

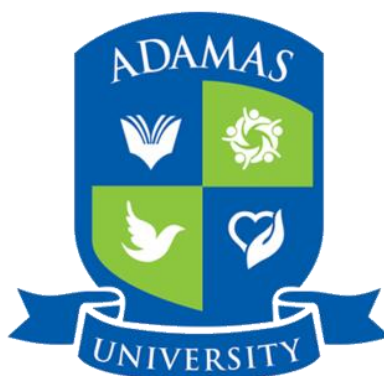
Course Curriculum under

CHOICE BASED CREDIT SYSTEM

COURSE STRUCTURE

FOR

MASTER 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.

Name of the Programme: MASTER OF SCIENCE IN CHEMISTRY PROGRAMME SPECIFIC OUTCOME (PSO)

PSO 01: Postgraduate will encompass noteworthy opportunities in various service domains both at national and international level, and can work as scientist, analyst at testing facilities/labs, quality controller in production industries, academics, research laboratories etc.

- **PSO 02:** To cultivate in –depth knowledge in Organic chemistry, Inorganic chemistry, Physical chemistry, Analytical chemistry, Spectroscopy, Pharmaceutical technique etc.
- **PSO 03:** Students will acquire deep knowledge in the study of physical, chemical, electrochemical and magnetic properties, structure elucidation using various sophisticated techniques and their applications to study various organic and inorganic materials.

PSO 04: Students will imbibe research acumen and inculcate innovative thinking so as to become a good researcher/academician as well as will perk up analytical and logical capability so as to import the ability to solve new and complex problems.

PSO 05: Postgraduate students will be able to communicate effectively the scientific information and research results in written and oral formats, to both professional scientists and to the public.

Name of the Programme: **MASTER OF SCIENCE IN CHEMISTRY**

GRADUATE ATTRIBUTE / PROGRAMME OUTCOME (PO)

GA 01 / PO 01: Chemistry Knowledge: To understand basic facts and concepts in Chemistry while retaining the exciting aspects of Chemistry so as to develop an interest in the study of chemistry as a discipline.

GA 02 / PO 02: The Chemist and society: To appreciate the achievements in Chemistry and to know the role of Chemistry in nature and in society.

GA 03 / PO 03: Computer usage in Chemistry: To design and apply appropriate experiment techniques along with IT tools to solve chemical problems. Attain familiarity with the applications of computers in chemistry: Modelling and simulation of chemical phenomena.

GA 04 / PO 04: Practical Skills: To develop skills in the proper handling of apparatus and chemicals.

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: The students after completing the postgraduate course would have equipped their ability in the field of chemical analysis by their exposure to the sophisticated analytical instruments.

GA 07 / PO 07: Effective Communication: Students will be able to communicate efficiently through project report writing, documentation and effective presentations.

GA 08 / PO 08: Skill Enhancement: The postgraduate programme in Chemistry will enhance soft skills among students which is essential for future employability through activities such as seminar, communication skills, industrial visit, internship, and dissertation

Summary of the programme (M.Sc. Chemistry)	
Course Credit	Theory +Practical
Major Compulsory Course (MCC)	
Theory (8 Papers of 3 credits each)	8×3= 24
Theory (1 paper of 4 credit)	1×4 = 4
Practical (4 Papers of 4 credits each)	4×4=16
Major Elective Course (MEC)	
Theory (4 Papers of 3 credits each)	4×3=12
Practical (2 Papers of 4 credits each)	2×4=8
Project I	1×6=6
Project II	1×8=8
Minor Elective (ME)	
Theory (2 Papers of 2 credits each)	2×2=4
Minor Compulsory (MC)	
(4 Papers of 2 credits each)	4×2 = 8
Total credit	90

Course Name: M.Sc. in Chemistry – First Semester

Subject Code	Paper Type	Subject	L	T	P	C
CHM21080	Major (Compulsory)	Physical Chemistry I	2	1	0	3
CHM21081	Major (Compulsory)	Inorganic Chemistry I	2	1	0	3
CHM21082	Major (Compulsory)	Organic Chemistry I	2	1	0	3
CHM23129	Major (Compulsory)	Mathematical and Computational Chemistry	3	0	1	4
CHM21083	Minor (Compulsory)	Analytical Chemistry	2	0	0	2
CHM22084	Major (Compulsory)	Physical Chemistry Lab	0	0	4	4
CHM22085	Major (Compulsory)	Inorganic Chemistry Lab	0	0	4	4
		TOTAL CREDIT				23

