

School of Basic Sciences: Bachelor of Science (Honours with Research) in Chemistry (4-years)

Year 1								
Semester-I								
S. No.	Category	Name of the Course						
			L	T	P	S	C	
1	Core	Fundamental of Chemistry I	3	1	0	0	4	
2	Core	Atomic Structure and Chemical Bonding	3	0	1	0	4	
3	AEC-1	English Proficiency I	0	0	2	0	2	
4	AEC-2	Today's Science, Tomorrow's World I	2	0	0	0	2	
5	MDC-1	Foundation of Programming	2	0	2	0	4	
6	GE	Minor / Interdisciplinary Elective I	-	-	-	-	4	
Total Credits								20
Semester-II								
S. No.	Category	Name of the Course						
			L	T	P	S	C	
1	Core	Fundamental of Chemistry II	3	0	1	0	4	
2	Core	Halogen and Oxygen Containing Functional Groups	3	0	1	0	4	
3	Core	Chemistry of Group Elements	3	0	1	0	4	
4	AEC-3	English Proficiency II	-	-	-	0	2	
5	VAC-1	Data and Digital Literacy	-	-	-	-	2	
6	GE	Minor / Interdisciplinary Elective II	-	-	-	0	4	
Total Credits								20
Year 2								
Semester-III								
S. No.	Category	Name of the Course						
			L	T	P	S	C	
1	Core	Physical and Biophysical Chemistry-I	3	0	1	0	4	
2	Core	Nitrogen Functional Groups and Heterocyclic Compounds	3	0	1	0	4	
3	Core	Bio-organic and Medicinal Chemistry	3	0	1	0	4	

4	VAC-2	AI and Cognitive Systems	-	-	-	-	2
5	SEC-1	Statistical Computing with R	1	0	2	0	3
6	Internship	Academic Internship	-	-	-	-	2
7	GE	Minor / Interdisciplinary Elective III	-	-	-	-	4
Total Credits							23
Semester-IV							
S. No.	Category	Name of the Course					
			L	T	P	S	C
1	Core	Physical and Biophysical Chemistry-II	3	0	1	0	4
2	Core	Concepts of Nanoscience and Nanotechnology	3	0	1	0	4
3	Core	Quantum Chemistry and Spectroscopy	3	0	1	0	4
4	VAC-3	Prompting and AI Tools	-	-	-	-	2
5	SEC-2	Choose From the Basket	-	-	-	0	3
6	MDC-2	Choose From the Basket	-	-	-	0	2
7	GE	Minor / Interdisciplinary Elective IV	-	-	-	0	4
Total Credits							23
Year 3							
Semester-V							
S. No.	Category	Name of the Course					
			L	T	P	S	C
1	Core	Co-ordination Chemistry	3	0	1	0	4
2	Core	Organometallic Chemistry	3	0	1	0	4
3	Elective	Specialization Elective 1	3	1	0	0	4
4	GE	Minor / Interdisciplinary Elective V	-	-	-	0	4
5	SEC-3	AI-Driven Data Visualisation and Storytelling	1	0	1	1	3
6	AEC-4	Today's Science, Tomorrow's World II	2	0	0	0	2
7	Internship	Academic/Research/Industry	-	-	-	-	2

Total Credits								23
Semester-VI								
S. No.	Category	Name of the Course						
			L	T	P	S	C	
1	Core	Organic Spectroscopy	3	0	1	0	4	
2	Elective	Specialization Elective -2	3	1	0	0	4	
3	Elective	Specialised Elective-3	-	-	-	0	4	
4	Elective	Specialised Elective-4	-	-	-	0	4	
5	GE	Minor / Interdisciplinary Elective VI	-	-	-	0	4	
6	MDC-3	Choose From the Basket	-	-	-	0	3	
Total Credits								23
Year 4								
Semester-VII								
S. No.	Category	Name of the Course						
			L	T	P	S	C	
1	Core	Advanced Analytical Chemistry	3	0	1	0	4	
2	Elective	Specialised Elective-5	-	-	-	0	4	
3	Elective	Specialised Elective-6	-	-	-	0	4	
4	GE	Minor / Interdisciplinary Elective VII	-	-	-	0	4	
5	GE	Minor / Interdisciplinary Elective VIII	-	-	-	0	4	
Total Credits								20
Semester-VIII								
S. No.	Category	Name of the Course						
			L	T	P	S	C	
1	Project	Dissertation					12	
Total Credits								12
Total Credit in 4Years= 164								

