For-1 Year PG Programme

Scheme C-1

Master of Science { M.Sc. Drug and Pharmaceutical Chemistry)} Major Practicum Component

OPTION 1 : Only Course Work (Applicable to all UTDs/ Colleges)						
First Year	SEM-I	500	Introduction to Pharmacy Drug Regulatory Act, Intellectual **Property Rights**(PC 101)(6 Credit)	Introduction to Pharmacy Drug Regulatory Act, Intellectual **Property Rights**(PCPR1)(4 Credit)	Internship/ Apprenticeship/ Seminar (2 Credits)	22
		500	Principles OF organic pharmaceutical Chemistry(PC102)(6 Credit)	Principles OF organic pharmaceutical Chemistry(PCPR2)(4 Credit)		
	SEM-II	500	Instrumental Methods of Analysis(PC201)(6 Credit)	Instrumental Methods of Analysis(PCPR3)(4 Credit)	Value – Added Course (2 Credits)	22
		500	Drug Pharmacokinetics and drug development(PC202)(6 Credit)	Drug Pharmacokinetics and drug development(PCPR4)(4 Credit)		
Note: Student Who exit at the end of first year shall be awarded a Post graduate Diploma						
Option 2 : Course work and research work (Applicable to all UTDs/ Colleges having research centres recognized by the university)						
First Year	SEM-I	500	Introduction to Pharmacy Drug Regulatory Act, Intellectual **Property Rights**(PC101)(6 Credit)	Introduction to Pharmacy Drug Regulatory Act, Intellectual **Property Rights**(PCPR1)(4 Credit)	Seminar (2 Credits))	22
		500	Principles OF organic pharmaceutical Chemistry(PC102)(6 Credit)	Principles OF organic pharmaceutical Chemistry(PCPR2)(4 Credit)		
	SEM-II				Research Theses / Project/ Patent (22 Credit)	22
Option 3 : Only research work (Applicable to all UTDs/ Colleges having research centres recognized by the university)						
Second Year	SEM-I	Research Theses / Project/ Patent (22 Credit)				22

	SEM-II	Research Theses / Project/ Patent (22 Credit)	22

1.*[VAC]= Constitutional , Human and moral value (CHM) and Employability and Entrepreneurship skills (EESC) .

2. UTDs / Colleges with research centres have the choice of running all the options mentioned above.

3.Student having four year Undergraduate degree (honours/ honours with research) are eligible for direct lateral entry in the semester I of 1 year PG programme.

Department of Higher Education
Madhya Pradesh

Syllabus

M.Sc. Drugs and Pharmaceutical Chemistry

2025-26

For 1- Year PG Programme

Scheme C-1

(With Major Practicum Component)

Semester : I -II

For 1Year PG Programme

(Scheme C-1)

With Major Practicum Component

Drug and Pharmaceutical Chemistry-Core(Theory) Syllabus

M.Sc. I semester

Part A- Introduction				
Program-1Year PG		Class-M.Sc.	Semester-I	Session 2025-26
Subject: Drug and Pharmaceutical Chemistry				
1	Course Code	PC 101		
2	Course Title	Introduction to Pharmacy Drug Regulatory Act, Intellectual **Property Rights**		
3	Course Type	Course (Paper 1)		
4	Pre-requisite	To Study this course, Students must have Pharmaceutical Chemistry and Chemistry as one of the subject in B.Sc. Degree Course.		
5.	Course Learning Outcome (CLO)	On Successful completion of this course, the Student Will be able to: 1. The students understand the importance of quality in pharmaceutical products. 2. The student is explored into importance of Good practices such as GMP, GLP etc. 3. The factors affecting the quality of pharmaceutical is explored 4. understand the regulatory aspects of pharmaceutical taught to the student. 5. The process involved in manufacturing of pharmaceuticals different section / department and activity is learnt. 6. The various documentation process is highlighted to the students.		
6.	Credit Value	Theory-06		
7.	Total Marks	Maximum Marks : Total 100 University Exam (UE)-60 CCE-40	Minimum Passing Marks 40	

