

Detailed Course Structure for the B.Sc. Chemistry (H)

ADAMAS UNIVERSITY								
SCHOOL OF BASIC AND APPLIED SCIENCES								
Department of Chemistry – B. Sc. Programme								
Semester - I								
Type of the Paper	Paper Code	Subject	Brief Contents	Contact Hour Per Week	L	T	P	Credit
Core	CHM11052	Physical-I and Organic -IA (Theory)	Kinetic theory of gases, Thermodynamics I, Chemical Kinetics I, Stereochemistry I, General Introduction and bonding features in organic molecules,	4	3	1	0	4
Core	CHM11053	Inorganic-I and Organic -IB (Theory)	Extra nuclear structure of atom, Chemical periodicity, Acids and bases, Radioactivity & General treatment of organic reaction mechanism	4	3	1	0	4
Core	CHM12054	Physical Lab-I (Practical)	List of experiments will be provided separately	3	0	0	3	2
Core	CHM12055	Inorganic Lab-I (Practical)	List of experiments will be provided separately	3	0	0	3	2
Generic Elective	MTH11101	Elective Mathematics-I	Details will be provided later	6	4	2	0	6
		Or						
Generic Elective	ZOL11001	Elective Zoology-I	Details will be provided later	4	3	1	0	4
Generic Elective	ZOL12002	Elective Zoology-I Laboratory	Details will be provided later	0	0	0	3	2
Value Added Course	DGS11011	Design Thinking	Too basic as a philosophy of user-centric iterative disciplined collaborative innovation.	2	2	0	0	2
Ability Enhancement Course (Compulsory)	ENG11057	English (Language & Literature)	Details will be provided later	2	2	0	0	2
			Total Credit					22

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Department of Chemistry – B. Sc. Programme Semester - II

Type of the Paper	Paper Code	Subject	Brief Contents	Contact Hour Per Week	L	T	P	Credit
Core	CHM11056	Organic -II and Physical IIA (Theory)	Carbon-Carbon sigma bonds, Nucleophilic Substitution Reactions, Carbon-carbon pi bonds, Electrophilic addition to C=C bond & Real gas and liquid state.	4	3	1	0	4
Core	CHM11057	Inorganic -II and Physical IIB (Theory)	Chemical bonding, Noble gases & Thermodynamics II, Colligative properties	4	3	1	0	4
Core	CHM12058	Inorganic Lab-II (Practical)	List of experiments will be provided later	3	0	0	3	2
Core	CHM12059	Organic Lab-I (Practical)	List of experiments will be provided later	3	0	0	3	2
Generic Elective	MTH11509	Elective Mathematics-II	Details will be provided later	6	4	2	0	6
		Or						
Generic Elective	ZOL11003	Elective Zoology-II	Details will be provided later	4	3	1	0	4
Generic Elective	ZOL12004	Elective Zoology-II Laboratory	Details will be provided later	3	0	0	3	2
Value Added Course	IDP14001	Inter-disciplinary Project	Basics of discipline are a prerequisite for inter-disciplinary knowledge.	3	1	0	2	3
Ability Enhancement Course (Compulsory)	EVS11105	Environmental Science and Energy Resources	Details will be provided later	2	2	0	0	2
			Total Credit					23

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Department of Chemistry – B. Sc. Programme Semester - III

Type of the Paper	Paper Code	Subject	Brief Contents	Contact Hour Per Week	L	T	P	Credit
Core	CHM11060	Physical-III (Theory)	Chemical equilibrium and Ionic equilibrium, Transport phenomena, Colloid and Surface Science	4	3	1	0	4
Core	CHM11061	Inorganic-III (Theory)	Chemistry of s and p block elements, Inorganic polymers, Redox reactions and precipitation equilibria in solution.	4	3	1	0	4
Core	CHM11062	Organic-III (Theory)	Electrophilic aromatic substitution, Synthesis of carbonyl compounds & Nucleophilic addition to C=O, Carboxylic acids and their derivatives	4	3	1	0	4
Core	CHM12063	Physical Lab- II (Practical)	List of experiments will be provided later	3	0	0	3	2
Core	CHM12064	Organic Lab-II (Practical)	List of experiments will be provided later	3	0	0	3	2
Core	CHM12065	Inorganic Lab- III (Practical)	List of experiments will be provided later	3	0	0	3	2
Generic Elective	PHY11015	Elective Physics-I	Details will be provided later	4	3	1	0	4
Generic Elective	PHY12016	Elective Physics-I Laboratory	Details will be provided later	3	0	0	3	2
		Or						
Generic Elective	CSE21641	Elective Computer Science-I	Details will be provided later	6	4	2	0	6
	CSE22642	Elective Computer Science Lab -I	Details will be provided later					
SEC	CHM11015	Intellectual Property Rights	IPR theory, Copyright, Trademarks, Patents, Geographical indications, Industrial designs, layout designs of integrated circuits, trade secrets.	2	2	0	0	2
		Or						
SEC	CHM11025	Chemistry of Cosmetics & Perfumes	Drugs and Pharmaceuticals, Fermentation	2	2	0	0	2

