

Semester Breakup

Semester-I

SN	Course Code	Course Title	Credit Hours
1	ENGL1114	Functional English	3 (3+0)
2	ISLA1111/ HUMN1111	Islamic Studies / Ethics**	2 (2+0)
3	EDUC3111	Foundations of Education	3 (3+0)
4*	BOTN1111	Diversity of Plants	4 (3+1)
	PHYS1111	Mechanics-I	4 (3+1)
5*	ZOOL1111	Principles of Animal Life-I	4 (3+1)
	MATH1111	Calculus-I	3 (3+0)
6	CHEM1111	Fundamentals of Inorganic Chemistry	4 (3+0)
* Student may opt any one course			
** For non-Muslim Students			

Semester-II

SN	Course Code	Course Title	Credit Hours
1	ENGL1119	Communication Skills	3 (3+0)
2	PAKS1111	Pakistan Studies	2 (2+0)
3	EDUC1112	General Methods of Teaching	3 (3+0)
4*	BOTN1112	Plant Systematics, Anatomy and Development	4 (3+1)
	PHYS1114	Mechanics-II	4 (3+1)
5*	ZOOL1112	Principles of Animal Life-II	4 (3+1)
	MATH1112	Calculus- II	3 (3+0)
6	CHEM1113	Fundamentals of Organic Chemistry	4 (3+0)
* Student may opt any one course			

Six Credit Hours (Non-credited) Teaching Practice is mandatory to fulfill degree requirement. It will comprise of 3 weeks and it will be conducted twice, i.e., before start of 3rd and 5th semester. It will have 3 credit hours (each time) for teaching / evaluation purpose; however, it will be reflected as non-credited course on the Transcript of 3rd and 5th semester.

Semester-III

SN	Course Code	Course Title	Credit Hours
1	ENGL2115	Technical Writing and Presentation Skills	3 (3+0)
2	EDUC3143	Educational Assessment	3 (3+0)
3*	BOTN2111	Cell Biology, Genetics and Evolution	4 (3+1)
	PHYS2111	Electricity and Magnetism-I	4 (3+1)
4*	ZOOL2111	Animal Diversity-I	4 (3+1)
	MATH2111	Calculus- III	3 (3+0)
5	CHEM2111	Environmental Chemistry	3 (3+0)
6	CHEM1112	Fundamentals of Physical Chemistry	4 (3+1)
7	EDUC2127	Short Term Teaching Practice-I	Non Credit
* Student may opt any one course			

Semester-IV

SN	Course Code	Course Title	Credit Hours
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1	COMP1111	Introduction to Information Technology	3 (3+0)
2	STAT2111	Introduction to Statistics and Probability	3 (3+0)
3	EDUC2118	Curriculum Design and Instruction	3 (3+0)
4	CHEM2112	Analytical Chemistry	4 (3+1)
5	CHEM2113	Industrial Chemistry	3 (3+0)
6	CHEM2114	Introduction to Biochemistry	3 (3+0)

Six Credit Hours (Non-credited) Teaching Practice is mandatory to fulfill degree requirement. It will comprise of 3 weeks and it will be conducted twice, i.e., before start of 3rd and 5th semester. It will have 3 credit hours (each time) for teaching / evaluation purpose; however, it will be reflected as non-credited course on the Transcript of 3rd and 5th semester.

Semester-V

SN	Course Code	Course Title	Credit Hours
1	MATH3116	Mathematics for Chemist	2 (2+0)
2	CHEM3111	Chemistry of Transition Elements	4 (3+1)
3	CHEM3112	Stereochemistry and Reaction Mechanism	4 (3+1)
4	CHEM3113	Quantum Chemistry and Gas Phase Equilibrium	4 (3+1)
5	CHEM3114	Advanced Analytical Chemistry	4 (3+1)
6	EDUC3160	Short Term Teaching Practice II	Non Credit

Semester-VI

SN	Course Code	Course Title	Credit Hours
1	CHEM3115	Inorganic Material Chemistry	4 (3+1)
2	CHEM3116	Organic Reaction Mechanisms	4 (3+1)
3	CHEM3117	Advanced Physical Chemistry	4 (3+1)
4*	CHEM3118	Applied Chemistry	4 (3+1)
	CHEM3119	Biometabolism	4 (3+1)
	CHEM3120	Fuel Chemistry	4 (3+1)

