

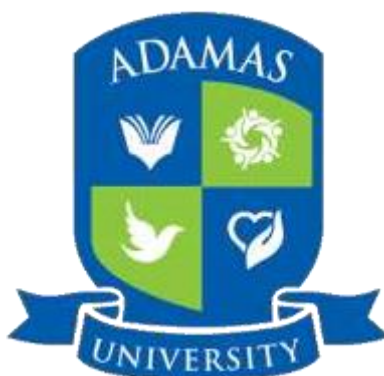
# **Course Curriculum under**

**National Education Policies**

**COURSE STRUCTURE**

**FOR**

**BACHELOR OF SCIENCE IN CHEMISTRY**



**Department of Chemistry**

**ADAMAS UNIVERSITY**

**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**

**UNDERGRADUATE COURSE STRUCTURE**

**B.SC (HONS) CHEMISTRY**

**BATCH 2024-28**

**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			3	0	0	3	
4	AEC	AEC101	Communicative English-I				3	
5	Minor			3	0	1	4	
6	VAC	VAC101	Environmental Education-I				2	
<b>Semester Credits</b>							<b>20</b>	

**SEMESTER II**

7	CC	CHM105	General Chemistry-I	3	0	1	4	CC-3
8	CC	CHM106	General Chemistry-II	3	0	1	4	CC-4
9	MDC			3			3	
10	SEC	CHM106	Green Methods in Chemistry	2	0	0	2	
11	VAC		Community Engagement and Social Responsibility	0	0	0	2	
12	AEC	AEC102	Communicative English-II	3	0	0	3	
13	Minor			3	0	1	4	
<b>Semester Credits</b>							<b>22</b>	

**SEMESTER III**

14	CC	CHM201	General Chemistry-III	3	0	1	4	CC-5
15	CC	CHM202	General Chemistry-IV	3	0	1	4	CC-6
16	MDC			3			3	
17	VAC	VAC102	Human Values and Ethics	2	0	0	4	
18	AEC	AEC106	Professional communication skills				2	
19	SEC	SEC107	Fuel Chemistry	2	0	0	2	
20	Minor			2	1	1	2	
<b>Semester Credits</b>							<b>21</b>	

**SEMESTER IV**

21	CC	CHM205	Organic Chemistry-I	3	0	1	4	CC-7
22	CC	CHM206	Physical Chemistry-I	3	0	1	4	CC-8
23	CC	CHM207	Inorganic Chemistry-I	3	0	1	4	CC-9
24	SEC	SEC108	Pharmaceutical Chemistry	2	0	0	2	
25	VAC						2	
26	Minor			2	1	1	4	
<b>Semester Credits</b>							<b>20</b>	

**SEMESTER V**

27	CC	CHM301	Organic Chemistry-II	3	0	1	4	CC-10
----	----	--------	----------------------	---	---	---	---	-------

28	CC	CHM302	Physical Chemistry-II	3	0	1	4	CC-11
29	CC	CHM303	Inorganic Chemistry-II	3	0	1	4	CC-12
30	SEC	SEC109	Computation in Chemistry	1	0	1	2	
31	Minor			3	1	0	4	
31	INT	CHM305	Internship				4	
<b>Semester Credits</b>							<b>22</b>	
<b>SEMESTER VI</b>								
32	CC	CHM306	Spectroscopy	3	1	0	4	CC-13
33	CC	CHM307	Organometallics and reaction kinetics	3	1	0	4	CC-14
34	CC	CHM308/ CHM309	Advanced special chemistry-1 1. Solid state chemistry 2. Materials of Industrial Importance	3	0	1	4	CC-15
35	SEC	SEC110	AI in Chemistry	2	0	0	2	
36	Minor			3	1	0	4	
37	Project	CHM312	Project	0	0	4	4	
<b>Semester Credits</b>							<b>22</b>	
<b>Total Credits of the Program after 3<sup>rd</sup> Year</b>							<b>127</b>	
<b>SEMESTER VII</b>								
38	CC	CHM401/-	Advanced special chemistry -2 1. Fundamentals of nanomaterials 2. Polymer and paints	3	0	1	4	CC-16
39	CC	CHM404	Inorganic Cluster and spectroscopic application	3	1	0	4	CC-17
40	CC	CHM405	Photochemical and pericyclic reactions	3	1	0	4	CC-18
41	CC (For With research)	CHM406	Research Methodology (should start working on dissertation topic)	2	1	1	4	CC-19 (Research)
42	CC (For Without research)	CHM407	Supramolecular Chemistry and its application	3	1	0	4	CC-19 (without Research)
43	Minor			2	1	1	4	
<b>Total Semester Credit</b>							<b>20</b>	
<b>Semester VIII</b>								

44	CC	CHM409/CHM410	Advanced special chemistry -3 1. Medical Nano-technology 2. Analytical Methods in Industry	3	0	1	4	CC-20
45	CC (For Witho ut Resear ch)	CHM412	Reagent Chemistry	3	1	0	4	CC-21
46	CC (For Witho ut Resear ch)	CHM413	Natural Products and bio-organic chemistry	3	1	0	4	CC- 22(without Research)
47	Minor			3	1	0	4	
48	Minor			3	1	0	4	
49	Dissert ation	CHM416	Project/Dissertation	0	0	12	12	
<b>Total Semester Credit</b>							<b>20</b>	
<b>Total Credits of the Program after 4th Year</b>							<b>167</b>	

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