines** according to schedule M, USFDA (inclusive of CDER and CBER), Pharmaceutical Inspection Convention (PIC), WHO and EMEA covering: Organization and personnel responsibilities, training, hygiene and personal records, drug industry location, design, construction, and plant lay out, maintenance, sanitation, environmental control, utilities and maintenance of sterile areas, control of contamination and Good Warehousing Practice.	12

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3	Analysis of raw materials, finished products, packaging materials, in process quality control (IPQC), Developing specification (ICH Q6 and Q3), Purchase specifications and maintenance of stores for raw materials. In process quality control and finished products quality control for following formulation in Pharma industry according to Indian, US and British pharmacopoeias: tablets, capsules, ointments, suppositories, creams, parenteral, ophthalmic, and surgical products (How to refer pharmacopoeias)	**12**
4	**Documentation in pharmaceutical industry:** Three tier documentation, Policy, Procedures and Work instructions, and records (Formats), Basic principles- How to maintain, retention and retrieval etc. Standard operating procedures (How to write), Master Formula Record, Batch Formula Record, Quality audit plan and reports. Specification and test procedures, Protocols and reports. Distribution records. Electronic data handling. Concepts of controlled and uncontrolled documents. Submission documents for regulators DMFs, as Common Technical Document and Electronic Common Technical Documentation (CTD, eCTD). Concept of regulated and non-regulated markets.	**12**
5	**Manufacturing operations and controls:** Sanitation of manufacturing premises, mix-ups and cross contamination, processing of intermediates and bulk products, packaging operations, IPQC, release of finished product, process deviations, charge-in of components, time limitations on production, drug product inspection, expiry date calculation, calculation of yields, production record review, change control, sterile products, aseptic process control, packaging reprocessing, salvaging, handling of waste and scrap disposal. Introduction, scope and importance of intellectual property rights. Concept of trade mark, copyright and patents.	**12**

Reference Books:

1	Quality Assurance Guide by organization of Pharmaceutical Procedures of India, 3rd revised edition, Volume I&II, Mumbai, 1996.
2	Good Laboratory Practice Regulations, 2nd Edition, Sandy Weinberg Vol. 69, Marcel Dekker Series, 1995.
3	Quality Assurance of Pharmaceuticals- A compedium of Guide lines and related materials Vol. I & II, 2nd edition, WHO Publications, 1999.
4	How to Practice GMP's– P P Sharma, Vandana Publications, Agra, 1991.
5	The International Pharmacopoeia – Vol. I, II, III, IV & V - General Methods of Analysis and Quality specification for Pharmaceutical Substances, Excipients and Dosage forms, 3rd edition, WHO, Geneva, 2005.
6	Good laboratory Practice regulations– Allen F. Hirsch, Vol. 38, Marcel Dekker Series, 1989.
7	ICH guidelines
8	ISO 9000 and total quality management
9	The drugs and cosmetics act 1940– Desh Pande, Nilesh Gandhi, 4th edition, Susmit Publishers, 2006.
10	QA Manual– D. H. Shah, 1st edition, Business Horizons, 2000.
11	Good Manufacturing Practices for Pharmaceuticals a plan for total quality control– Sidney H. Willig, Vol. 52, 3rd edition, Marcel Dekker Series.
12	Steinborn L. GMP/ISO Quality Audit Manual for Healthcare Manufacturers and Their Suppliers, 6th edition, Vol. 1 - With Checklists and Software Package. Taylor & Francis; 2003.

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13	Sarker DK. Quality Systems and Controls for Pharmaceuticals. John Wiley & Sons; 2008.
14	Packaging of Pharmaceuticals.
15	Schedule M and Schedule N.

Pedagogy:

1. ICT tools (LCD projector, Smart board, Laptop)

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						**R**: Remembering; **U**: Understanding; **A**: Applying; **N**: Analysing; **E**: Evaluating; **C**: Creating
R	**U**	**A**	**N**	**E**	**C**	
40	50	5	5	0	0	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr. No.	Course Outcome Statements	%weightage
CO-1	Explain the concept of quality assurance, quality control, overview of ICH guidelines, GLP and CPCSEA guidelines in Pharmacy	**20**
CO-2	Describe the concept of cGMP, compare various cGMP guidelines, and understand Good Warehousing practice.	**20**
CO-3	Explain raw material evaluation, in process quality control and finished product quality control test for Pharmaceuticals	**20**
CO-4	Describe documentation in pharmaceutical industry	**20**
CO-5	Explain various manufacturing operations along with their controls, Concept of Intellectual property rights, trade mark, copyright, and patents.	**20**