Part-B Content of the Course		
Total No. of lectures-Tutorials- Practical (hours per week):06 L-T-P:90-0-0(Total Hours)		
Unit	Topic	No. of Lectures
I	Introduction to Pharmacy, Careers in Pharmacy, Codes of pharmaceutical ethics, Importance of Pharmaceutical Chemistry, Pharmacopeia & its history (IP,BP, USP, NF)	15
II	Routes of drug administration. Introduction to tablets, capsule, suspension, emulsion, ointments etc, Introduction to NDDS.	15
III	Drug and Cosmetics Act with special reference to schedule M, GMP, GLP, GCP. USFDA, NDA, ANDA, Clinical Trials	15
IV	Concept of Quality & total Quality	15

	Management, Quality Assurance & Quality Control, IPQ A, IPQC	
V	Documentation and Maintenance of records, Intellectual property rights patents, Trademarks, Copyrights,Patents Act.	15

Part: C Learning Resources
Text books, Reference Books, Other Resources
Suggested Readings: I . Wilding, S.W., & Stoker, Good Manufacturing Practices for Pharmaceuticals, Marcel Dekker, New York. 2. Guarino, R.A., New Drug Approval Process, Marcel Dekker, New York. 3. Drug & Cosmetic Act 4. Patents Act. S. Consumer Protection Act. 6. Environmental Protection Act. 7. Federal Food, Drug & Cosmetic Act. 8. Bansol, IPR Guidelines for Pharm students and Researchers. 9. Pisano-FDA Regulatory Affairs. 10. Phillip W. Grubb, Patents for Chemicals, Pharmaceuticals and B ioiechnology. 11. Lehninger princlples of biochemistry, Albert L. Lehninger, David Lee Nelson, Michael W.H Freeman, 2008. 1 2. Harper's JIlustrated Biochemisty, Robert K. Murray, Mc. Gravy Hill 1 3. Biochemistry, keshav Trehan, New age Publishers. Pharmaceutical Chemistry paper II 14. Pennington- vol I & 11

Part D- Assessment and Evaluation		
Maximum Marks :100 Internal Assessment (CCE): 40 External Assessment (UE) :60		
Internal Assessment		
	Continuous and Cumulative Evaluation (CCE) Methods will be based on the following defined Components	Marks
1	Class Test	
2	Presentation/ Assignment/ Quiz/ Group Discussion	
3	Appropriate weightage of attendance in the class	
	Total	40
External Assessment		
Theory Paper as per University Examination		
	Total	60
	Grand Total	100

For1 Year PG Programme

(Scheme C-1)

With Major Practicum Component

Drug and Pharmaceutical Chemistry-Practical Syllabus

M.Sc. I semester

Part A Introduction				
Program-1 Year PG		Class-M.Sc.	Semester-I	Session 2025-26
Subject: Drug and Pharmaceutical Chemistry				
1	Course Code	PCPR1		
2	Course Title	Introduction to Pharmacy Drug Regulatory Act, Intellectual **Property Rights**		
3	Course Type	Practicum course		
4	Pre-requisite	To Study this course, Students must have Pharmaceutical Chemistry and Chemistry as one of the subject in B.Sc. Degree Course.		
5.	Course Learning Outcome (CLO)	On Successful completion of this course, the Student Will be able to: 1. The student is explored into importance of Good practices such as GMP, GLP etc. 2. The factors affecting the quality of pharmaceutical is explored 3. understand the regulatory aspects of pharmaceutical taught to the student. 4. The process involved in manufacturing of pharmaceuticals different section / department and activity is learnt. 5. The various documentation process is highlighted to the students.		
6.	Credit Value	Practical :04		
7.	Total Marks	Maximum Marks : Total 100 University Exam (UE)-60 CCE-40	Minimum Passing Marks 40	

Part-B Content of the Course	
Total No. of lectures-Tutorials- Practical (hours per week):08 L-T-P:120-0-0(Total Hours)	
A. Assignment / practice/ Survey/ field work	No. of hours:120
B. List of experiment to be performed in laboratory	
1. Industrial Visit for GMP and GLP. 2.Weight Variation, Hardness, Friability and Disintegration test of tablets. 3.Demonstration experiment on HPLC. 4. 5. Intellectual Property Right and their Value in Modern Era. 5. Registration and Implementation of IPR in India. 6. Famous Trademark and their Stories. 7.Choose one Startup and explain its IPR Strategy.	

