

Department of Chemistry

Chemistry really is everywhere, from internationally active chemical companies to the way your own body works. It contains subjects from almost all sciences: physics, biology, also pharmacy and medicine etc. which play a vital role in today's scientific world and focus on the chemical nature of matter. The department of chemistry, faculty of sciences, Sarhad University, Peshawar, offers an environment where the students can explore, discover and learn chemistry through practical as well as coursework.

The department maintains a pedagogical and didactic strength in the field of organic, inorganic, physical, biochemistry and analytical chemistry. The labs are well equipped to undertake conventional as well as instrumental analysis to combat the emerging challenges in all afore mentioned fields of chemical sciences. Higher Education Commission is mainly focusing on Research and Development which play a vital role in the socio-economic development, progress and prosperity of the country. The faculty has therefore, launched value added R & D Program (in the form of Research Reports) for the final semester students of chemistry. To achieve such goals high caliber and qualified (Ph.D) faculties have been inducted within the department.

The faculty is devoted to excellence in education, engaging students at the cutting edge of science, sharing expertise and has pursuit towards excellence in knowledge to enrich the local and international communities. The department also offers outstanding opportunities for the students to explore the exciting world of chemistry and develop communication and problem-solving skills needed for success in their careers, and personal growth.

The students are also encouraged to enhance their educational experiences beyond the classroom. Each student of the chemistry department is carefully molded and trained to face the challenges in their respective fields of specialization. The faculty of the department is well qualified to the level of M.Phil and Ph.D, most of who have obtained their training from renowned institutions at national and international levels, and are actively engaged in teaching and research in goal oriented fields of chemistry. In addition to M.Sc the department has launched M.Phil and Ph.D programs in all afore mention disciplines of Chemistry. Students have been enrolling for M.Phil (Fall-2014).

Programs Offered:

Bachelor of Science in Chemistry

Master of Science in Chemistry

Vision

The Department of Chemistry, the sole department of chemical sciences in private sector was established in year 2009 at Sarhad University of Science & IT, a highest ranked public university of KP. The department strives to be a nationally recognized model for educating and graduating students prepared to contribute for boosting up the socio economic growth of the country and to compete the ever-changing and globally emerging technologies of the 21 century. We also endeavor to contribute to a chemically literate society through teaching (with classrooms, labs, and research).

Mission

The mission of the Department of Chemistry is to advance the chemical sciences through educating graduate and postgraduate students by providing them with well-furnished classroom well equipped labs and state of the art equipment's. The department provides rigorous preparation of citizens whose career paths require expertise in chemistry.

In support of our mission the Chemistry Department faculty members are committed to:

1. To supervise and guide graduate & postgraduate students in undertaking their R& D projects.
2. Providing them with educational and research opportunities between chemistry and other fields of study.
3. Promote innovative curriculum and exposing students to advanced instrumentation and emerging technology.

Bachelor of Science in Chemistry

Minimum Duration : 8 Semesters, 4 Years
Maximum Duration : 16 Semesters, 8 Years
Minimum CGPA required to earn degree 2.00

Program Code 114
Number of Courses 43 + Research Project
Credit Hours 134

Program Objectives:

The four-year program is designed in accordance to guidelines set by HEC. The program is aimed at to make the students conversant with all branches of chemistry and will focus not only on the theoretical background of chemical sciences but also will pave way for conducting Research and its compilation in the form of Project Reports.

Program Outcomes:

After completion of the BS Chemistry program, students will have the capability to;

- Understand and apply the practical and theoretical knowledge related to all branches / disciplines of chemistry they have studies in the BS level.
- Independently undertake all the analytical assignments related to qualitative and quantitative assessments of samples of the minerals, ores, environmental etc., along with solution of trouble shootings.
- Carry out independently R&D on different projects as well as routine lab work whenever assigned to them.
- Utilize and work on various analytical modern and sophisticated Equipments and tools in labs and research institutes.
- To articulate thoughts and ideas through oral and written communication

Eligibility

Candidates with F.Sc or A-levels having equivalency certificate and at least 45% marks are eligible to apply.

Candidate need to pass an aptitude test/interview conducted by the University.

