Course Curriculum under

National Education Policies

COURSE STRUCTURE

BACHELOR OF SCIENCE IN CHEMISTRY

Department of Chemistry

ADAMAS UNIVERSITY

2026

Barasat, Kolkata-700 126

VISION OF THE DEPARTMENT

The Vision of the Department of Chemistry is to generate and disseminate Chemistry education among its pupils such that at individual level, a Chemistry graduate should be inspired with a sense of curiosity and wonder about the fundamental nature of the world around the student; be empowered with the ability to make decisions about their own lives and critically evaluate scientific and technological developments that impact society and lastly be equipped them with the knowledge and skills to pursue further study and rewarding careers in the chemical sciences and a wide range of related fields.

MISSION STATEMENTS OF THE DEPARTMENT

M.S 01: To represent a clear framework or narrative that gives a coherent 'big picture' of chemistry as a subject, explains why it matters, and shows how different areas of content are connected.

M.S 02: To prepare competitive and professional graduates within an innovative and intellectually stimulating environment, support other academic programs at Adamas University by offering quality chemistry learning experiences, conduct basic and applied research of national and international impact.

M.S 03: To advance knowledge platform that supports an invent-and-design culture in graduate and undergraduate chemistry education and that empowers students to address and solve challenges of global significance.

M**.S 04:** To reach out to our future thought leaders—students of all backgrounds from pre-college to doctoral candidates—to share the power of chemistry to create new knowledge directed at the major unmet needs of our time.

PROGRAMME SPECIFIC OBJECTIVES (PSO)

PSO 01: To cultivate a firm foundation in the fundamentals and application of current chemical and scientific theories including those in Analytical, Inorganic, Organic and Physical Chemistries.

PSO 02: To appreciate the importance of various elements present in the periodic table, coordination chemistry and structure of molecules, properties of compounds, structural determination of complexes using theories and instruments.

PSO 03: To be able to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments.

PSO 04: To employ critical thinking and the scientific knowledge to design, carryout, record and analyse the results of chemical reactions.

PSO 05: To create an awareness of the impact of chemistry on the environment, society, and

development outside the scientific community

Name of the Programme: Bachelor of Science in Chemistry

GRADUATE ATTRIBUTE / PROGRAMME OUTCOME (PO)

GA 01 / PO 01: **Knowledge Integration:** To apply contextual knowledge and modern tools of chemical research for solving problems

GA 02 / PO 02: Critical Thinking: To cultivate a firm foundation in the fundamentals and application of current chemical and scientific theories including those in Analytical, Inorganic, Organic and Physical Chemistries.

GA 03 / PO 03: Chemistry Knowledge: To appreciate the importance of various elements present in the periodic table, coordination chemistry and structure of molecules, properties of compounds, structural determination of complexes using theories and instruments.

GA 04 / PO 04: Expertise in Basic Chemistry: Understands the background of organic reaction mechanisms, complex chemical structures, and instrumental method of chemical analysis, molecular rearrangements and separation techniques.

GA 05 / PO 05: Analytical Skills To be able to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments.

GA 06 / PO 06: Professional Growth: Upon completion of a BS in Chemistry degree, students are able to understand theoretical concepts of instruments that are commonly used in most chemistry fields as well as interpret and use data generated in instrumental chemical analyses.

GA 07 / PO 07: Environment and Sustainability: Find out the green route for chemical reaction for sustainable development.

GA 08 / PO 08: Modern Tools Usage: Use modern chemical tools, Models, Chem-draw, Charts and Equipment's.

GA 09 / PO 09: Ethics: Understand the ethical, historic, philosophical, and environmental dimensions of problems and issues facing chemists.