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FACULTY OF PHARMACEUTICAL SCIENCES

Effective from Academic Batch: 2025 – 26

Programme : **Master of Pharmacy (Pharmaceutical Quality Assurance)**

Semester : **I**

Course Code : **108330104**

Course Title : **Product Development and Technology Transfer**

Course Objectives: Upon completion of this course the student should be able to

1. To understand the new product development process
2. To understand the necessary information to transfer technology from R&D to actual manufacturing by sorting out various information obtained during R&D
3. To elucidate necessary information to transfer technology of existing products between various manufacturing place

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
4	-	-	4	25/10	75/30	-	-	100/50

* **J**: Jury; **V**: Viva; **P**: Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	**Principles of Drug Discovery and Development:** Introduction, Clinical research process. Development and informational content for Investigational New Drugs Application (IND), New Drug Application (NDA), Abbreviated New Drug Application (ANDA), Supplemental New Drug Application (SNDA), Scale Up Post Approval Changes (SUPAC) and Bulk active chemical Post approval changes (BACPAC), Post marketing surveillance, Product registration guidelines – CDSCO, USFDA.	12
2	**Pre-formulation Studies:** Introduction/concept, organoleptic properties, purity, impurity profiles, particle size, shape, and surface area. Solubility, Methods to improve solubility of Drugs: Surfactants & its importance, co-solvency. Techniques for the study of Crystal properties and polymorphism. Pre-formulation protocol, Stability testing during product development.	12
3	**Pilot Plant Scale up:** Concept, Significance, design, layout of pilot plant scale up study, operations, large scale manufacturing techniques (formula, equipment, process, stability and quality control) of solids, liquids, semisolid and parenteral dosage forms. New era of drug products: opportunities and challenges	12

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4	**Pharmaceutical Packaging:** Pharmaceutical dosage form and their packaging requirements, pharmaceutical packaging materials, medical device packaging, Enteral Packaging, Aseptic packaging systems, Container closure systems, Issues facing modern drug packaging, Selection, and evaluation of pharmaceutical packaging materials. **Quality Control Test:** Containers, closures, and secondary packing materials	**12**
5	**Technology Transfer:** Development of technology by R & D, Technology transfer from R & D to production, Optimization and Production, Qualitative and quantitative technology models. **Documentation in technology transfer:** Development report, technology transfer plan and Exhibit	**12**

Reference Books:

1	The process of new drug discovery and development. I and II Edition (2006) by Charles G. Smith, James T and O. Donnell. CRC Press, Group of Taylor and Francis.
2	Leon Lac Lachman, Herbert A. Liberman, Theory and Practice of Industrial Pharmacy. Marcel Dekker Inc. New York.
3	Sidney H Willing, Murray M, Tuckerman. Williams Hitchings IV, Good manufacturing of pharmaceuticals (A Plan for total quality control) 3rd Edition. Bhalani publishing house Mumbai.
4	Tablets Vol. I, II, III by Leon Lachman, Herbert A. Liberman, Joseph B. Schwartz, 2nd Edn. (1989) Marcel
5	Text book of Bio- Pharmaceutics and clinical Pharmacokinetics by Milo Gibaldi, 3rd Edn, Lea & Febriger, Philadelphia
6	Pharmaceutical product development. Vandana V. Patrevale. John I. Disouza. Maharukh T. Rustomji. CRC Press, Group of Taylor and Francis
7	Dissolution, Bioavailability and Bio-Equivalence by Abdou H.M, Mack Publishing company, Eastern Pennsylvania.
8	Remingtons Pharmaceutical Sciences, by Alfonso & Gennaro, 19th Edn. (1995)OO2C Lippincott; Williams and Wilkins A Wolters Kluwer Company, Philadelphia.
9	The Pharmaceutical Sciences; the Pharma Path way 'Pure and applied Pharmacy' by D. A Sawant, Pragathi Books Pvt. Ltd
10	Pharmaceutical Packaging technology by D.A. Dean. E.R. Evans, I.H. Hall. 1st Edition(Reprint 2006). Taylor and Francis. London

Pedagogy:

