



**NOTIFICATION**

On the recommendations of Academic Council made in its 22<sup>nd</sup> (3/2024) meeting held on 30.09.2024, the Syndicate in its 69<sup>th</sup> (1/2025) meeting held on 17.01.2025 has approved the revised curricula of following programs for implementation w.e.f. **Spring 2026**.

I.	M.Phil in Pharmacology	(Annex-‘A’)
II.	M.Phil in Pharmaceutics	(Annex-‘B’)
III.	M.Phil in Pharmacy Practice	(Annex-‘C’)
IV.	M.Phil in Pharmaceutical Chemistry	(Annex-‘D’)
V.	M.Phil in Pharmacognosy	(Annex-‘E’)
VI.	Ph.D in Pharmacology	(Annex-‘F’)
VII.	Ph.D in Pharmaceutics	(Annex-‘G’)

  
(WAQAR AHMAD)  
Additional Registrar (General)

Dated: 29.10.2025

No. SU/Acad/25/ 1162

**Distribution:**

- Principal, College of Pharmacy
- Controller of Examinations
- Director Academics

**C.C:**

- Dean, Faculty of Pharmacy
- Director, QEC
- Secretary to the Vice-Chancellor
- PA to Registrar
- Notification File





**UNIVERSITY OF SARGODHA**  
**Faculty of Pharmacy, College of Pharmacy**

**1. Nomenclature of the Programs:**

- Master of Philosophy in Pharmaceutical Chemistry (M.Phil. Pharmaceutical Chemistry)

**2. Department Brief:**


The College of Pharmacy, Faculty of Pharmacy, is offering postgraduate programs in various disciplines of Pharmacy. Master of Philosophy in Pharmaceutical chemistry is one of major field of the Pharmaceutical Research. Pharmaceutical chemistry program enables the students to understand the basis of analytical chemistry, medicinal chemistry, phytochemistry and structure based drug's activity relationships, Development and innovations in drug discovery, design and development.

**3. Program Structure:**

<b>Duration</b>	Minimum 2-Years (4-Semesters), Maximum 4-Years (8-Semesters)		
<b>Entry Requirements:</b>	Candidates having minimum 2 <sup>nd</sup> division in annual system or CGPA 2.0/4.0 in Pharm.D. or B.Pharm. degree in semester system /annual system from HEC recognized Institutions. Departmental Test (50% qualifying marks)		
<b>Intra and Inter-disciplinary fields allowed for admission</b>	<i>Intra disciplinary admissions are allowed only for Pharm.D. graduates as per PCP policy</i>		
<b>Degree Completion Requirements:</b>	Total Credit Hours of Course Work:	26	
	Total Credit Hours of research and Thesis:	06	
	Total Credit Hours of Program:	32	
<b>Program Mode (select one)</b>	Thesis Track		

**4. List of Deficiency Courses of Level-6: (*Intra-disciplinary deficiency courses are not required as per uniform syllabus and policy of the council. Inter-disciplinary admissions are being offered in this field*)**

Sr. No.	Course Code	Course Title	Credit Hours	Prerequisite
1	N/A	N/A	N/A	N/A

  
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**5. List of Mandatory/Compulsory/Core Courses for Semester 1:**

Sr. No.	Course Code	Course Title	Credit Hours	Prerequisite
1.	PHRM-7401	Biostatistics	3(3-0)	Enrollment as per regulations of the University and PCP
2.	PHRM-7402	Drug design and development	3(3-0)	--do--
3.	PHRM-7403	Pharmaceutical Analytical Techniques	3(3-0)	--do--
4.	PHRM-7404	Research Methodology	3(3-0)	--do--
5.	URCG-5129	Understanding of Holy Quran / Fehm-e-Quran-I / Ethics-I	1(1-0)	--do--

**6. List of Mandatory/Compulsory/Core Courses for Semester 2:**

Sr. No.	Course Code	Course Title	Credit Hours	Prerequisite
1.	PHRM-7405	Advanced Medicinal Chemistry	3(3-0)	Enrollment as per regulations of the University and PCP
2.	PHRM-7406	Natural Product Chemistry	3(3-0)	--do--
3.	PHRM-7407	Phytochemistry	3(3-0)	--do--
4.	PHRM-7408	Therapeutical Chemistry	3(3-0)	--do--
5.	URCG-5130	Understanding of Holy Quran / Fehm-e-Quran-II / Ethics-II	1(1-0)	--do--



