



ESTD: 1984

ADITYA DEGREE COLLEGE

Affiliated to Adikavi Nannaya University | Approved by APSCH | Accredited by **NAAC** with **B⁺⁺** Grade

Lakshminarayana Nagar, **Kakinada - 533 003**, Andhra Pradesh

☎ 0884 - 2376665

✉ adckkd@aditya.ac.in

https://www.aditya.ac.in/degree

CO - PO MAPPING - M.Sc., ORGANIC CHEMISTRY

SEMESTER	COURSE NAME	CO	COURSE OUTCOMES	PROGRAMME OUTCOMES																
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
I	GENERAL CHEMISTRY - I	CO1	Recap the limitations of classical mechanics at molecular length scales	2		3	2						3	2				3		
		CO2	Understand the difference between quantum and classical mechanics	2		3	2	2					2	3				2		
		CO3	Apply the principles of quantum mechanics to simple model systems relevance within chemistry		2	3	3	2				3			2					2
		CO4	Analyse for the basic principles and concepts of quantum mechanics	3		3	2	3	2			3		2	2					2
		CO5	Justify different molecular parameters for simple molecules from their electromagnetic spectra	3		2	2	3	2			3		3	3					2
		CO6	Design the general concepts of chemistry and to impart knowledge	3	3	3		2	3	2		3			2			2	2	
	INORGANIC CHEMISTRY-I	CO1	Identify the complex compounds from various inorganic molecules	3		3	2	2				3	2						2	3
		CO2	Illustrate the differences between complexes and cage compounds	2	2	2	3		2			3		2	3				2	3
		CO3	Apply the Principles of Coordination chemistry to natural chemical compounds	3	3	2	3	2	2			2	2	2						2
		CO4	Analyse chemical problems related to Inorganic chemistry	2	2	3	3	2	3	2					2					3

		CO	COURSE OUTCOMES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
		CO5	Evaluate results obtained through structure modelling and analysis of inorganic molecules	2	2	2	3		2		3		2	3			2	3	
		CO6	Synthesise compounds of structural importance	3		3	2	2			3	2					2	3	
	ORGANIC CHEMISTRY-I	CO1	Identify the aromatic compounds and non-aromatic compounds			3	2												
		CO2	Explain the basic polarisation effects	2		3	2	2						2	3			2	
		CO3	Determine the reactivity of functional groups	2	2	2	3		2		3		2	3				2	3
		CO4	Sketch the mechanisms of single step organic reactions	2	2	2	3		2		3		2	3				2	3
		CO5	Predict the stereochemistry of organic molecules	3		3	2	2			3	2						2	3
		CO6	Synthetic methods of heterocyclic compounds	2	2	2	3		2		3		2	3				2	3
	PHYSICAL CHEMISTRY - I	CO1	Recall the definitions of thermodynamics and physical properties of molecules	3	3	3		2	3	2	3			2			2		
		CO2	Explain the dependency of temperature and pressure on phase titrations	2		3	2							3	2				3
		CO3	Apply the principles and laws of equilibrium thermodynamics to multicomponent system	2		3	2	2						2	3			2	
		CO4	Characterise elementary laws of chemical kinetics	2	2	2	3		2		3		2	3				2	3
		CO5	Justify the laws of thermodynamics	2	2	2	3		2		3		2	3				2	3
		CO6	Formulate equations and functions representing kinetic behaviour of the chemical systems	3		3	2	2			3	2						2	3
II	GENERAL CHEMISTRY - II	CO1	Recall the symmetry elements	2	2	2	3		2		3		2	3			2	3	
		CO2	Recognise the structure of atom, radial and angular probability	3		3	2	2			3	2						2	3