* Student may opt any one course

Semester-VII

Specialization in Inorganic Chemistry			
SN	Course Code	Course Title	Credit Hours
1	CHEM4111	Inorganic Reaction Mechanism	4 (3+1)
2	CHEM4113	Pi-Acceptor Ligands and Polymers	3 (3+0)
3	CHEM4115	Inorganic Spectroscopy	3 (3+0)
4	CHEM4XXX	Elective- I (other than the field of specialization)	3 (3+0)
5	CHEM4XXX	Elective - II (other than the field of specialization)	3 (3+0)
Specialization in Organic Chemistry			
SN	Course Code	Course Title	Credit Hours
1	CHEM4112	Heterocyclic and Organometallics	4 (3+1)
2	CHEM4114	Reactive Intermediates	3 (3+0)
3	CHEM4116	Organic Spectroscopy	3 (3+0)
4	CHEM4XXX	Elective- I (other than the field of specialization)	3 (3+0)
5	CHEM4XXX	Elective - II (other than the field of specialization)	3 (3+0)
Specialization in Analytical Chemistry			

SN	Course Code	Course Title	Credit Hours
1	CHEM4125	Atomic Spectrophotometry	4 (3+1)
2	CHEM4126	Electroanalytical Techniques	3 (3+0)
3	CHEM4127	Advanced Separation Techniques	3 (3+0)
4	CHEM4XXX	Elective - I (other than the field of specialization)	3 (3+0)
5	CHEM4XXX	Elective - II (other than the field of specialization)	3 (3+0)
Specialization in Applied Chemistry			
SN	Course Code	Course Title	Credit Hours
1	CHEM4131	Common Industries- I	4 (3+1)
2	CHEM4132	Agro Based Industries and Pollution Control	3 (3+0)
3	CHEM4133	Common Industries –II	3 (3+0)
4	CHEM4XXX	Elective - I (other than the field of specialization)	3 (3+0)
5	CHEM4XXX	Elective - II (other than the field of specialization)	3 (3+0)
Specialization in Biochemistry			
SN	Course Code	Course Title	Credit Hours
1	CHEM4137	Biomedical Chemistry	4 (3+1)
2	CHEM4138	Nucleic Acid and Protein Synthesis	3 (3+0)
3	CHEM4139	Physical Techniques in Biochemistry	3 (3+0)
4	CHEM4XXX	Elective - I (other than the field of specialization)	3 (3+0)
5	CHEM4XXX	Elective - II (other than the field of specialization)	3 (3+0)
Specialization in Physical Chemistry			
SN	Course Code	Course Title	Credit Hours
1	CHEM4143	Electrochemistry and Statistical Thermodynamics	4 (3+1)
2	CHEM4144	Polymer Chemistry	3 (3+0)
3	CHEM4145	Quantum Chemistry and Molecular Spectroscopy	3 (3+0)
4	CHEM4XXX	Elective - I (other than the field of specialization)	3 (3+0)
5	CHEM4XXX	Elective - II (other than the area of specialization)	3 (3+0)
Specialization in Fuel Chemistry			
SN	Course Code	Course Title	Credit Hours
1	CHEM4149	Chemistry of Coal Conversion	4 (3+1)
2	CHEM4150	Petroleum and Petrochemicals-I	3 (3+0)
3	CHEM4151	Characterization of Fossil Fuels	3 (3+0)
4	CHEM4XXX	Elective - I (other than the field of specialization)	3 (3+0)
5	CHEM4XXX	Elective - II (other than the area of specialization)	3 (3+0)

Semester-VIII

Specialization in Inorganic Chemistry			
SN	Course Code	Course Title	Credit Hours
1	CHEM4118	Organometallics	3 (3+0)
2	CHEM4120	Symmetry and Magnetochemistry	3 (3+0)
3	CHEM4122	Radio and Nuclear Chemistry	3 (3+0)
4	CHEMXXXX	Special Paper - I (other than the field of specialization)	3 (3+0)
5	CHEM4117/	Thesis /	6 (0+6) /
	CHEMXXXX	Special Paper - II (other than the field of specialization)	3 (3+0)

