



# P.P.N.(P.G.)College,Kanpur

96@12MahatmaGandhiMarg,Kanpur-208001

•Telefax:(0512)2361924•Website:www.ppncollege.org•

•email:ppncollegekanpur@gmail.com•

## UGCHEMISTRY

### COURSE OUTCOMES(COs)

#### CERTIFICATE IN BIOORGANIC AND MEDICINAL CHEMISTRY

FIRST YEAR	SEMESTER-I	<b>Fundamentals of Chemistry</b>		<b>CODE:B020101T</b>	<b>THEORY</b>	<b>CREDIT:04</b>	
		CO1	Will Understand Molecular polarity and Weak Chemical Forces				
		CO2	Able to learn the different Bonding theories of Molecules				
		CO3	Be familiar with various Periodic properties and their trends in periods and groups.				
		CO4	Gain an understanding of the hybridization and geometry of organic molecules, their reactivity, and stability				
		CO5	Know about the different types of reactions, reagents, and reaction intermediates in organic chemistry				
		CO6	Be able to learn about the 3-dimensional structure of organic molecules and different types of Stereoisomer's, absolute configuration, and conformations.				
		CO7	Know and use different number systems and the basics of programming.				
		CO8	Be able to learn the concept of logarithm, differentiation, and integration widely used in Chemistry				
		<b>Quantitative Analysis</b>		<b>CODE:B020102P</b>	<b>PRACTICAL</b>	<b>CREDIT:02</b>	
	CO1	Water Quality analysis					
	CO2	Estimation of Metals ions					
	CO3	Estimation of acids and alkali contents					
	CO4	Estimation of inorganic salts and hydrated water					
	SEMESTER-II	<b>Bioorganic and Medicinal Chemistry</b>		<b>CODE:B020201T</b>	<b>THEORY</b>	<b>CREDIT:04</b>	
		CO1	Be able to learn the classification of carbohydrates, their structures, important reactions, and glycosidic linkages in disaccharides and polysaccharides				
		CO2	Know the biological importance, structure, and function of amino acids, Proteins, and enzymes.				
		CO3	Be familiar with the structure of nucleotides, nucleosides & nucleic Acids.				
		CO4	Know about drugs design and development, and structure-activity relationships in drugs.				
		CO5	Learn about unit cells, lattices, and crystal systems.				
CO6		Understand the basic concept of monomer, polymer, and polymerization, cross linking and its effect on polymer properties.					
CO7		Have an elementary understanding of the reaction mechanism involved in polymer synthesis.					
CO8		Learn about the electromagnetic spectrum, colour and constitution relationship and the various theories involved in it.					
<b>Biochemical Analysis</b>		<b>CODE:B020202P</b>	<b>PRACTICAL</b>	<b>CREDIT:02</b>			
CO1	Qualitative and quantitative analysis of carbohydrates						
CO2	Qualitative and quantitative analysis of Proteins, amino acids, and Fats						



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	<b>CO3</b>	Determination and identification of Nucleic Acids
	<b>CO4</b>	Synthesis of simple drug molecules.

## COURSE OUT COMES(COs)

### DIPLOMA IN CHEMICAL DYNAMICS AND ANALYTICAL TECHNIQUES

SECOND YEAR	SEMESTER-III	<b>Chemical Dynamics &amp; Coordination Chemistry</b>		<b>CODE:B020301T</b>	<b>THEORY</b>	<b>CREDIT:04</b>		
		<b>CO1</b>	Be able to derive the rate laws and order of different reactions, and know the effect of factors on rate of reaction.					
		<b>CO2</b>	Will gain knowledge of Chemical Equilibrium.					
		<b>CO3</b>	Understand components, degree of freedom, and phase rule concepts.					
		<b>CO4</b>	To understand the basic concept of Kinetic theories of Gases and different gas laws.					
		<b>CO5</b>	Know the properties of Liquid, liquid crystals, and colloidal states.					
		<b>CO6</b>	Be familiar with the various terms involved in Coordination Chemistry.					
		<b>CO7</b>	Will be able to understand various theories of Coordination Chemistry.					
		<b>CO8</b>	Will be able to understand various term states and rules involved in inorganic Spectroscopy and Magnetism.					
		<b>Physical Analysis</b>		<b>CODE:B020302P</b>	<b>PRACTICAL</b>	<b>CREDIT:02</b>		
		<b>CO1</b>	Will be able to prepare solutions of different Strengths.					
		<b>CO2</b>	Will be able to calculate the Surface tension and viscosity of pure liquids.					
		<b>CO3</b>	Can determine the Boiling point of liquids and Transition temperature of solids.					
		<b>CO4</b>	Know about the different phases and critical temperatures in Phase Equilibrium					
		SEMESTER-IV	<b>Quantum Mechanics and Analytical Techniques</b>		<b>CODE:B020401T</b>	<b>THEORY</b>	<b>CREDIT:04</b>	
			<b>CO1</b>	Will be familiar with the extra -nuclear structure of the atom, the 3-dimensional structure of orbital's, wave-particle dual nature of electrons, and can derive the Schrödinger equation.				
	<b>CO2</b>		Know about the fundamentals of Quantum Mechanics.					
	<b>CO3</b>		Will be familiar with Molecular Spectroscopy, energy-matter interaction, and its effect.					
	<b>CO4</b>		Will understand the different types of electronic transition and will be able to calculate $\lambda_{max}$ of conjugated and non-conjugated dienes according to rules.					
	<b>CO5</b>		Will understand the concept of a harmonic oscillator, molecular vibrations, and force constant, and bands for different functional groups.					
<b>CO6</b>	Will be able to identify equivalent and non-equivalent set of protons and their chemical shifts in magnetic field.							
<b>CO7</b>	Know about the molecular formula of unknown compounds via molecular weight determination.							
<b>CO8</b>	Will be familiar with different chromatographic Separation Techniques.							
<b>Instrumental Analysis</b>		<b>CODE:B020402P</b>	<b>PRACTICAL</b>	<b>CREDIT:02</b>				