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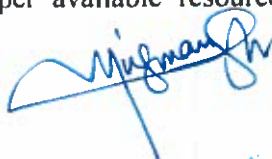
## Scheme of Studies

### Master of philosophy in Pharmaceutical Chemistry

Course Code	Course Title	Credit Hour
<b>SEMESTER-1</b>		
PHRM-7401	Biostatistics	3 (3-0)
PHRM-7402	Drug design and development	3 (3-0)
PHRM-7403	Pharmaceutical Analytical Techniques	3 (3-0)
PHRM-7404	Research Methodology	3 (3-0)
URCG-5129	Understanding of Holy Quran / Fehm-e-Quran-I / Ethics-I	1(1-0) ✓
<b>Total Credit Hours in Semester-1</b>		<b>13</b>
<b>SEMESTER-2</b>		
PHRM-7405	Advanced Medical Chemistry	3 (3-0)
PHRM-7406	Natural Product Chemistry	3 (3-0)
PHRM-7407	Phytochemistry	3 (3-0)
PHRM-7408	Therapeutical Chemistry	3 (3-0)
URCG-5130	Understanding of Holy Quran / Fehm-e-Quran-II / Ethics-II	1(1-0) ✓
<b>Total Credit Hours in Semester-2</b>		<b>13</b>
<b>SEMESTER-3 to 4</b>		
PHRM-7409	Research & Thesis	06

**Note:**

1. The Regulations related to MS/M.Phil./M.Sc.(Hons) or equivalent approved by the Syndicate from time to time shall also be applicable.
2. Deficiency Courses are to be decided by Graduate Program Committee in start of each session.
3. Department can change the order of Core/Compulsory and Elective Courses as per availability of resources or demand.
4. Department can change the course offering as per available resources but shall be uniform for one session.

  
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## **FIRST SEMESTER (M.Phil. Pharmaceutical Chemistry)**

### **PHRM-7401 BIostatistics**

**Cr. Hr. 03**

1. Introduction and applications to Biological and Pharmaceutical Sciences. Samples and Population, Various Types of Sampling.
2. Measures of Central Tendencies and Dispersion, Arithmetic mean, standard deviation, Standard error of the mean, Median, Mode, Range, Variance
3. Test of Hypothesis and Significance: Chi-square, Student 't' and 'F' distribution and their Testing. Analysis of Variance (ANOVA), its classification. P-value and LSD tests.
4. Statistical Analysis and Interpretation of Data with various software
5. Experimental Designs & their Significance: (Advantages & Disadvantages), their Principles Completely Randomized Complete Block Designs (RCB-designs), Latin square Designs (LS-Designs), Computer Methods of Statistical Evaluation.
6. Correlation / Regression Analysis
7. Statistical approaches in developing formulations.
8. Software: Uses of software like GraphPad prism, referencing software like Endnote, Zotero and Mendeley, Microsoft Excel, Analysis of data using the above software

#### Recommended Books:

1. Daniel WW. Bio-Statistics: Foundation for Analysis in Health Science. 9th Ed. Wiley Publishers; 2009.
2. Nilton JS. Statistical Methods in Biological and health Sciences. 3rd Ed. McGraw Hill; 1998.
3. Hoel PG, Port SC, Stone CJ. Introduction to Statistical Theory. 1st Ed. Brooks Cole; 1972.
4. Samuels M. Statistics for the life sciences. 3rd Ed. Dellen Publishers co; 2002. 5. Zar JH. Biostatistical analysis. 4th Ed. Francis Hal
5. Stanton, A.G (2001) Primer of Biostatistics. McGraw Hill, New York, USA
6. Lev Dykman. Principles of Biostatistics. 2<sup>nd</sup> Ed. CRC press; 2018.

### **PHRM-7402 DRUG DESIGN AND DEVELOPMENT**

**Cr. Hr. 03**

1. Drug design and development principles and applications
2. Introduction and approaches of Drug discovery, design and development process (steps involved and structure)
3. Molecular modeling techniques in drug design
4. Drug design to Biological Evaluations (including Clinical trials)
5. Computer-aided drug design (CADD), CADD with Artificial Intelligence (AI), Machine Learning (ML) and Deep Learning (DL) Technologies
6. Latest trends in drug discovery, design and development (students will explore through latest research articles). Synthetic methods & techniques in combinatorial synthesis, Screening methods in combinatorial chemistry
7. Principles of computational chemistry in drug design,

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Recommended Books:

1. Textbook of Drug Design and Discovery, Edited by Kristian Stromgaard, Povl Krogsgaard-Larsen, Ulf Madsen, 5th Edition. CRC Press. 2016.
2. Basic Principles of Drug Discovery and Development, Benjamin E. Blass, Academic Press, 2015.
3. Modern methods of drug discovery, Alexander Hillisch, Rolf Hilgenfeld, Springer. 2023.
4. An Introduction to Medicinal Chemistry by Graham L. Patrick Oxford University Press. 2013.