2. ICT tools (LCD projector, Smart board, Laptop)

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						**R**: Remembering; **U**: Understanding; **A**: Applying; **N**: Analyzing; **E**: Evaluating; **C**: Creating
R	**U**	**A**	**N**	**E**	**C**	
40	50	5	5	-	-	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Design the drug discovery and development, product registration guidelines	**20**
CO-2	Explain pre-formulation studies and stability testing during product development	**20**
CO-3	Explain the concept, significance, design, manufacturing techniques of pilot plant scale up, opportunities and challenges of new era of drug products	**20**
CO-4	Describe the requirements of pharmaceutical packaging and its quality control test.	**20**
CO-5	Explain the concept, working style and documentation in technology transfer.	**20**

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FACULTY OF PHARMACEUTICAL SCIENCES

Effective from Academic Batch: 2025-26

Programme : **Master of Pharmacy (Pharmaceutical Quality Assurance)**

Semester : **I**

Course Code : **108330105**

Course Title : **Pharmaceutical Quality Assurance Practical – I**

Course Objectives:

At completion of this course student shall be able to

1. Apply analytical techniques in determination of Bulk drug, drugs in dosage form
2. Perform quantitative estimation of functional groups
3. Perform analysis of food products and additives
4. Perform calibration and validation of Instruments and process

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
-	-	12	6	-	-	50/20	100/40	150/75

* **J**: Jury; **V**: Viva; **P**: Practical

List of Practicals:

1	Analysis of pharmacopeial compounds and their formulations (Tablet/Capsule/semisolids) by UV Vis spectrophotometer
2	Simultaneous estimation of multi component containing formulations by UV spectrophotometry
3	Experiments based on HPLC
4	Experiments based on Gas Chromatography
5	Estimation of riboflavin/quinine sulphate by fluorimetry
6	Estimation of sodium/potassium by flame photometry
7	Case studies on • Total Quality Management • Six Sigma • Change Management/ Change control. Deviations, • Out of Specifications (OOS) • Out of Trend (OOT) • Corrective & Preventive Actions (CAPA) • Deviation

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8	Development of Stability study protocol
9	Estimation of process capability
10	In process and finished product quality control tests for tablets, capsules, parenterals and semisolid dosage form
11	Assay of raw materials as per official monographs
12	Testing of related and foreign substances in drugs and raw materials
13	To carry out pre formulation study for tablets, parenterals (2 experiment).
14	To study the effect of pH on the solubility of drugs, (1 experiment)
15	Quality control tests for Primary and secondary packaging materials
16	Accelerated stability studies (1 experiment)
17	Improved solubility of drugs using surfactant systems (1 experiment)
18	Improved solubility of drugs using co-solvency method (1 experiment)
19	Determination of Pka and Log p of drugs.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Explain proficiency in the analysis of pharmacopoeial compounds and their formulations using advanced analytical techniques	**30%**
CO-2	Find the ability to perform quality control tests for raw materials, in-process materials, and finished pharmaceutical products, ensuring compliance with official standards.	**30%**
CO-3	Explain theoretical knowledge in practical scenarios to conduct stability studies, calibration, validation, and develop protocols for pharmaceutical quality assurance processes.	**20%**
CO-4	Describe the evaluation and implementation quality management practices.	**10%**
CO-5	Provide written responses to questions related to various aspects of the practicals performed	**10%**

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FACULTY OF PHARMACEUTICAL SCIENCES

Effective from Academic Batch: 2025-26

Programme: **Master of Pharmacy (Pharmaceutical Quality Assurance)**

Semester: **I**

Course Code: **108330106**

Course Title: **Seminar/Assignment**

Course Objectives:
At completion of this course student shall be able to
1. Develop skills to collect and organize data
2. Acquire knowledge on the current topic in field pharmaceutical science
3. Perform effective presentation and communication skill

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
-	-	8	4	-	-	100/40	-	100/50

* **J**: Jury; **V**: Viva; **P**: Practical

Guidelines

Seminar will be given on the current topic in the field of pharmaceutical science. Student will gather information, compile data in the form of report and give presentation on the topic given.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Develop skills to collect and organize information for the given topic.	25
CO-2	Compile data and develop write-up skill on the topic given for seminar presentation.	25
CO-3	Develop communication and presentation skills.	25
CO-4	Effectively respond to the queries and questions raised.	25

Curriculum Revision:	
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