	Course Code	Course Title	Cr. Hrs.
SEMESTER ONE	ENG 100	Functional English	3-0
	IT 100	Introduction to Information Technology	2-0
	IT 101	Introduction to Information Technology Lab	0-1
	CH 150	Inorganic Chemistry-I	3-0
	CH 151	Inorganic Chemistry Lab-I	0-1
		General Elective-I	3-0
		General Elective-II	3-0
	BIO 100	General Biology-I OR	3-0
	MA 100	Basic Mathematics	3-0
	SEMESTER TWO	ENG 101	Basic Communication Skills
CH 160		Organic Chemistry-I	3-0
CH 161		Organic Chemistry Lab-I	0-1
ST 100		Bio Statistics	3-0
		General Elective-III	3-0
MA 101		Calculus & Analytical Geometry	3-0
GS 123		Islamic Studies (for Muslims) OR	2-0
GS 140		Values, Ethics & Society (for Non Muslims)	2-0
SEMESTER THREE	ENG 200	Technical Report Writing	2-0
	GS 200	Pakistan Studies	2-0
	CH 240	Environmental Chemistry-I	3-0
	CH 270	Physical Chemistry-I	3-0
	CH 271	Physical Chemistry Lab-I	0-1
		General Elective-IV	3-0
		General Elective-V	3-0

SEMESTER FOUR

Course Code	Course Title	Cr. Hrs.	16
ENG 201	Communication & Presentation Skills	2-0	
CH 210	Analytical Chemistry-I	2-0	
CH 220	Applied Chemistry-I	2-0	
CH 230	Bio Chemistry-I	2-0	
CH 280	Fuel Chemistry-I	2-0	
	General Elective-VI	3-0	
	General Elective-VII	3-0	

SEMESTER FIVE

Course Code	Course Title	Cr. Hrs.	16
CH 350	Inorganic Chemistry-II	3-0	
CH 351	Inorganic Chemistry Lab-II	0-1	
CH 360	Organic Chemistry-II	3-0	
CH 361	Organic Chemistry Lab-II	0-1	
CH 370	Physical Chemistry-II	3-0	
CH 371	Physical Chemistry Lab-II	0-1	
One of the following			
CH 311	Analytical Chemistry-II	3-0	
CH 312	Analytical Chemistry Lab- II	0-1	
CH 331	Bio Chemistry-II	3-0	
CH 332	Bio Chemistry Lab-II	0-1	
CH 321	Applied Chemistry-II	3-0	
CH 322	Applied Chemistry Lab-II	0-1	
CH 381	Fuel Chemistry-II	3-0	
CH 382	Fuel Chemistry Lab-II	0-1	

SEMESTER SIX

Course Code	Course Title	Cr. Hrs.	16
CH 352	Inorganic Chemistry-III	3-0	
CH 353	Inorganic Chemistry Lab-III	0-1	
CH 362	Organic Chemistry-III	3-0	
CH 363	Organic Chemistry Lab-III	0-1	
CH 372	Physical Chemistry-III	3-0	
CH 373	Physical Chemistry Lab-III	0-1	
One of the Following			
CH 313	Analytical Chemistry-III	3-0	
CH 314	Analytical Chemistry- Lab III	0-1	
CH 333	Bio Chemistry-III	3-0	
CH 334	Bio Chemistry Lab-III	0-1	
CH 323	Applied Chemistry-III	3-0	
CH 324	Applied Chemistry Lab-III	0-1	
CH 383	Fuel Chemistry-III	3-0	
CH 384	Fuel Chemistry Lab-III	0-1	

SEMESTER SEVEN

Course Code	Course Title	Cr. Hrs.	16
	Specialization Elective I	3-0	
	Specialization Elective II	3-0	
	Specialization Elective III	3-0	
	Specialization Practical I	0-1	
	Minor Elective I	3-0	
RES 490	Project Phase I	0-3	

SEMESTER EIGHT

Course Code	Course Title	Cr. Hrs.	16
	Specialization Elective IV	3-0	
	Specialization Elective V	3-0	
	Specialization Elective VI	3-0	
	Specialization Practical II	0-1	
	Minor Elective II	3-0	
RES 490	Project Phase - II	0-3	

"I had been a student of SUIT from 2012-2015 and in this short time the amount of things I learnt the experiences, the knowledge led me to become a better person. I cannot thank everyone enough for it, the staff, the environment provided by the fellow students, the H.O.D of our Department Prof. Dr. K. Khan.

It was a great experience and I am so glad to have been a part of this institution and all the credit to my brilliant score and the gold medal goes to this institution and my dedicated teachers."