Specialization in Organic Chemistry			
SN	Course Code	Course Title	Credit Hours
1	CHEM4119	Natural Products	3 (3+0)
2	CHEM4121	Organic Synthesis	3 (3+0)
3	CHEM4123	Medicinal Chemistry	3 (3+0)
4	CHEMXXXX	Special Paper - I (other than the field of specialization)	3 (3+0)
5	CHEM4117/	Thesis /	6 (0+6) /
	CHEMXXXX	Special Paper - II (other than the field of specialization)	3 (3+0)
Specialization in Analytical Chemistry			
SN	Course Code	Course Title	Credit Hours
1	CHEM4128	Luminescence Spectroscopy and Thermal Analysis	3 (3+0)
2	CHEM4129	Nuclear Analytical Techniques	3 (3+0)
3	CHEM4130	Food and Drug Analysis	3 (3+0)
4	CHEMXXXX	Special Paper - I (other than the field of specialization)	3 (3+0)
5	CHEM4117/	Thesis /	6 (0+6) /
	CHEMXXXX	Special Paper - II (other than the field of specialization)	3 (3+0)
Specialization in Applied Chemistry			
SN	Course Code	Course Title	Credit Hours
1	CHEM4134	Organic Based Industries	3 (3+0)
2	CHEM4135	Industrial Processes	3 (3+0)
3	CHEM4136	Metallurgy and Explosives	3 (3+0)
4	CHEMXXXX	Special Paper - I (other than the field of specialization)	3 (3+0)
5	CHEM4117/	Thesis /	6 (0+6) /
	CHEMXXXX	Special Paper - II (other than the field of specialization)	3 (3+0)
Specialization in Biochemistry			
SN	Course Code	Course Title	Credit Hours
1	CHEM4140	Microbiology and Immunology	3 (3+0)
2	CHEM4141	Bionanotechnology	3 (3+0)
3	CHEM4142	Nutritional Chemistry	3 (3+0)
4	CHEMXXXX	Special Paper - I (other than the field of specialization)	3 (3+0)
5	CHEM4117/	Thesis /	6 (0+6) /
	CHEMXXXX	Special Paper - II (other than the field of specialization)	3 (3+0)
Specialization in Physical Chemistry			
SN	Course Code	Course Title	Credit Hours
1	CHEM4146	Reaction Dynamics	3 (3+0)
2	CHEM4147	Radiation and Photochemistry	3 (3+0)

3	CHEM4148	Colloid and Surface Chemistry	3 (3+0)
4	CHEMXXXX	Special Paper - I (other than the field of specialization)	3 (3+0)
5	CHEM4117 /	Thesis /	6 (0+6) /
	CHEMXXXX	Special Paper - II (other than the field of specialization)	3 (3+0)

Specialization in Fuel Chemistry

SN	Course Code	Course Title	Credit Hours
1	CHEM4149	Coal Conversion Processes	3 (3+0)
2	CHEM4153	Petroleum and Petrochemicals-II	3 (3+0)
3	CHEM4154	Alternate Energy Resource	3 (3+0)
4	CHEMXXXX	Special Paper - I (other than the field of specialization)	3 (3+0)
5	CHEM4117 /	Thesis /	6 (0+6) /
	CHEMXXXX	Special Paper - II (other than the field of specialization)	3 (3+0)

Note:

- **Specialization:**

Students of semester VII & VIII may be divided into one or more group/s of specialization depending upon the Expertise, Faculty and Facilities available.

- **Elective Courses and Special Papers:**

Any of the Elective Course and Special Paper will be selected from Tables (A – G), other than area of specialization.

- **Start and Evaluation of Thesis:**

The Thesis (Research work) will start in Semester VII but the evaluation of Thesis will be carried out at the end of Semester VIII after viva-voce of student.

- **Industrial/Study Tour:**

Visit to any industry/organization in semester VII and/or VIII to understand the objectives and contents of industries/organizations and also laboratory management which is a good application of practical knowledge.