Part: C Learning Resources
Text books, Reference Books, Other Resources

Suggested Readings:

I . Willing, S.W., & Stoker, Good Manufacturing Practices for Pharmaceuticals, Marcel Dekker, New York.
5. Guarino, R.A., New Drug Approval Process, Marcel Dekker, New York.
6. Drug & Cosmetic Act
7. Patents Act.
S. Consumer Protection Act.
12. Environmental Protection Act.
13. Federal Food, Drug & Cosmetic Act.
14. Bansol, IPR Guidelines for Pharm students and Researchers.
15. Pisano-FDA Regulatory Affairs.
16. Phillip W. Grubb, Patents for Chemicals, Pharmaceuticals and B ioiechnology.
17. Lehninger princlples of biochemistry, Albert L. Lehninger, David Lee Nelson, Michael
W.H Freeman, 2008.
1 2. Harper's JIlustrated Biochemisty, Robert K. Murray, Mc. Gravy Hill
1 3. Biochemistry, keshav Trehan, New age Publishers.
Pharmaceutical Chemistry paper II
15. Pennington- vol I & 11

Part D- Assessment and Evaluation		
Maximum Marks :100 Internal Assessment (CCE): 40 External Assessment (UE) :60		
Internal Assessment		
	Continuous and Cumulative Evaluation (CCE) Methods will be based on the following defined Components	Marks
1	Class / Laboratory Practical test	
2	Seminar/ Demonstration / Viva-voice/ Practical Record Etc	
3	Appropriate weightage of attendance in the class	
	Total	40
External Assessment		
Practicum Paper as per University Examination		
	Total	60
	Grand Total	100

For 1 Year PG Programme

(Scheme C-1)

With Major Practicum Component

Drug and Pharmaceutical Chemistry-Core(Theory) Syllabus

M.Sc. I semester

Part A:Introduction				
Program-1 Year PG		Class-M.Sc.	Semester-I	Session 2025-26
Subject: Drug and Pharmaceutical Chemistry				
1	Course Code	PC102		
2	Course Title	PRINCIPLES OF ORGANIC PHARMACEUTICAL CHEMISTRY		
3	Course Type	Course (Paper2)		
4	Pre-requisite	To Study this course, Students must have Pharmaceutical Chemistry and Chemistry as one of the subject in B.Sc. Degree Course.		
5.	Course Learning Outcome (CLO)	On Successful completion of this course, the Student Will be able to: 1. To carry out an organic reaction , including isolating, purifying and characterizing the product. 2. Student will understand about various name reaction. 3. Understanding about the Stereo- chemistry. 4. Student will understand the aromaticity.		
6.	Credit Value	Theory-06		
7.	Total Marks	Maximum Marks : Total 100 University Exam (UE)-60 CCE-40	Minimum Passing Marks 40	

Part-B Content of the Course		
Total No. of lectures-Tutorials- Practical (hours per week):06 L-T-P:90-0-0(Total Hours)		
Unit	Topic	No. of Lectures
I	Stereo Chemistry and Conformational Analysis: Optical isomerism- Concept of Chirality, recognition of symmetry elements and chiral structures, R-S nomenclature, Diasterisomerism in acyclic and cyclic systems, Optical activity without asymmetric carbon atom (allenes, spiranes and biphenyls)	15
II	Geometrical Isomerism: Geometrical isomerism of olefins and oximes, E-Z nomenclature. Conformational Analysis: conformational analysis of ethane, butane, cyclohexane and decalins. Effect of conformation on reactivity in acyclic compounds and cyclohexenes, Interconversion of Fischer, Newman and	15

