

LAHORE COLLEGE FOR WOMEN UNIVERSITY, LAHORE
CHEMISTRY DEPARTMENT

New BS (4-Year) Degree Program in Chemistry
2023-2027 and onwards

Year-I

Semester-I

Course Code	Course Title	Credit Hours
To be provided by the examination department	Functional English	3
To be provided by the examination department	Islamic Studies	2
To be provided by the examination department	Application of Information and Communication Technologies	2
To be provided by the examination department	Application of Information and Communication Technologies Practical	1
Maj/Chem-101	Physical Chemistry-I	3
Maj/Chem-101P	Physical Chemistry-I Practical	1
Maj/Chem-102	Inorganic Chemistry-I	2
Maj/Chem-102P	Inorganic Chemistry-I Practical	1
Total Credit Hours		15

Semester-II

Course Code	Course Title	Credit Hours
To be provided by the examination department	Expository English	3

To be provided by the examination department	Ideology and Constitution of Pakistan	2
To be provided by the examination department	Quantitative Reasoning-1	3
To be provided by the examination department	Physical Chemistry-II	2
To be provided by the examination department	Physical Chemistry-II Practical	1
To be provided by the examination department	Organic Chemistry-I	3
To be provided by the examination department	Organic Chemistry-I Practical	1
Total Credit Hours		15

Year-II

Semester-III

Course Code	Course Title	Credit Hours
To be provided by the examination department	Social Sciences	2
To be provided by the examination department	Natural Sciences	2
To be provided by the examination department	Natural Sciences Practical	1
To be provided by the examination department	Quantitative Reasoning-2	3
To be provided by the examination department	Organic Chemistry-II	2
To be provided by the examination department	Organic Chemistry-II Practical	1
To be provided by the examination department	Inorganic Chemistry-II	3

To be provided by the examination department	Inorganic Chemistry-II Practical	1
Total Credit Hours		15

Semester-IV

Course Code	Course Title	Credit Hours
To be provided by the examination department	Arts and Humanities	2
To be provided by the examination department	Entrepreneurship	2
To be provided by the examination department	Civics and Community Engagement	2
To be provided by the examination department	Inorganic Chemistry-III	2
To be provided by the examination department	Inorganic Chemistry-III Practical	1
To be provided by the examination department	Organic Chemistry-III	2
To be provided by the examination department	Organic Chemistry-III Practical	1
To be provided by the examination department	Physical Chemistry-III	2
To be provided by the examination department	Physical Chemistry-III Practical	1
Total Credit Hours		15

Year-III

Semester-V

Course Code	Course Title	Credit Hours
Maj/Chem-301	Physical Chemistry-IV	2
Maj/Chem-301P	Physical Chemistry-IV Practical	1
Maj/Chem-302	Inorganic Chemistry-IV	2
Maj/Chem-302P	Inorganic Chemistry-IV Practical	1
Maj/Chem-303	Organic Chemistry-IV	2
Maj/Chem-303P	Organic Chemistry-IV Practical	1
Maj/Chem-304 Or Maj/Chem-305	Analytical Chemistry -I Or *Applied Chemistry-I	2
Maj/Chem-306 Or Maj/Chem-307	Biochemistry-I Or *Introduction to Food Chemistry	2
To be provided by the examination department	Inferential Statistics	3
EC / Math-301	Basic Mathematics for Chemistry	2
Total Credit Hours		18

*As per availability of resources

Semester VI

Course Code.	Course Title	Credit Hours
Maj/Chem-308	Physical Chemistry-V	2
Maj/Chem-308P	Physical Chemistry-V Practical	1
Maj/Chem-309	Inorganic Chemistry-V	3
Maj/Chem-309P	Inorganic Chemistry-V Practical	1

Maj/Chem-310	Organic Chemistry-V	2
Maj/Chem-310P	Organic Chemistry-V Practical	1
Maj/Chem-311 Or Maj/Chem-312	Analytical Chemistry-II Or *Applied Chemistry-II	2
Maj/Chem-313 Or Maj/Chem-314	Biochemistry-II Or *Food Chemistry	2
EC / ES-301	Introduction to Environmental Sciences	2
Total Credit Hours		16

*As per availability of resources

Year-IV

Semester-VII

Course Code	Course Title	Credit Hours	
Maj/Chem-	Specialization Course 01	3	Any combination of Physical, Organic, Inorganic, Biochemistry, Analytical, Applied or Food Chemistry mentioned below.
Maj/Chem-	Specialization Course 02	3	
Maj/Chem-	Specialization Course 03	3	
-	Nanoscience	3	
Maj / Chem-315	Research Methodology	2	
-	*Internship/Field experience	3	
Total Credit Hours		17	

***6-8 weeks of Internship/Field experience will be conducted in summer break between 6th and 7th semester. Its marks will be credited in 7th semester.**

Semester-VIII

Course Code	Course Title	Credit Hours	
Maj/Chem-	Specialization Course 04	3	Any combination of Physical, Organic, Inorganic, Biochemistry, Analytical, Applied or Food Chemistry mentioned below.*
	Specialization Course 05	3	
	Specialization Course 06	3	
	Specialization Course 07	3	
To be provided by the examination department	Capstone Project	3	
Total Credit Hours		15	

*Student shall choose any one of the following specializations as per availability of resources.

