

5 Year Int. MSc. Chemistry with Specialization in Chemical Biology / Applied Electrochemistry

Curriculum and Syllabi



DEPARTMENT OF CHEMISTRY

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Curriculum

Course Code	Course Title	L T P	Cr	ES	Course Code	Course Title	L T P	Cr	ES
SEMESTER 1					SEMESTER 2				
22MAT106	Single Variable Calculus	3 1 0	4		22MAT117	Multivariable Calculus	3 1 0	4	
22BIO101	Basic Principles of Biology	2 1 0	3		22BIO111	Cellular and Molecular Biology	2 1 0	3	
22PHY104	Mechanics	3 1 0	4		22PHY111	Basics of Electricity and Magnetism	3 1 0	4	
22CHY103	General Chemistry	3 1 0	4		22CHY112	Principles of Physical Chemistry	3 1 0	4	
22CSA103	Introduction to Scientific Computing using Python	3 0 1	4		22PHY184	Physics Lab – I Mechanics, Electricity & Magnetism	0 0 2	1	
21ENG101	Communicative English	2 0 2	3		22CHY183	Chemistry Lab - I	0 0 2	1	
22ADM101	Foundations of Indian Heritage	2 0 0	2		21ENG111	Professional Communication	1 0 2	2	
	TOTAL		24		22ADM111	Glimpses of Glorious India	2 0 0	2	
					22AVP103	Mastery Over Mind	1 0 2	2	
						TOTAL		23	
SEMESTER 3					SEMESTER 4				
22CHY204	Physical Organic Chemistry	3 1 0	4		22PHY211	Basics of Electronics	3 1 0	4	
22PHY201	Waves, Oscillations and Ray optics	3 1 0	4		22CHY213	Principles of Organic Chemistry	3 1 0	4	
22PHY202	Introduction to Mathematical Physics	3 1 0	4		22CHY215	Principles of Inorganic Chemistry	3 1 0	4	
21SSK201	Life Skills-I	1 0 2	2		22CHY214	Quantum Chemistry	2 1 0	3	
21ENV200	Environmental Science and Sustainability	3 0 0	3		21SSK211	Life Skills-II	1 0 2	2	
22CHY283	Chemistry Lab-II	0 0 2	1		22CHY284	Inorganic Chemistry Lab	0 0 5	2	
22PHY281	Physics Lab – II Optics	0 0 2	1		22CHY285	Organic Chemistry Lab	0 0 5	2	
22CSA281	Programming Lab I	0 0 2	1		21AVP211	Amrita Value Programme II	1 0 0	1	
21AVP201	Amrita Value Programme I	1 0 0	1			TOTAL		22	
	TOTAL		21						
SEMESTER 5					SEMESTER 6				
22CHY304	Chemistry of Main Group elements	3 1 0	4		22CHY315	Equilibria, Dilute solutions, Surface, and Photochemistry	3 1 0	4	
22CHY305	Organic Synthesis – I	3 1 0	4		22CHY316	Electrochemistry	3 1 0	4	
22CHY306	Molecular Symmetry and Group Theory	2 1 0	3		22CHY317	Coordination Chemistry	3 1 0	4	
22CHY307	Molecular Spectroscopy	3 1 0	4		22CHY318	Organic Synthesis – II	3 1 0	4	
22CHY391@	Open Elective/Live in Lab@	3 0 0	3			Core Elective – I	3 0 0	3	
22CHY385	Physical Chemistry Lab	0 0 5	2			Professional Elective – II	3 0 0	3	
22CHY308	Analytical Chemistry	3 1 0	4		22CHY386	Advanced Organic Chemistry Lab (Integrated MSc Only)	0 0 6	3	
	Professional elective - I	3 0 0	3		22CHY398	Project (Exit option)	0 0 6	3	
	TOTAL		27			TOTAL		25	
						TOTAL	142		
						TOTAL (for BSc. Exit-option)	145		
SEMESTER 7					SEMESTER 8				
22CHY521	Statistical and Irreversible Thermodynamic	2 1 0	3		22CHY525	Molecular Modelling and Simulation	3 0 2	4	
22CHY522	Physical Methods in Chemistry	3 0 1	4		22CHY526	Bioorganic and Natural Products Chemistry	3 1 0	4	
22CHY523	Organometallic Chemistry	3 1 0	4		22CHY527	Solid State Chemistry	2 1 0	3	
22CHY524	Frontiers in Organic Chemistry	3 1 0	4		22CHY528	Bioinorganic Chemistry	2 1 0	3	
	Core Elective - II	3 0 0	3		22CHY586	Advanced Physical Chemistry Lab	0 0 6	3	
	Core Elective - III	3 0 0	3			Core Elective –IV	22CHY499	3 0 0	3
22CHY585	Advanced Inorganic Chemistry Lab	0 0 6	3			Core Elective –V	Honors exit project*	3 0 0	3
21SSK301	Life skills III	1 0 2	2		22RM500	Research Methodology	2 0 0	2	
	TOTAL		26			TOTAL		25	
						TOTAL (for BSc Honrs. Exit-option) = 193			
SEMESTER 9					SEMESTER 10				
22CHY695	Dissertation - Phase I		10		22CHY698	Dissertation – Phase 2		10	
22CHY691	Comprehensive Viva voce		2						
	TOTAL		12			TOTAL		10	
						TOTAL CREDITS = 215			

*Honors exit project (6 credits) may be opted by a student in lieu of the two core electives (3+3 credits) if exiting with an Honors degree in the 4th year.

Electives

Code	Chemistry ELECTIVES	L T P	Cr	Code	Professional Electives	L T P	Cr
	POOL A (Chemical Biology)						
22CHY531	Chemical Biology	3 0 0	3	22CSA571	Data Structures and Algorithms	3 0 0	3
22CHY532	Medicinal Chemistry	3 0 0	3	22CSA572	Machine Learning I	3 0 0	3
22CHY533	Biosensors	2 0 2	3	22CSA574	Foundations Of Data science	2 0 2	3
22CHY534	Nanomaterials for Biological Applications	2 0 2	3	22CSA575	IoT (workshop based course)	3 0 0	3
22CHY535	Biomaterials	3 0 0	3	22CHY561	Statistical Analysis of Process Data	3 0 0	
22CHY536	Introduction to Bioinformatics	2 0 2	3	22CHY562	Safety and Hazard Management in Chemical Industries	3 0 0	3
22CHY537	Bio electrochemistry	3 0 0	3				3
22CHY538	Bio microfluidics	2 0 2	3				
	POOL B (Applied Electrochemistry)						
22CHY541	Electroanalytical Techniques	2 0 2	3				
22CHY542	Photoelectrochemistry	3 0 0	3		OPEN ELECTIVES (Chemistry)		
22CHY543	Electrochemical Energy storage systems	2 0 2	3	22OEL299	History and Philosophy of Science	3 0 0	3
22CHY544	Industrial Electrochemistry	2 0 2	3	22OEL300	EU History of Science and Technology	3 0 0	3
22CHY545	Nanomaterials for Electrochemical Applications	2 0 2	3				
22CHY546	Electroorganic Chemistry	3 0 0	3				
22CHY547	Corrosion Science	3 0 0	3				
22CHY548	Sustainable chemical sciences	3 0 0	3				