	Sawhorse projections. Stereo selective Synthesis: Asymmetric Synthesis	
III	Reaction Intermediates: Structure, formation and examples of participation in chemical reaction of the following: - Carbocation, Carbanion, Nitrenes, Carbenes, Arynes, Free radicals. (B) Mechanism of Organic Reactions: - Types of reactions, thermodynamic and kinetic requirements. Potential energy diagram, methods of determining reaction mechanisms, (C) Aliphatic Nucleophilic Substitute on: SN1 „ SN2, SNi;, factors affecting mechanism, hydrolysis of ester,	15
IV	Elimination Reactions: E1 E2 and E1cb mechanism, Hoffman and Saytzeff elimination. Addition Reactions: General mechanism, hydroboration, epoxidation, Wittig reaction. Aromaticity concept: Huckle's rule and its limitations, Benzenoid and non- benzenoid compounds, cyclopentadienyl anion, tropylium cation, azulenes, fullerenes. Synthetic applications, mechanisms and stereochemistry (wherever applicable) of the following organic reactions and molecular rearrangements', - Pinacol - pinacolone rearrangements, Benzylic acid rearrangement, Beckmann rearrangement, Hoffmann-Curtius, Lossen and schmidt rearrangement, Claisen rearrangement	15
V	Study of reactions of synthetic importance: mechanisms and stereochemistry (whenever applicable) Birch reduction, Mannich reaction, Meerwein Pondorf - Verley reduction and Oppeneaur oxidation, Ozonolysis and hydrogenation, Diel's Alder reaction, Reformatsky reaction. Grignard reaction.	15

Part: C Learning Resources
Text books, Reference Books, Other Resources

Suggested Readings:

I .Eliel, E.L., Stereochemistry of Carbon compounds.
MC.Graw Hill BookCompany, Inc. Hew York.
2. March, J , Advanced Organic Chemistry, fieaction I'm(eebanism arid Structure, John Wiley and sons, New York.
3. Singh, H and Kapoor, V. R., Organic Pharmaceuii
cal C hemisiry, Uallabh Prakash an Delhi.
4. Gould, E.S., Mechanism and structure in Organic Chemistry, Holt, Rinewan and Winston , New York.
5. Abraham D.J,, ed..Burger's Medicinal Chyem sNew Jersey.
A Drug Discovery. Vol. I-VI, loll Wiley & sons,
6.Ford M. E., Catalysis of organic reactions. Marcel Deter Inc., New York.
7 Laszlo Kurti, Barbara Czako, Strategic Applications of Name reaction in Organic
Synthesis, Elsevier, Acadeir ie Press, New York.
8. P S Kalsi, Orgwic reactions and their mechanism,

Part D- Assessment and Evaluation		
Maximum Marks :100 Internal Assessment (CCE): 40 External Assessment (UE) :60		
Internal Assessment		
	Continuous and Cumulative Evaluation (CCE) Methods will be based on the following defined Components	Marks
1	Class Test	
2	Presentation/ Assignment/ Quiz/ Group Discussion	
3	Appropriate weightage of attendance in the class	
	Total	40
External Assessment		
Theory Paper as per University Examination		
	Total	60
	Grand Total	100

For1 Year PG Programme

(Scheme C-1)

With Major Practicum Component

Drug and Pharmaceutical Chemistry-Practical Syllabus

M.Sc. I semester

Part A : Introduction				
Program-1 Year PG		Class-M.Sc.	Semester-I	Session 2025-26
Subject: Drug and Pharmaceutical Chemistry				
1	Course Code	PCPR2		
2	Course Title	PRINCIPLES OF ORGANIC PHARMACEUTICAL CHEMISTRY		
3	Course Type	Practicum course		
4	Pre-requisite	To Study this course, Students must have Pharmaceutical Chemistry and Chemistry as one of the subject in B.Sc. Degree Course.		
5.	Course Learning Outcome (CLO)	On Successful completion of this course, the Student Will be able to: 1. Student will understand about various name reaction. 2. Understanding about the Stereo- chemistry. 3. Student will understand the aromaticity.		
6.	Credit Value	Practical :04		
7.	Total Marks	Maximum Marks : Total 100 University Exam (UE)-60 CCE-40	Minimum Passing Marks 40	