	CO	COURSE OUTCOMES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	CO3	Determine the symmetry operations of small and medium sized molecules	2	2	2	3		2		3		2	3			2	3	
	CO4	Analyse the statistical parameters of analytical data	2	2	3	3	2	3	2				2			3	2	
	CO5	Justify between accuracy and precession	2	2	2	3		2		3		2	3			2	3	
	CO6	Develop elementary programs in Fortran for performing scientific calculations.	3		3	2	2			3	2					2	3	
	INORGANIC CHEMISTRY-II	CO1	List the properties of organometallic compounds	3		2	2	3	2		3		3	3			2	
		CO2	Demonstrate advanced concepts of Inorganic chemistry	3	3	3		2	3	2	3			2			2	
		CO3	Test the role of inorganic molecules in biological processes	3		3	2	2			3	2					2	3
		CO4	Differentiate between quantitative experiments and qualitative experiments	2	2	2	3		2		3		2	3			2	3
		CO5	Evaluate the reaction mechanisms predicted for inorganic reactions	2	2	3	3	2	3	2				2			3	2
		CO6	Synthesise inert and labile complexes	2	2	2	3		2		3		2	3			2	3
	ORGANIC CHEMISTRY-II	CO1	State various named reactions involved in carbonyl chemistry	3		3	2	2			3	2					2	3
		CO2	Explain the reaction mechanism of organic reactions	3		3	2	2			3	2					2	3
		CO3	Apply the idea about protection and deprotection of functional groups	2		3	2	2					2	3			2	
		CO4	Analyse the organic molecules using spectroscopic methods	2	2	2	3		2		3		2	3			2	3
		CO5	Conclude the functional groups by separation of organic molecules	2	2	2	3		2		3		2	3			2	2
		CO6	Prepare derivatives of organic ompounds with specific functional groups	3		3	2	2			3	2					2	3

	CO	COURSE OUTCOMES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
PHYSICAL CHEMISTRY - I	CO1	Identify the fundamental principle of magnetic resonance through theory and implement to simple examples	2	2	2	3		2		3		2	3			2	3	
	CO2	Recognise the fundamental principles of statistical thermodynamics	3		3	2	2			3	2					2	2	
	CO3	Applications of equations representing electrochemical cell	2	2	2	3		2		3		2	3			2	3	
	CO4	Analyse thermodynamic parameters using partition functions	2	2	3	3	2	3	2				2			3	2	
	CO5	Justify the thermodynamic parameters using emf data	2	2	2	3		2		3		2	3			2	3	
	CO6	Develop applications using electrochemical cells	2	2	3	3	2	3	2				2			3	2	
III	ORGANIC REACTION MECHANISM -I AND PERICYCLIC REACTIONS	CO1	Recall substitution reactions and addition reactions	3		2	2	3	2		1		3	3			2	
		CO2	Explain various types of aliphatic nucleophilic substitution reactions	3	3	3		2	3	2	3			2			2	
		CO3	Apply reaction mechanism to aromatic compounds	2		3	2						3	2				3
		CO4	Analyse various types of pericyclic reactions characterise their properties	2		3	2	2					2	3			2	
		CO5	Predict the Fmo and Pmo approaches of pericyclic reactions	2	2	2	3		2		3		2	3			2	3
		CO6	Build methods for asymmetric synthesis	2	2	2	3		2		3		2	3			2	2
ORGANIC SPECTROSCOPY-I	CO1	Define the principles involved in spectroscopic techniques	3		3	2	2			3	2					2	3	
	CO2	Discuss the principles involved in UV, IR, NMR and Mass spectroscopies	2	2	2	3		2		3		2	3			2	2	
	CO3	Apply the Woodward Hofmann rules for calculating absorption maximum in dienes and carbonyl compounds	3		3	2	2				3	2				2	3	