Specialization Option 01 (Physical Chemistry)

Semester 7		
Course Code	Course Title	Credit Hours
Maj/Chem-401	Statistical Thermodynamics and Electrochemistry	3
Maj/Chem-402	Polymer Chemistry	3
Maj/Chem-403	Quantum Chemistry and Molecular Spectroscopy	3
Semester 8		
Maj / Chem-429	Chemical Kinetics	3
Maj / Chem-430	Photochemistry and Radiation Chemistry	3
Maj / Chem-431	Solid State and Surface Chemistry	3
Maj/Chem-404	Practicals in Physical Chemistry	3

Specialization Option 02 (Inorganic Chemistry)

Semester 7		
Maj/Chem-405	Theoretical Inorganic Chemistry	3
Maj/Chem-406	Characterization Techniques for Inorganic Compounds	3
Maj/Chem-407	Organometallics	3
Semester 8		
Maj / Chem-432	Organic Reagents and Homogenous Catalysis	3
Maj / Chem-433	Inorganic Polymers and Materials Chemistry	3
Maj / Chem-434	Nuclear and Magneto Chemistry	3
Maj/Chem-408	Practicals in Inorganic Chemistry	3

Specialization Option 03 (Organic Chemistry)

Semester 7		
Maj/Chem-409	Structure Elucidation of Natural Products	3
Maj/Chem-410	Organic Synthesis	3
Maj/Chem-411	Name Reactions	3
Semester 8		
Maj / Chem-435	Heterocyclic Chemistry	3
Maj / Chem-436	Molecular Rearrangements and Organic Polymers	3
Maj / Chem-437	Medicinal Chemistry	3
Maj/Chem-412	Practicals in Organic Chemistry	3

Specialization Option 04 (Analytical Chemistry)

Semester 7		
Maj/Chem-413	Spectroscopic Methods of Analysis	3
Maj/Chem-414	Electrochemical Techniques	3
Maj/Chem-415	Nuclear Techniques	3
Semester 8		
Maj / Chem-438	Hyphenated Techniques	3
Maj / Chem-439	Advance Chromatography	3
Maj / Chem-440	Thermal Method of analysis	3
Maj/Chem-416	Practicals in Analytical Chemistry	3

OR

Specialization Option 05 (Biochemistry)

Semester 7		
Maj/Chem-417	Endocrinology and Blood Chemistry	3
Maj/Chem-418	Biochemical Techniques	3
Maj/Chem-419	Molecular Biology	3
Semester 8		
Maj / Chem-441	Physiological Chemistry and Chemotherapy	3
Maj / Chem-442	Microbiology and Immunology	3
Maj / Chem-443	Nutrition	3
Maj/Chem-420	Practicals in Biochemistry	3

Specialization Option 06 (Applied Chemistry)

Semester 7		
Maj / Chem-421	Common Industries-I	3
Maj / Chem-422	Agro-based Industries and pollution control	3
Maj / Chem-423	Common Industries-II	3

Semester 8		
Maj / Chem-444	Organic Based Industries	3
Maj / Chem-445	Industrial Processes	3
Maj / Chem-446	Metallurgy and Explosives	3
Maj/Chem-424	Practicals in Biochemistry	3

OR

Specialization Option 07 (Food Chemistry)

Semester 7		
Maj / Chem-425	Principles of Human Nutrition	3
Maj / Chem-426	Food processing, preservation and packing	3
Maj / Chem-427	Food toxicology and safety	3
Semester 8		
Maj / Chem-447	Instrumental techniques in food analysis	3
Maj / Chem-448	Community Nutrition	3
Maj / Chem-449	Food Quality and Management	3
Maj/Chem-428	Practicals in Food Chemistry	3

Credit Hours Distribution

General Courses: 30

Allied Courses: 12

Major Chemistry Courses: 78

Internship/Field Experience: 3

Capstone Project: 3

Grand Total Credit Hours: 126

Minor in Chemistry

Students who opt to study chemistry as a minor will be offered the following courses subject to availability of resources.

Course Code	Course Title	Credit Hours
Min/Chem-101	General Inorganic Chemistry	3
Min/Chem-101P	General Inorganic Chemistry	1
Min/Chem-102	Physico-Organic Chemistry-I	3
Min/Chem-102P	Physico-Organic Chemistry-I Practical	1
Min/Chem-201	Physico-Organic Chemistry-II	3
Min/Chem-201P	Physico-Organic Chemistry-II (Practical)	1
Total Credit Hours		12

BS Chemistry with 1 or 2 Minors:

Students of BS Chemistry may opt one or two of the following minors as per availability of resources and offering of concerned department.

- Minor in Botany
- Minor in Zoology
- Minor in Physics
- Minor in Biotechnology