Part-B Content of the Course	
Total No. of lectures-Tutorials- Practical (hours per week):08 L-T-P:120-0-0(Total Hours)	
A. Assignment / practice/ Survey/ field work	No. of hours:120
B. List of experiment to be performed in laboratory	
1. Stereochemical studies of organic compounds with the help of molecular model kit. 2 Preparation of Drug and Organic Compound. 3.Detection of functional group . 4. Preparation of phenolphthalein . 5.Identification test of Organic Drug:-1. Acetazolamide 2.Caffeine 3.Chloramphenicol 4. Ascorbic Acid 6. Isolation of caffeine from Tea Leaves.	

Part C-Learning Resources

Text Books, Reference Books, Other resources

Suggested Readings:

1. B.S. Furniss, A.J.Hannaford, P.W.G. Smith, A.R. Tatchell, Vogel's Textbook of Practical Organic Chemistry, 5th Edition, Part one, Longman Scientific & Technical Publisher, (1989)
2. A.K. Manna, Practical Organic Chemistry, 2nd Edition, Books & Allied Publisher, (2018)
3. F. G. Mann, B.C. Saunders, Practical Organic Chemistry, 4th Edition, Longman, (1973)
4. A.I. Vogel, Elementary Practical Organic Chemistry, 2nd Edition, Pearson, (2011)

Suggestive digital platforms/ web links

- https://www.orgsyn.org/demo.aspx?prep=CV1P0123

Part D- Assessment and Evaluation

Maximum Marks :100
Internal Assessment (CCE): 40
External Assessment (UE) :60

Internal Assessment

	Continuous and Cumulative Evaluation (CCE) Methods will be based on the following defined Components	Marks
1	Class / Laboratory Practical test	
2	Seminar/ Demonstration / Viva-voice/ Practical Record Etc	
3	Appropriate weightage of attendance in the class	
	Total	40

External Assessment

Practicum Paper as per University Examination	
Total	60
Grand Total	100

For 1 Year PG Programme

(Scheme C-1)

With Major Practicum Component

Drug and Pharmaceutical Chemistry-Core(Theory) Syllabus

M.Sc. II semester

Part A : Introduction				
Program-1 Year PG		Class-M.Sc.	Semester-II	Session 2025-26
Subject: Drug and Pharmaceutical Chemistry				
1	Course Code	PC201		
2	Course Title	INSTRUMENTAL METHODS OF ANALYSIS		
3	Course Type	Course (Paper1)		
4	Pre-requisite	To Study this course, Students must have Pharmaceutical Chemistry and Chemistry as one of the subject in B.Sc. Degree Course.		
5.	Course Learning Outcome (CLO)	On Successful completion of this course, the Student Will be able to: 1. Student will understand about the various analytical method. 2. Student will understand about the polarography instrument. 3. Student will understand about the concept of potentiometry techniques. 4. Student will understand the various titration which is used in conductometry,potentiometric.		
6.	Credit Value	Theory-06		
7.	Total Marks	Maximum Marks : Total 100 University Exam (UE)-60 CCE-40	Minimum Passing Marks 40	

Part-B Content of the Course		
Total No. of lectures-Tutorials- Practical (hours per week):06 L-T-P:90-0-0(Total Hours)		
Unit	Topic	No. of Lectures
I	Naphelometry and Tuibidimetry:- Theory of Naphetometry and turbidimetry, Instrumentation Single and double beam, Factors affecting measurements, applications of turbidimetry and naphelometry.	15
II	Fundamentals of Potentiometry, Poientiometeric Titrations (acid base titration, complexometric titration, oxidation reduction titration, precipitation titration) The Hydrogen electrode, the caJomel electrode, the glass electrode Polarography- Introduction, apparatus, factors affecting the limiting current and its applications Karl Fisher titrations	15