**PHRM-7403 PHARMACEUTICAL ANALYTICAL TECHNIQUES Cr. Hr. 03**

Analytical techniques (listed below) must be discussed in view of evaluation requirement of drug delivery systems. Only necessary detail of the following techniques (Working Principle and Application) should be included to fulfill the conceptual requirement of the postgraduate students.

1. UV-Visible spectroscopy: Principles and working phenomenon in relation to analysis of pharmaceutical materials.
2. 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
3. Thermal Analysis Techniques: (1) Thermogravimetry (TGA), (2) differential scanning calorimetry (DSC), (3) Differential thermal analysis (DTA).
4. Mass Spectroscopy: Principle, Theory, Instrumentation of Mass Spectroscopy, Different types of ionization.
5. 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.
6. Chromatography: Principle, apparatus, instrumentation, chromatographic parameters, factors affecting resolution and applications of the following: High Performance Liquid chromatography (HPLC), Ultra performance Liquid Chromatography (UPLC), Liquid Chromatography Mass Spectrometry (LCMS), Gas chromatography.
7. NMR spectroscopy: Principle, Instrumentation, types and its applications
8. Miscellaneous techniques; PCR, Elisa and other latest techniques.

Recommended Books:

1. Ahu Ahuja S, Scypinski S. Handbook of modern pharmaceutical analysis. 2nd Ed. Academic Press; 2010
2. Judith Baker. Current Research in drug testing and Analysis. 1<sup>st</sup> Ed. Syrawood Publishing; 2016.
3. Beckett AH, Stennlake JB. Practical Pharmaceutical Chemistry. 4th Ed. The Aulton Press; 2001.
4. Brittain HG. Spectroscopy of pharmaceutical solids. 1st Ed. Taylor & Francis; 2006.
5. Heftmann E. Chromatography. 6th Ed. Von Nostrand Reinhold Co; 2004
6. Kazakevich Y, LoBrutto R. HPLC for pharmaceutical scientists. 1st Ed. John Wiley and Sons; 2007.

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7. Snyder LR, Kirkland JJ, Dolan JW. Introduction to modern liquid chromatography. 3rd Ed. John Wiley & Sons Inc; 2009.
8. Gregory K. Webster. Chromatographic methods development. 1<sup>st</sup> Ed. Jenny Stanford.; 2020.

<b>PHRM-7404</b>	<b>RESEARCH METHODOLOGY</b>	<b>Cr. Hr. 03</b>
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1. Principles and theory of Research, Research Methods: Concepts and Fundamentals
2. Research ethics and ethical approval process
3. Research Proposal/Synopsis: Introduction, preparation and presentation
4. Literature Survey/Review: Basics & types, Literature review methods, Introduction to various Pharmaceutical Journals, Data bases, Journals ranking
5. Writing techniques of Thesis/Dissertation
6. Paper writing and publishing the paper, all components of thesis writing, Conflict of interest
7. Referencing: Introduction, referencing types/styles and methods. Reference tools/software (Endnote: Introduction & its practical application).

**Recommended Books**

1. Shyama PM, A Guide to Research Methodology, 1<sup>st</sup> Edition CRC Press; 2019
2. Mukherjee S, A Guide to Research Methodology: An Overview of Research Problems, Tasks and Methods CRC Press, 2020
3. Prabhat P, Research Methodology: Tools And Techniques, Bridge Center; 2015
4. Vogel, Hans Gerhard (2008). Drug Discovery and Evaluation: Pharmacological Assays. Springer-Verlag Berlin Heidelberg. 3<sup>rd</sup> edition.

## **SECOND SEMESTER (M.Phil. Pharmaceutical Chemistry)**

<b>PHRM-7405</b>	<b>ADVANCED MEDICINAL CHEMISTRY</b>	<b>Cr. Hr. 03</b>
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1. Medicines of plant origin: historical development.
2. Metabolic changes of drug and related organic compounds.
3. Biopharmaceutical properties of drug substances.
4. Principles of computational chemistry in drug design
5. Pharmaceutical biotechnology
6. Natural fungi toxins

**Recommended Books:**

1. Burger A. Medicinal Chemistry. 6 th Ed. Jhon Willey & Sons 2003.
2. Foye WO. Principles of Medicinal Chemistry. 6 th Ed Verghese Publishing House: 2008.
3. Gennaro AR. Remington: The science and practice of pharmacy. 21 st Ed. Lippincott William & Williams & Wilkins 2011.
4. Tyagi OD. Yadav M. Textbook of Synthetic Drugs. 3 rd Ed. Anmol Publication: 2004.