*Shabana Dad, Alumna,
Chemistry Department*

General Electives

Course Code	Course Title	Cr. Hrs.
PSY 319	Psychology	3-0
CE 355	Environmental Management	3-0
SBE 303	Human Development and Learning	3-0
MGT 270	Entrepreneurship	3-0
FIN 230	Introductory Business Finance	3-0
GS 322	Sociology	3-0
BT 101	General Biotechnology I	3-0
GS 111	Physics-I	2-0
GS 112	Physics Lab-I	0-1
IT 212	Database Concepts	2-0
IT 213	Database Concepts Lab	0-1
MGT 106	Principles of Management	3-0
GS 302	Logic and Critical Thinking	3-0
EDU 339	Contemporary Social Issues	4-0
HR 332	Human Resource Management	3-0
ACC 121	Principles of Accounting	3-0
GS 250	Geo Informatics	3-0
BT 215	Microbiology	2-0
BT 216	Microbiology Lab	0-1
CS 116	Programing Fundamentals	2-0
CS 117	Programing Fundamentals Lab	0-1

Specialization Electives

Course Code	Course Title	Cr. Hrs.
CH 411	Analytical Chemistry Paper 1	3-0
CH 412	Analytical Chemistry Paper 2	3-0
CH 413	Analytical Chemistry Paper 3	3-0
CH 414	Analytical Chemistry Paper 4	3-0
CH 415	Analytical Chemistry Paper 5	3-0
CH 416	Analytical Chemistry Paper 6	3-0
CH 417	Analytical Chemistry Practical I	0-1
CH 418	Analytical Chemistry Practical II	0-1
CH 431	Bio Chemistry Paper 1	3-0
CH 432	Bio Chemistry Paper 2	3-0
CH 433	Bio Chemistry Paper 3	3-0
CH 434	Bio Chemistry Paper 4	3-0
CH 435	Bio Chemistry Paper 5	3-0
CH 436	Bio Chemistry Paper 6	3-0
CH 437	Bio Chemistry Practical I	0-1
CH 438	Bio Chemistry Practical II	0-1
CH 451	Inorganic Chemistry Paper 1	3-0
CH 452	Inorganic Chemistry Paper 2	3-0
CH 453	Inorganic Chemistry Paper 3	3-0
CH 454	Inorganic Chemistry Paper 4	3-0
CH 455	Inorganic Chemistry Paper 5	3-0
CH 456	Inorganic Chemistry Paper 6	3-0
CH 457	Inorganic Chemistry Practical I	0-1
CH 458	Inorganic Chemistry Practical II	0-1
CH 471	Physical Chemistry Paper 1	3-0
CH 472	Physical Chemistry Paper 2	3-0
CH 473	Physical Chemistry Paper 3	3-0
CH 474	Physical Chemistry Paper 4	3-0
CH 475	Physical Chemistry Paper 5	3-0
CH 476	Physical Chemistry Paper 6	3-0
CH 477	Physical Chemistry Practical I	0-1
CH 478	Physical Chemistry Practical II	0-1

I am indebted to the SUIIT for infusing my life with knowledge, discipline and high moral values.

At SUIIT, I found the staff very supportive and the teachers very cooperative, full of knowledge and motivation.

*Faiza Noreen, Alumnus,
Department of Chemistry*

The facility for teaching of any of the elective course will be arranged only if reasonable number of students opt for.

Master of Science in Chemistry

Minimum Duration : 4 Semesters, 2 Years
 Maximum Duration : 10 Semesters, 5 Years
 Minimum CGPA required to earn degree 2.00

Program Code 087
 Number of Courses 28 + Research Project
 Credit Hours 74

Program Objectives:

The M.Sc program has been designed to help achieve the highest possible standards of scholarship, teaching and research in Chemistry and Chemistry related disciplines. It also aims at creating awareness of the applications of Chemistry including its practical, social and economics aspects such as health, agriculture, industry and defense.

Program Outcomes:

- ▶ After completion of the M.Sc Chemistry program, students will have the capability to;
- ▶ Understand and apply the practical and theoretical knowledge related to all branches / disciplines of chemistry they have studies in the MSc level studies.
- ▶ Independently undertake all the analytical assignments related to qualitative and quantitative assessments of samples of the minerals, ores, environmental etc., along with solution of trouble shootings.
- ▶ Carry out independently R&D on different projects as well as routine lab work whenever assigned to them.
- ▶ Utilize and work on various analytical modern and sophisticated Equipments and tools in labs and research institutes.
- ▶ To articulate thoughts and ideas through oral and written communication

Eligibility

Candidate holding bachelor's degree with Chemistry as subject with at least 45% marks is eligible to apply. Candidates need to pass an entry test/interview conducted by the university.