III	Amperometry- Principles, types of end points, amperometric titrations, apparatus, advantages and applications. Fluorimetry- Intorduction, theory, instrumentation and applications.	15
IV	Basic principle, instrumentation and applications of Atomic absorption spectroscopy arid Flame Photometry. Basic principle, instrumentation and applications of X-Ray diffraction	15
V	Basic principle, instrumentation and applications of Differential scarring calorimelry (DSC), Thermo-gravimetric analysis (TGA), Differential thermal analysis (DTA).	15

Part: C Learning Resources
Text books, Reference Books, Other Resources
Suggested Readings: Medicinal Chemistry by Ashutosh kar, 1. Foy'S Medicinal Chemi stry 2. Bergers Medicinal Chemistry, 3. Drug Dcsign By Pattrick. 4. Vogel's Textbook of Quantitative Analysis. 5. Instrumental Method of Analysis by Gutdeep Chatwal. 6. Smith HJ. Wi iliams H, eds, " Introduction to the principles of Drug Design" Wright Bosto n. 7. Silverman R.B "The organic C hemisiry of Drug Design and Drug Action" Academic Press New York. 8. Roberr GCK, ed., " Drug Aclion at the Molecular Level" University Prak Press Baltimore. Manin YC. "Quantitati ve I

Part D- Assessment and Evaluation		
Maximum Marks :100 Internal Assessment (CCE): 40 External Assessment (UE) :60		
Internal Assessment		
	Continuous and Cumulative Evaluation (CCE) Methods will be based on the following defined Components	Marks
1	Class Test	
2	Presentation/ Assignment/ Quiz/ Group Discussion	
3	Appropriate weightage of attendance in the class	
	Total	40
External Assessment		
Theory Paper as per University Examination		
	Total	60
	Grand Total	100

For 1 Year PG Programme

(Scheme C-1)

With Major Practicum Component

Drug and Pharmaceutical Chemistry-Practical Syllabus

M.Sc. II semester

Part A : Introduction				
Program-1 Year PG		Class-M.Sc.	Semester-II	Session 2025-26
Subject: Drug and Pharmaceutical Chemistry				
1	Course Code	PC201		
2	Course Title	INSTRUMENTAL METHODS OF ANALYSISs		
3	Course Type	Practicum course		
4	Pre-requisite	To Study this course, Students must have Pharmaceutical Chemistry and Chemistry as one of the subject in B.Sc. Degree Course.		
5.	Course Learning Outcome (CLO)	On Successful completion of this course, the Student Will be able to: 1. Estimate functional group such as Amino, Nitro, Hydroxyl and carboxylic in organic Compounds using classical , Analytical methods. 2. Determine the Strength and Concentration of Biological Important Molecule Including Glycene, Glucose. 3. .Identify plant pigment and calculate retention factor (RF) value using paper / TLC Chromatography techniques.		
6.	Credit Value	Practical :04		
7.	Total Marks	Maximum Marks : Total 100 University Exam (UE)-60 CCE-40	Minimum Passing Marks 40	

Part-B Content of the Course	
Total No. of lectures-Tutorials- Practical (hours per week):08 L-T-P:120-0-0(Total Hours)	
A. Assignment / practice/ Survey/ field work	No. of hours:120
B. List of experiment to be performed in laboratory	
1.Identification of pigment in the plant leaves and calculation of retention factor (RF) value by paper / TLC Chromatography. 2. Seperation of Amino Acid Mixture by Paper Chromatography. 3. Theoretical Analysis of TGA, DTA, and DSC. 4. Estimation of the strength of Glycene. 5. Estimation of Glucose. 6. Estimation of Amino, Nitro, Hydroxyl and Carboxylic Group.	