Course Name: M.Sc. in Chemistry – Second Semester

Subject Code	Paper Type	Subject	L	T	P	C
CHM21087	Major Compulsory	Physical Chemistry II	2	1	0	3
CHM21088	Major Compulsory	Inorganic Chemistry II	2	1	0	3
CHM21089	Major Compulsory	Organic Chemistry II	2	1	0	3
CHM21132	Major Compulsory	Group theory and Spectroscopy	2	1	0	3
CHM21133	Minor Compulsory	Supramolecular Chemistry and its application	2	0	0	2
CHM22095	Major Compulsory	Analytical Chemistry Lab	0	0	4	4
CHM22096	Major Compulsory	Organic Chemistry Lab	0	0	4	4
		TOTAL CREDIT				22

Course Name: M.Sc. in Chemistry – Third Semester:

Subject Code	Paper Type	Subject	L	T	P	C
CHM21134	Major Compulsory	Spectroscopy and its application	2	1	0	3
CHM21102	Major Elective-I	Advance Physical Special -I	2	1	0	3
CHM21103	Major Elective-II	Advance Physical Special-II	2	1	0	3
OR						
CHM21104	Major Elective-I	Advance Inorganic Special -I	2	1	0	3
CHM21105	Major Elective-II	Advance Inorganic Special -II	2	1	0	3
OR						
CHM21106	Major Elective-I	Advance Organic Special - I	2	1	0	3
CHM21107	Major Elective-II	Advance Organic Special - II	2	1	0	3
CHM22108	Major Elective	Advance Special Practical-1	0	0	4	4
CHM25109	Major Compulsory	Project and Dissertation-I	0	0	6	6
CHM21110	Minor Elective	Corrosion and Corrosion control system	2	0	0	2
OR						
CHM21111	Minor Elective	Organic Synthetic Strategy	2	0	0	2
OR						
CHM21112	Minor Elective	Bioinorganic Chemistry	2	0	0	2
OR						
CHM21113	Minor Elective	Any Suitable UGC-MOOCs Course ¹	2	0	0	2
CHM24114	Minor Compulsory	Internship in Industries	0	0	2	2
TOTAL CREDIT						23

Course Name: M.Sc. in Chemistry – Fourth Semester

Subject Code	Paper Type	Subject	L	T	P	C
CHM22135	Minor Compulsory	Contemporary research methodologies and data analysis	0	0	2	2
CHM21115	Minor Elective	Material Science and Nanotechnology	2	0	0	2
OR						
CHM21116	Minor Elective	Natural Product and Bioorganic Chemistry	2	0	0	2
OR						
CHM21117	Minor Elective	Any Suitable UGC-MOOCs Course ¹	2	0	0	2
OR						
CHM21121	Major Elective	Advance Physical Special -III	2	1	0	3
CHM21122	Major Elective	Advance Physical Special-IV	2	1	0	3
OR						
CHM21123	Major Elective	Advance Inorganic Special -III	2	1	0	3
CHM21124	Major Elective	Advance Inorganic Special -IV	2	1	0	3
OR						
CHM21125	Major Elective	Advance Organic Special -III	2	1	0	3
CHM21126	Major Elective	Advance Organic Special -IV	2	1	0	3
CHM22127	Major Elective	Advance Special Practical-II	0	0	4	4
CHM25128	Major Elective	Project Work and Dissertation-II	0	0	8	8
TOTAL CREDIT						22

**** Total credit of the programme M.Sc. Chemistry: 23 (1st Sem) + 22 (2nd Sem) + 23 (3rd Sem) + 22 (4th Sem) = 90

Major Elective Courses:

For third and fourth Semester: (Any one out of three choices)

1. Physical Chemistry
2. Inorganic Chemistry
3. Organic Chemistry

N.B. Offer of a particular elective paper is subjected to the availability of the expertise as well as required resources at the point of time of teaching

¹ N.B.: Students are highly encouraged to enrol their names for the suitable courses offered having minimum credit point² by **UGC-MOOCs**. A Vertical of **SWAYAM** courses as one of the skill enhancements courses. The number/grade obtained by the students following the completion of this type of courses will carry equivalent weightage/ credit for the fulfilment of their courses. The name of the courses opted by the students will be reflected in the mark sheet as reported by Head of the Department or Programme In-Charge (empowered by the Dean, SOS) to the examination section of the university.