SEMESTER ONE	Course Code	Course Title	Cr. Hrs. 19
	CH 305	Analytical Chemistry - I	3-0
	CH 306	Analytical Chemistry Lab - I	0-1
	CH 313	Inorganic Chemistry - I	3-0
	CH 315	Inorganic Chemistry Lab - I	0-1
	MA 100	Basic Mathematics	3-0
	CH 302	Physical Chemistry - I	3-0
	CH 303	Physical Chemistry Lab - I	0-1
	CH 307	Organic Chemistry - I	3-0
	CH 309	Organic Chemistry Lab - I	0-1
SEMESTER TWO	Course Code	Course Title	Cr. Hrs. 16
	CH 316	Inorganic Chemistry - II	3-0
	CH 317	Inorganic Chemistry Lab - II	0-1
	CH 321	Organic Chemistry - II	3-0
	CH 322	Organic Chemistry Lab -II	0-1
	CH 318	Analytical Chemistry-II	3-0
	CH 319	Analytical Chemistry Lab -II	0-1
	CH 323	Physical Chemistry-II	3-0
	CH 324	Physical Chemistry Lab -II	0-1
SEMESTER THREE	Course Code	Course Title	Cr. Hrs. 18
		Elective I	3-0
		Elective II	3-0
		Elective III	3-0
		Elective IV	3-0
		Elective V	3-0
		Elective Lab III	0-3

Master of Science in Chemistry

SEMESTER FOUR	Course Code	Course Title	Cr. Hrs.
		Elective VI	3-0
		Elective VII	3-0
		Elective VIII	3-0
		Elective IX	3-0
		Advance Lab	0-3
RES 490	Research Project	0-6	

Electives

Inorganic/Analytical Chemistry Specialization

Course Code	Course Title	Cr. Hrs.
CH 405	Instrumental methods	3-0
CH 421	Inorganic Chemistry in Biological System	3-0
CH 429	Inorganic Chemistry - IV	3-0
CH 437	Inorganic/Analytical Chemistry Laboratory -III	0-3
CH 407	Advance Analytical Chemistry	3-0
CH 423	Elementary Group Theory	3-0
CH 431	Inorganic Polymers	3-0
CH 425	Coordination Chemistry	3-0
CH 433	Industrial Chemistry	3-0
CH 418	Environmental Chemistry	3-0
CH 427	Inorganic Chemistry - III	3-0
CH 435	Nuclear and Radio Chemistry	3-0
CH 458	Advance Inorganic/Analytical Chemistry Laboratory -IV	0-3
CH 409	Chemical Crystallography	3-0
RES 490	Research Project	0-6

Inorganic/Analytical Chemistry Specialization

Course Code	Course Title	Cr. Hrs.
CH 415	Chemical Kinetics	3-0
CH 446	Statistical Mechanics	3-0
CH 313	Colloids and Surfactants	3-0
CH 458	Solution Chemistry	3-0
CH 442	Quantum Chemistry	3-0
CH 448	Nuclear and Radiation Chemistry	3-0
CH 462	Electrochemistry	3-0
CH 470	Photochemistry	3-0
CH 454	Molecular Spectroscopy	3-0

Organic Chemistry Specialization

Course Code	Course Title	Cr. Hrs.
CH 406	Chemistry of Heterocyclic Compound	3-0
CH 412	Special Organic Reactions	3-0
CH 422	Biochemistry	3-0
CH 438	Organic Chemistry Lab - III	0-3
CH 424	Reaction Mechanism	3-0
CH 414	Stereochemistry	3-0
CH 411	Name Reaction	3-0
CH 474	Advance Organic Chemistry Laboratory - IV	0-3
CH 408	Spectroscopic Methods in Organic Chemistry - I	3-0
CH 429	Retrorynthesis	3-0
CH 426	Introduction To Polymer Chemistry	3-0
CH 410	Chemistry of Natural Products	3-0
CH 418	Spectroscopic Methods in Organic Chemistry - II	3-0
CH 440	Quantum Organic Chemistry	3-0
RES 490	Research Project	0-6

Organic Chemistry Specialization

Course Code	Course Title	Cr. Hrs.
CH 450	Solid State Chemistry	3-0
CH 464	Polymer Chemistry	3-0
CH 439	Physical Chemistry Laboratory - III	0-3
CH 444	Chemical Thermodynamics	3-0
MA 226	Computer Aided Numerical Analysis	3-0
CH 460	Surface Chemistry	3-0
CH 472	Advance Physical Laboratory - IV	0-3
RES 490	Research Project	0-6

The facility for teaching of any of the elective course will be arranged only if reasonable number of students opt for.