		Or						
SEC	CHM11017	Fuel Chemistry	Classification of fuels and their calorific value, Coal, Petroleum and petrochemical industry, Lubricants	2	2	0	0	2
		Or						
SEC	CHM11018	Any Suitable UGC-MOOCs Course ¹		2	2	0	0	2
Value Added Course	SOC14100	Community Service	Various community service as chosen by student	3	0	0	3	1
Value Added Course	EIC11001	Venture Ideation	Still students will have 2 years to ideate and proceed to next level (Implementation).	2	1	1	0	2
			Total Credit					29

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Department of Chemistry – B. Sc. Programme Semester - IV

Type of the Paper	Paper Code	Subject	Brief Contents	Contact Hour Per Week	L	T	P	Credit
Core	CHM11066	Physical IV (Theory)	Quantum Mechanics I, Phase rule, Mathematical Chemistry I based on computer programming, Basics of atomic and molecular spectroscopy	4	3	1	0	4
Core	CHM11067	Inorganic IV (Theory)	Coordination Chemistry I & II, Chemistry of d and f block elements.	4	3	1	0	4
Core	CHM11068	Organic IV (Theory)	Nitrogen compounds and Organometallics, Rearrangements, Carbocycles and heterocycles	4	3	1	0	4
Core	CHM12069	Physical Lab III (Practical)	List of experiments will be provided later	3	0	0	3	2
Core	CHM12070	Organic Lab III (Practical)	List of experiments will be provided later	3	0	0	3	2
Core	CHM12071	Inorganic Lab IV (Practical)	List of experiments will be provided later	3	0	0	3	2
Generic Elective	CSE21643	Elective Computer Science-II	Details will be provided later	4	4	2	0	4
Generic Elective	CSE22644	Elective Computer Science Lab-II	Details will be provided later	3	0	0	3	2
		Or						
Generic Elective	PHY11024	Elective Physics-II	Details will be provided later	4	3	1	0	4
Generic Elective	PHY12025	Elective Physics Lab- II	Details will be provided later	3	0	0	3	2
SEC	CHM11016	Pharmaceutical Chemistry	Preparation and uses of the following: Hair dye, hair spray, shampoo etc. antiperspirants and artificial flavors. Essential oils and their importance in cosmetic industries with reference to Eugenol, Geraniol etc.	2	2	0	0	2
		Or						
SEC	CHM11026	Green Methods in Chemistry	Principles of Green Chemistry and Designing a Chemical synthesis, Examples of Green Synthesis	2	2	0	0	2
		Or						
SEC	CHM11027	Chemoinformatics	Introduction to	2	2	0	0	2

			Chemoinformatics, Representation of molecules and chemical reactions, Searching chemical structures, Applications					
		Or						
SEC	CHM11028	Any Suitable UGC-MOOCs Course ¹		2	2	0	0	2
Value Added Course	PSG11021	Human Values and Professional Ethics	Appreciation of professional ethical dilemmas needs basic grounding in profession.	2	1	1	0	2
Allied Knowledge Enhancement Course	CHM14078	Industry Academia Interactions/Organ ization of Seminar		2	0	0	2	2
			Total Credit					30

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SCHOOL OF BASIC AND APPLIED SCIENCES
Department of Chemistry – B. Sc. Programme
Semester – V