	CO	COURSE OUTCOMES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
				CO4	Characterise the functional groups using IR spectral data	3		2	2	3	2		3		3	3	
	CO5	Predict the chemical shift values using NMR spectra	3	3	3		2	3	2	3			2			2	
	CO6	Design the mass spectral fragmentations of various functional group molecules	2		3	2						3	2				3
ORGANIC SYNTHESIS - I	CO1	Recall the elimination reactions	2		3	2	2					2	3			2	
	CO2	Have the core idea about advanced organic chemistry and develop research oriental skills	2	2	2	3		2		3		2	3			2	3
	CO3	understand the concept and definition of named reactions, carbon carbon single and double bond reactions	2	2	2	3		2		3		2	2			2	3
	CO4	In depth knowledge about organic chemistry synthetic strategies	2	2	2	3		2		3		2	3			2	2
	CO5	Describe and apply protecting group in organic functional groups	3		3	2	2			3	2					2	3
	CO6	Achievement of advance knowledge about synthetic applications of PTC and crown ethers.	2	2	2	3		2		3		2	3			2	3
CHEMISTRY OF NATURAL PRODUCTS	CO1	Have the core ideal about different natural products-classification and isolation	3		3	2	2			3	2					2	2
	CO2	understand the concept and definition of alkaloids and general methods for structural elucidation	2	2	2	3		2		3		2	3			2	3
	CO3	In depth knowledge about natural products with a focus on isolation and structure of drugs	2	2	2	3		2		3		2	3			2	3
	CO4	Describe and apply biological activity of drugs	3		3	2	2			3	2					2	3
	CO5	Evaluate the knowledge of chemistry of natural products and drug action	2	2	2	3		2		3		2	3			2	2
	CO6	Prepare natural drugs from plants	3		3	2	2			3	2					2	3
IV	ORGANIC REACTION	CO1	Recall nucleophilic aromatic substitution reactions and benzyne mechanism	2	2	2	3		2		3		2	3		2	3

	MECHANISM - II AND ORGANIC PHOTOCHEMISTRY	CO	COURSE OUTCOMES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
		CO2	Explain NGP mechanism in aliphatic electrophilic substitution reactions	3		2	2	3	2		3		3	3					
CO3	Determination of photo process using Jablonski diagrams	3	3	3		2	3	2	3				2				2		
CO4	Analyse photochemistry of olefins, enones, dienones and aromatic compounds	2		3	2							3	2					3	
CO5	Assess the photochemistry of isomerisation reactions, carbonyl compounds	2		3	2	2						2	3				2		
CO6	Synthesise the cyclic compounds, olefins, rearranged molecules using the principles of photochemistry	2	2	2	3		2		3		2	3					2	3	
ORGANIC SPECTROSCOPY-II	CO1	Recap the Principles of ultra violet spectroscopy and IR spectroscopy	2		3	2	2					2	3				2		
	CO2	Explain the concepts of Optical Rotatory Dispersion phenomenon	2	2	2	3		2		3		2	3				2	3	
	CO3	Apply the basic principles of NMR spectroscopy in structural elucidation	2	2	2	3		2		3		2	3					2	3
	CO4	Determine the methods to characterise compounds by 2D NMR spectroscopy	3		3	2	2			3	2							2	3
	CO5	Predict the unknown organic molecules using spectral data			3	2													
	CO6	Formulate the methods of separations by TLC, GC and Column chromatography.	2		3	2	2						2	3				2	
ORGANIC SYNTHESIS - II	CO1	Recall the concept of oxidations and reductions	2	2	2	3		2		3		2	3				2	3	
	CO2	Formulate the mechanism of organic reactions using oxidations and reductions	2	2	2	3		2		3		2	3				2	3	
	CO3	Learn and identify many organic reaction mechanisms using oxidising and reducing agents	3		3	2	2			3	2							2	3
	CO4	Correlate and describe the stereochemical properties of organic molecules	2	2	2	3		2		3		2	3					2	3
	CO5	Justify the synthetic applications of organo silanes	3		2	2	3	2		3		3	3						2

	CO	COURSE OUTCOMES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
			CO6	Synthesise organic molecules using retro synthetic analysis	3	3	3		2	3	2	3				2		
BIO-ORGANIC CHEMISTRY	CO1	Recall the structure elucidation methods of natural products	2		3	2						3	2				3	
	CO2	Have the core ideal about bio organic chemistry and recent research	2		3	2	2					2	3				2	
	CO3	Understand the concept and definitions of biopolymers, vitamins and bio molecules	2	2	2	3		2		3		2	3				2	3
	CO4	In depth knowledge of antibiotics and anti malarials	2		3	2						3	2					3
	CO5	Justify biological activity of vitamins and nucleic acids	2		3	2	2					2	3				2	
	CO6	synthesise DNA, RNA and hydrolysis products	2	2	2	3		2		3		2	3				2	3