Discipline Specific Electives

Synthetic Chemistry Specialization						
S. No.	Category	Name of the Course				
			L	T	P	C
1.	Elective 1	Green Chemistry	3	1	0	4
2.		Catalysis in Synthesis	3	0	1	4
3.		Industrial Chemistry	3	1	0	4
4.	Elective 2	Solid State Chemistry	3	1	0	4
5.	Elective 3	Analytical Methods in Chemistry	3	0	1	4
6.		Organocatalysis and Biocatalysis	3	0	1	4
7.	Elective 4	Project	-	-	-	4
8.	Elective 5	Principles of Reaction Mechanisms and Stereochemistry	3	0	1	4
9.		Synthesis Strategies of Complex Organic Molecules	3	1	0	4
10.	Elective 6	Natural Products and Synthesis	3	0	1	4
11.		Retrosynthetic Analysis	3	0	1	4
12.		Medicinal Chemistry and Drug Design	3	1	0	4

Pure Chemistry Specialization						
S. No.	Category	Name of the Course				
			L	T	P	C
1.	Elective 1	Green Chemistry	3	1	0	4
2.		Catalysis in Synthesis	3	0	1	4
3.		Industrial Chemistry	3	1	0	4
4.	Elective 2	Solid State chemistry	3	1	0	4
5.	Elective 3	Analytical Methods in Chemistry	3	0	1	4
6.		Bio-organic Chemistry	3	1	0	4
7.	Elective 4	Project	-	-	-	4
8.	Elective 5	Polymer Chemistry	3	1	0	4
9.		Battery Technology	3	1	0	4
10.	Elective 6	Carbon Materials	3	1	0	4
11.		Computational chemistry	3	1	0	4

12.		Principles of Reaction Mechanisms and Stereochemistry	3	1	0	4
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Inorganic Chemistry Specialization						
S. No.	Category	Name of the Course				
			L	T	P	C
1.	Elective 1	Green Chemistry	3	1	0	4
2.		Catalysis in Synthesis	3	0	1	4
3.		Industrial Chemistry	3	1	0	4
4.	Elective 2	Solid State chemistry	3	1	0	4
5.	Elective 3	Analytical Methods in Chemistry	3	0	1	4
6.	Elective 4	Project	-	-	-	4
7.	Elective 5	Advanced Spectroscopic Techniques	3	1	0	4
8.		Inorganic Reaction Mechanisms	3	1	0	4
9.	Elective 6	Bio-inorganic Chemistry	3	1	0	4
10.		Chemistry of Lanthanide and Actinide	3	1	0	4
11.		Radio-chemistry and Applications	3	1	0	4

Nano Chemistry Specialization						
S. No.	Category	Name of the Course				
			L	T	P	C
1.	Elective 1	Green Chemistry	3	1	0	4
2.		Catalysis in Synthesis	3	0	1	4
3.		Industrial Chemistry	3	1	0	4
4.	Elective 2	Solid State chemistry	3	1	0	4
5.	Elective 3	Synthesis techniques of Nanomaterials	3	1	0	4
6.		Nano-Toxicology and Safety	3	1	0	4
7.	Elective 4	Project	-	-	-	4
8.	Elective 5	Characterization Techniques for Nanomaterials	3	0	1	4
9.		Nanomaterials in Energy Storage Devices	3	1	0	4
10.	Elective 6	Nanomaterials in Biomedical applications	3	1	0	4
11.		Nanomedicine and Drug Delivery	3	1	0	4

Multidisciplinary Courses (MDC)

S. No.	Category	Name of the Course	L	T	P	C
1	MDC-1	Foundation of Programming	2	0	2	4
2	MDC-2	Indian legal systems for sciences	2	0	0	2
3		Stock exchange	2	0	0	2
4	MDC-2	Machine learning	3	0	0	3
5	MDC-3	Environmental Toxicology and Society	3	0	0	3
6		Research Methodology	3	0	0	3

Value added Courses (VAC)

S. No.	Category	Name of the Course	L	T	P	C
1.	VAC-1	Data and Digital Literacy	-	-	-	2
2.	VAC-2	AI and Cognitive Systems	-	-	-	2

3	VAC-3	Prompting and AI Tools	-	-	-	2
4	VAC-4	IT Tools and Data Analytics	-	-	-	3
Skill Enhancement Courses (SEC)						
S. No.	Category	Name of the Course	L	T	P	C
1.	SEC-1	Statistical Computing with R	1	0	2	3
2.	SEC-1	Python for Scientific Computing	2	0	1	3
3.	SEC-2	Introduction to Artificial Intelligence	2	0	1	3
4.	SEC-2	AI-Driven Data Visualisation and Storytelling	1	0	2	3
5.	SEC-3	Testing of Cosmetics and Hygienic Products	2	0	1	3
6.	SEC-3	Innovation and Entrepreneurship	3	0	0	3
Ability Enhancement Courses (AEC)						
S. No.	Category	Name of the Course	L	T	P	C
1.	AEC-1	English Proficiency I	0	0	2	2
2.	AEC-2	English Proficiency II	0	0	2	2
3.	AEC-3	Today's Science, Tomorrow's World I	2	0	0	2
4.	AEC-4	Today's Science, Tomorrow's World II	2	0	0	2