Part: C Learning Resources
Text books, Reference Books, Other Resources
Suggested Readings: 1.Vogel, A.I. Vogels Texbook of quantitative Chemical analysis, Pearson Education. 2. Chatwal , G.R., Anand , S.K. Instrumental methods of Chemical analysis , Himalaya Publication house. Suggestive digital platform web links: http://www.mphindigranthacademy.org/

Part D- Assessment and Evaluation		
Maximum Marks :100 Internal Assessment (CCE): 40 External Assessment (UE) :60		
Internal Assessment		
	Continuous and Cumulative Evaluation (CCE) Methods will be based on the following defined Components	Marks
1	Class / Laboratory Practical test	
2	Seminar/ Demonstration / Viva-voice/ Practical Record Etc	
3	Appropriate weightage of attendance in the class	
	Total	40
External Assessment		
Practicum Paper as per University Examination		
	Total	60
	Grand Total	100

For 1 Year PG Programme

(Scheme C-1)

With Major Practicum Component

Drug and Pharmaceutical Chemistry-Core(Theory) Syllabus

M.Sc. II semester

Part A : Introduction				
Program-1 Year PG		Class-M.Sc.	Semester-II	Session 2025-26
Subject: Drug and Pharmaceutical Chemistry				
1	Course Code	PC202		
2	Course Title	DRUG PHARMACOKINETICS AND DRUG DEVELOPMENT		
3	Course Type	Course (Paper2)		
4	Pre-requisite	To Study this course, Students must have Pharmaceutical Chemistry and Chemistry as one of the subject in B.Sc. Degree Course.		
5.	Course Learning Outcome (CLO)	On Successful completion of this course, the Student Will be able to: 1. Understand the concept of ADME of drug in human body. 2. Determine the various Pharmacokinetics parameters from either plasma concentration or urinary excretion data for drug. 3. Ability to design and perform in-vitro dissolution studies for various drugs as per the standard of official monograph. 4. Basic understanding about the concepts of in-vitro –in-vivo correlation.		
6.	Credit Value	Theory-06		
7.	Total Marks	Maximum Marks : Total 100 University Exam (UE)-60 CCE-40	Minimum Passing Marks 40	

Part-B Content of the Course		
Total No. of lectures-Tutorials- Practical (hours per week):06 L-T-P:90-0-0(Total Hours)		
Unit	Topic	No. of Lectures
I	Drug Targets — Nature and mechanism of functioning of drug targets: - Enzymes, receptors, proteins, nucleic acids	15
II	Pharmacokinetics: - Introduction (A) Drug absorption: - Introduction, cell membrane, drug solubility. (B) Drug distribution: - Introduction, distribution around Ibe blood supply, distribution to tissues, Distribution to cells. other distribution factors, blood brain barrier, placental barrier	15
III	Pharmacokinetics (a) Drug excretion: - Definition, lungs, the :	15

	bile duct, other routes and the kidneys. (b) Drug Administration: Definition, oral administration, mucous membranes, Rectal, inhalation topical, injection, subcutaneous implants. (c) Drug dosing: - Dosing, drug-half life, steady-state concentration, drug tolerance	
IV	Biological testing and bioassays - drug testing, drug testing in vitro. drug testing in vivo. Drug Dissolution & disintegration, apparatus and uses.	15
V	Structure activity relationships: - Definition & importance (A) Binding Interaction (Drug target) with one example of each type- ionic bonding, hydrogen bonding, Vender walls interaction, Dipole-dipole interactions and covalent bonds. (B) Functional groups as binding groups:- Alcohol s and phenols, amines, aldehydes rind ketones and Carboxylic acids	15