Type of the Paper	Paper Code	Subject	Brief Contents	Contact Hour Per Week	L	T	P	Credit
Core	CHM11072	Physical -V (Theory)	Quantum Mechanics, Thermodynamic application in electrochemistry, Statistical thermodynamics	4	3	1	0	4
Core	CHM11073	Inorganic V (Theory)	Bioinorganic Chemistry, Organometallic compounds, Reaction kinetics and mechanism	4	3	1	0	4
Core	CHM11074	Organic V (Theory)	NMR, IR, UV and Mass spectra, Dynamic stereochemistry, Pericyclic reactions, Synthetic Methodology	4	3	1	0	4
Core	CHM12075	Physical Lab IV (Practical)	List of experiments will be provided later	3	0	0	3	2
Core	CHM12076	Organic Lab IV (Practical)	List of experiments will be provided later	3	0	0	3	2
Core	CHM12077	Inorganic Lab V (Practical)	List of experiments will be provided later	3	0	0	3	2
Allied Knowledge Enhancement Course	CHM14032	Minor Project		2	0	0	2	2
Discipline Specific Elective-I	CHM11033	Advanced Spectroscopy and its application (Theory)	Rotational-vibrational spectroscopy, Raman spectroscopy, Electronic spectroscopy, Magnetic resonance spectroscopy	4	3	1	0	4
Discipline Specific Elective-I Lab	CHM12034	Advanced Spectroscopy and its application Lab (Practical)	Lists of experiments will be provided later	3	0	0	3	2
		Or						
Discipline Specific Elective-I	CHM11035	Inorganic Material for Industrial Importance	Silicate industries, Glass, Fertilizers. Surface coatings, Batteries, Alloys, Chemical explosives	4	3	1	0	4
Discipline Specific Elective-I Lab	CHM12036	Inorganic Material for Industrial Importance Lab	Lists of experiments will be provided later	3	0	0	3	2

			Total Credit					26
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Department of Chemistry – B. Sc. Programme Semester - VI								
Type of the Paper	Paper Code	Subject	Brief Contents	Contact Hour Per Week	L	T	P	Credit
Core	CHM11078	Analytical Chemistry	Quantitative and qualitative aspects of analysis, optical method, thermal method, electroanalytical method, Separation techniques, Spectrophotometry	4	3	1	0	4
Allied Knowledge Enhancement Course	CHM11044	Organic VI	Synthetic Strategy, Retrosynthetic and Asymmetric analysis Carbohydrates, Amino acids and peptides, Lipids, Enzymes, Few important biochemical cycle	4	3	1	0	4
Allied Knowledge Enhancement Course	CHM15045	Dissertation	As per choice of research topics by concerned students	8	0	1	7	6
Discipline Specific Elective-II	CHM11046	Chemistry of Nanomaterials	Solid state materials, Nanomaterials, applications of nanotechnology, applications in biomedical and food industry	4	3	1	0	4
Discipline Specific Elective-II Lab	CHM12047	Chemistry of Nanomaterials Lab	List of experiments will be provided later	3	0	0	3	2
		Or						
Discipline Specific Elective-II	CHM11048	Green chemistry and chemistry of natural products	Introduction, principles of green chemistry and designing a chemical synthesis, Examples of green synthesis, future in green chemistry	4	3	1	0	4
Discipline Specific Elective-II Lab	CHM12049	Green chemistry and chemistry of natural products Lab	List of experiments will be provided later	3	0	0	3	2
Discipline Specific Elective-III	CHM11037	Environmental Chemistry	Environment and its segments, Water pollution, Energy and	4	3	1	0	4

			environment resources					
Discipline Specific Elective-III Lab	CHM12038	Environmental Chemistry Lab	Lists of experiments will be provided later	3	0	0	3	2
OR								
Discipline Specific Elective-III	CHM11041	Molecular Modelling and Drug Desiging	Introduction, Force fields, Energy Minimization and Computer Simulation, Molecular Dynamics & Monte Carlo Simulation. Structure Prediction and Drug Design	4	3	1	0	4
Discipline Specific Elective-III Lab	CHM12042	Molecular Modelling and Drug Desiging Lab	List of experiments will be provided later	3	0	0	3	2
OR								
Discipline Specific Elective-III	CHM11050	Polymer Chemistry	Functionality and its importance, kinetics of polymerization, crystallization and crystallinity, structure and nature of polymer, polymer solution, properties of polymers	4	3	1	0	4
Discipline Specific Elective-III Lab	CHM12051	Polymer Chemistry Lab	List of experiments will be provided later	3	0	0	3	2
			Total Credit					26