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1. Modification of natural substances in the modern drug synthesis.
2. New approaches to the discovery of antitumor agents.
3. Recent developments in the chemistry distribution Plant derived anticancer agents.
4. Recent developments in the chemistry distribution and biology of the cyanogenetic glycosides.
5. Natural products for liver diseases.
6. Chemistry and biological activity of Saponins.
7. Non-steroid, cardioactive plant constituents.
8. Immuno-stimulants from higher plants
9. Potential fertility regulating agents from plants.


**Recommended Books:**

1. Monographs of Unani Medicine. Hamdard Foundation Pakistan: 2003
2. Baker BM, Bender DA. Vitamins in Medicine. 12th Ed. Academic Press 1982.
3. Brain KR, Turner TD. The Practical Evaluation of Phytopharmaceuticals. 1 st Ed. ScientechnicaPublishers: 1975.
4. Braun L, Cohen M. Herbs and Natural Supplements: An Evidence Based Guide, 3 rd Ed. London:Elsevier Mosby: 2010.
5. V.K Gupta et al. Medicinal Plants: Phytochemistry, Pharmacology and Therapeutics. 2<sup>nd</sup> Volume. Daya publishing. 2012

1. Cell culture as sources of drugs
2. Methods used in high throughput screening of secondary metabolites
3. Prostaglandin synthetize inhibitors: A new approach for insect control.
4. Basic metabolic pathways and origin of secondary metabolites
5. Antifungal, Mullusciaidal and Cytotoxic compounds from plants used in traditional medicine
6. Natural polypeptides, polysaccharides and beta-lactam antibiotics

**Recommended Books:**

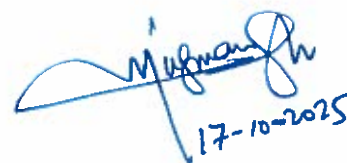
1. Monographs of Unani Medicine. Hamdard Foundation Pakistan: 2003.
2. Baker BM, Bender DA. Vitamins in Medicine. 12<sup>th</sup> Ed. Academic Press 1982.
3. Brain KR, Turner TD, The Practical Evaluation of Phytopharmaceuticals 1<sup>st</sup> Ed. ScientechnicaPublishers: 1975.
4. Braun L, Cohen M Herbs and Natural Supplements: An Evidence Based Guide. 3 rd Ed. London:Elsevier Mosby: 2010.
5. Mayuri Napagoda, Lalith Jayasinghe. Chemistry of Natural Products: Phytochemistry and Pharmacognosy of Medicinal Plants. 1<sup>st</sup> Ed. Walter de Gruyter GmbH & Co KG, 2022.

  
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1. Structure-activity relationships of organic medicinal compound including antimalarial, sedatives & hypnotics, cardiac steroids, diuretics, Morphine and related compounds,
2. Medicinal Chemistry, synthesis, SAR and therapeutical Application of Antibacterial drugs
3. Stereochemistry of selected drugs in relation to the mechanism of action
4. Receptor theories
5. Antihyperlipidemic drugs. Drugs affecting sugar metabolism and Non-Steroidal Anti-inflammatory drugs
6. Radiosensitizers
7. Anti-amoebic agents, antiviral and anti-cancer drugs

#### Recommended Books

1. Burger A. Medicinal Chemistry. 6 th Ed. Jhon Willey & Sons: 2003.
2. Block GH, Roche EB, Soine TO, Wilson, Inorganic and Medicinal Pharmaceutical Chemistry, 2<sup>nd</sup> Ed. Verghese Publishing House: 1986.
3. Block JH, Beals JM. Wilson and Gisvold's textbook of organic medicinal and Pharmaceutical chemistry 12<sup>th</sup> Ed, Lippincott Williams & Wilkins 2010.
4. David E. Thurston. Chemistry and Pharmacology of Anticancer Drugs. 2<sup>nd</sup> Ed. CRC Press, 2021
5. Thomas Haldane. Medicinal Chemistry. 1<sup>st</sup> Ed. Syrawood Publisher. 2016



17-10-2025

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