Part: C Learning Resources
Text books, Reference Books, Other Resources
Suggested Readings: 1. Smiih 1-NJ, \V illiarns H, eds, "ml i oduct ion to thc principles of Drug Design" Wright Boston. 2. Silverman R.B. "The organic Chemistry of Drug & Design and Drug Action" Academ ic Press New York. 3. Robert GCK,ed., "Drug Action the Molecular Level" University Prak Press BE iimore. 4. Martin YC. "Quaniita iive Drug Design" Dekker', New York. S. Lien EJ. SAR "S ids effects and Drug Desi gn" Dekker, New York. 6. William H, Malick JB "Orug D isco very and development'" Humana Press Cliflon. 7. Delgado JN, Remers WA eds "Wilson & G isvolds's Text Book or o‹g ic Medicinal &Pharmaceu ticalChemistry" Lippinco'' , New York. 8. Foye WO Principles of ivteclicinal chemistry Lea & Fcbiger. 9. Koro lkovas A, Burckhalter JI-1. "Essentials of' Medicinal Chemistry"' Wiley IntersKience. 10. Wol I ME, ed "The Basis of kledi cinal Chen iisiry, Burger's Medicinal Chemi siry" JoiuiW iley & Sons, New York 1 1. Ariens kJ "Drug Design" Academic Press New York.

Part D- Assessment and Evaluation		
Maximum Marks :100 Internal Assessment (CCE): 40 External Assessment (UE) :60		
Internal Assessment		
	Continuous and Cumulative Evaluation (CCE) Methods will be based on the following defined Components	Marks

1	Class Test	
2	Presentation/ Assignment/ Quiz/ Group Discussion	
3	Appropriate weightage of attendance in the class	
	Total	40
External Assessment		
Theory Paper as per University Examination		
	Total	60
	Grand Total	100

For 1 Year PG Programme

(Scheme C-1)

With Major Practicum Component

Drug and Pharmaceutical Chemistry-Practical Syllabus

M.Sc. II semester

Part A : Introduction			
Program-1 Year PG	Class-M.Sc.	Semester-II	Session 2025-26
Subject: Drug and Pharmaceutical Chemistry			
1	Course Code	PCPR4	
2	Course Title	DRUG PHARMACOKINETICS AND DRUG DEVELOPMENT	
3	Course Type	Practicum course	
4	Pre-requisite	To Study this course, Students must have Pharmaceutical Chemistry and Chemistry as one of the subject in B.Sc. Degree Course.	
5.	Course Learning Outcome (CLO)	On Successful completion of this course, the Student Will be able to: 1. Demostrate synthesis of various Pharmaceutical organic Compound. 2. Design experimental set up of various titration.	
6.	Credit Value	Practical :04	
7.	Total Marks	Maximum Marks : Total 100 University Exam (UE)-60 CCE-40	Minimum Passing Marks 40

Part-B Content of the Course	
Total No. of lectures-Tutorials- Practical (hours per week):08 L-T-P:120-0-0(Total Hours)	
A. Assignment / practice/ Survey/ field work	No. of hours:120
B. List of experiment to be performed in laboratory	
1. Preparation of Sulphanilamide fro Acetanilide. 2. Preparation of Picric Acid. 3. Preparation of Phenyl Benzoate 4. Preparation of m- dinitro benzene 5. Perform Assay of Aspirin 6. Perform assay of Ibuprofen 7. Preparation of Methyl orange.	

Part: C Learning Resources
Text books, Reference Books, Other Resources
Suggested Readings: 1.Vogel, A.I. Vogels Texbook of quantitative Chemical analysis, Pearson Education. 2. Chatwal , G.R., Anand , S.K. Instrumental methods of Chemical analysis , Himalaya Publication house. 3.Experimental Pharmaceutical Chemistry by Anees Ahmad Siddiqui , Seemi Siddiqui. Suggestive digital platform web links: http://www.mphindigranthacademy.org/

Part D- Assessment and Evaluation		
Maximum Marks :100 Internal Assessment (CCE): 40 External Assessment (UE) :60		
Internal Assessment		
	Continuous and Cumulative Evaluation (CCE) Methods will be based on the following defined Components	Marks
1	Class / Laboratory Practical test	
2	Seminar/ Demonstration / Viva-voice/ Practical Record Etc	
3	Appropriate weightage of attendance in the class	
	Total	40
External Assessment		
Practicum Paper as per University Examination		
	Total	60
	Grand Total	100