SCHOOL OF BASIC AND APPLIED SCIENCES								
UNDERGRAGUATE COURSE STRUCTURE								
B.Sc. (CHEMISTRY)								
BATCH 2026-27								
SEMESTER I								
S.No	**Type of Course**	**Code**	**Title of the Course**	**Contact Hours Per Week**				**Remarks**
				L	**T**	**P**	**C**	
1	CC	CHM101	Fundamental Chemistry-I	3	0	1	4	CC-1
2	CC	CHM102	Fundamental Chemistry-II	3	0	1	4	CC-2
3	MDC		To be chosen from the given bucket				3	
4	Minor	IKS101	Introduction to IKS	4	0	0	4	
5	SEC	GEN103	AI for Science				2	
6	VAC	VAC101	Environmental Education-I	2			2	
7	AEC	AEC101	Communicative English-I	2			2	
8			Foreign Language I				2	
Semester Credits							**23**	
SEMESTER II								
9	CC	CHM105	General Chemistry-I	3	0	1	4	CC-3
10	CC	CHM106	General Chemistry-II	3	0	1	4	CC-4
11	MDC		To be chosen from the given bucket				3	
12	SEC	SEC106	Green Methods in Chemistry	1	0	1	2	
13	VAC		Community Engagement and Social Responsibility	0	0	0	2	
14	Minor	GEN104	Basic Cyber Security and Internet of Things	4	0	0	4	
15	AEC		Foreign Language II	2	0	0	2	
16		AEC102	Communicative English-II	2	0	0	2	
17	SEC		Soft skill and aptitude	1	0	0	1	
Semester Credits							**24**	
SEMESTER III								
18	CC	CHM201	General Chemistry-III	3	0	1	4	CC-5
19	CC	CHM202	General Chemistry-IV	3	0	1	4	CC-6
20	MDC		To be chosen from the given bucket	3			3	
21	VAC	VAC102	Human Values and Ethics				2	
	SEC	SEC107	Fuel Chemistry	2	0	0	2	
22	Minor		To be chosen from the given bucket	2	1	1	4	
23	SEC		Soft skill and aptitude	1	0	0	1	
24								
Semester Credits							**20**	
SEMESTER IV								
25	CC	CHM205	Organic Chemistry-I	3	0	1	4	CC-7
26	CC	CHM206	Physical Chemistry-I	3	0	1	4	CC-8
27	CC	CHM207	Inorganic Chemistry-I	3	0	1	4	CC-9
28	SEC	SEC108	Pharmaceutical Chemistry	2	0	0	2	
29	VAC		To be chosen from the given bucket				2	
30	Minor		To be chosen from the given bucket	2	1	1	4	

31	SEC		Soft skill and aptitude	1	0	0	1	
Semester Credits							**21**	
SEMESTER V								
32	CC	CHM301	Organic Chemistry-II	3	0	1	4	CC-10
33	CC	CHM302	Physical Chemistry-II	3	0	1	4	CC-11
34	CC	CHM303	Inorganic Chemistry-II	3	0	1	4	CC-12
35	SEC	SEC109	Mathematical and Computation in Chemistry	1	0	1	2	
36	Minor		To be chosen from the given bucket	3	1	0	4	
37	INT	CHM305	Internship				4	
38	SEC		Soft skill and aptitude	1	0	0	1	
Semester Credits							**23**	
SEMESTER VI								
39	CC	CHM306	Spectroscopy	3	1	0	4	CC-13
40	CC	CHM307	Organometallics and reaction kinetics	3	1	0	4	CC-14
41	CC	CHM321	Organic Spectroscopy	3	1	0	4	
42	CC	CHM308/ CHM309/CHM322	Advanced special chemistry-1 1. Solid state chemistry 2. Materials of Industrial Importance 3. Stereochemistry and Heterocyclic Chemistry-II	3 /3/ 3	0 / 0 / 1	1/1/0	4	CC-15
43	SEC	SEC110	AI in Chemistry	2	0	0	2	
44	Minor		To be chosen from the given bucket	3	1	0	4	
45	SEC		Soft skill and aptitude	1	0	0	1	
Semester Credits							**23**	
Total Credits of the Program after 3rd Year							**134**	
			SEMESTER VII					
46	CC	CHM401/CHM402/ CHM440	Advanced special chemistry -2 1. Fundamentals of nanomaterials 2. Polymer and paints 3. Chemical Systems Biology	3/ 3/ 3	0 / 0 / 1	1/1/0	4	CC-16
47	CC	CHM404	Inorganic Cluster and spectroscopic application	3	1	0	4	CC-17
48	CC	CHM405	Photochemical and pericyclic reactions	3	1	0	4	CC-18
49	CC (For With research)	CHM406	Research Methodology	2	1	1	4	CC-19 (Research)
50	CC (For Without research)	CHM407	Supramolecular Chemistry and its application	3	1	0	4	CC-19(without Research)
51	Minor		To be chosen from the given bucket	2	1	1	4	

52	SEC		Soft skill and aptitude	1	0	0	1	
Total Semester Credit							**21**	
			Semester VIII					
53	CC	CHM409/CHM410/ CHM423	Advanced special chemistry -3 1. Medical Nano-technology 2. Analytical Methods in Industry 3. Medicinal Chemistry	3/ 3/ 3	0 / 1 / 1	1/0/0	4	CC-20
54	CC (For Without Research)	CHM412	Reagent Chemistry	3	1	0	4	CC-21
55	CC (For Without Research)	CHM413	Natural Products and bio-organic chemistry	3	1	0	4	CC-22(without Research)
56	Minor		To be chosen from the given bucket	3	1	0	4	
57	Minor		To be chosen from the given bucket	3	1	0	4	
58	Dissertation	CHM416	Project/Dissertation	0	0	12	12	
Total Semester Credit							**20**	
Total Credits of the Program after 4th Year							**175**	

*NOTE: With research is only allowed for Students ***who secure 75% marks and above in the first six semesters***