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CO1	Molecular Weight Determination
CO2	2. Spectrophotometry
CO3	3. Spectroscopy
CO4	4. Chromatographic Separations

## COURSE OUTCOMES(COs) DEGREEINBACHELOROFSCIENCE

THIRD YEAR	SEMESTER-V	<b>Organic Synthesis-A</b>	<b>CODE:B020501T</b>	<b>THEORY</b>	<b>CREDIT:04</b>	
		CO1	Gain knowledge of saturated aliphatic hydrocarbons, their preparation, and general reactions. Baeyer strain theory of cyclic hydrocarbons.			
		CO2	Be familiar with the unsaturated hydrocarbons, their planar structure, various addition reactions of alkenes, and their stereoisomerism.			
		CO3	Will learn the hybridization in alkynes, the difference between alkenes and alkanes, and their important reactions in hydration and hydrohalogenation			
		CO4	Understand the structure of benzene, resonance, and different properties of aromatic compounds from aliphatic hydrocarbons.			
		CO5	Will be able to define the functional groups, nomenclature, and physical and chemical properties of alcohols			
		CO6	Will develop an understanding of unsaturated alcohol, the acidity of phenols, and the effect of various substituent on the acidity of phenols.			
		CO7	Know about the nomenclature of ethers and epoxides and their preparation and chemical reactions of ethers and epoxides			
		CO8	Know about the preparation, substitution, and elimination reactions of the alkyl halides			
			<b>Rearrangements and Chemistry of Group Elements</b>	<b>CODE:B020502T</b>	<b>THEORY</b>	<b>CREDIT:04</b>
		CO1	Will understand the conversion of different functional groups via rearrangement reactions.			
		CO2	Will know about catalysts, and their types, their effect on the reaction, and their regeneration.			
		CO3	Gain a vast knowledge of alkali and alkaline earth metals.			
		CO4	Will understand the position of Transition Elements, the study of structural trends in the periodic table, their variable oxidation states, magnetic properties, and complex formation tendencies.			
		CO5	Will learn about f-Block elements, lanthanide contractions, and the effects of lanthanide contractions on post-lanthanides			
		CO6	Know about actinide contractions, preparation, separation of actinides, and application of actinides			
		CO7	learn about the mononuclear and binuclear complexes of metal carbonyls and their reactions.			
		CO8	know about the structure of metalloporphyrin, metalloenzymes, nitrogen fixation, and the basics of bioinorganic chemistry.			
			<b>Qualitative Analysis</b>	<b>CODE:B020503P</b>	<b>PRACTICAL</b>	<b>CREDIT:02</b>
		CO1	Inorganic Qualitative Analysis			
		CO2	Elemental analysis and identification of functional groups			
		CO3	Separation of organic Mixture			
		CO4	Identification of organic compounds			



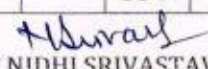
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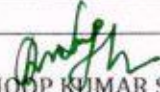
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SEMESTER-VI	<b>Organic Synthesis-B</b>		<b>CODE:B020601T</b>	<b>THEORY</b>	<b>CREDIT:04</b>
	CO1	Will learn the use of different Reagents in Organic Synthesis.			
	CO2	Will learn the nature, preparation, and uses of Organometallic Compounds of Li, Mg, Zn Cu etc.,			
	CO3	Will be familiar with the polar nature of carbonyl compounds, and important reactions of carbonyl compounds like reduction, oxidation, and nucleophilic addition reactions of aldehydes and Ketones.			
	CO4	Will gain a vast knowledge of the preparation and properties of Carboxylic acids and their Functional Derivatives.			
	CO5	Will learn keto-enol tautomerism in carbonyl compounds, the formation of enolate ion, and its role in Organic Synthesis.			
	CO6	Will learn about the primary, secondary, and tertiary amines, their basicity, diazotization of amines and other Organic Compounds of Nitrogen.			
	CO7	Will learn the chemistry of Heterocyclic compounds and their use in the development of pharmaceutical drugs			
	CO8	Will know about alkaloids & terpenoids, their chemistry, and the importance of natural compounds in medicines.			
	<b>Chemical Energetics and Radiochemistry</b>		<b>CODE:B020602T</b>	<b>THEORY</b>	<b>CREDIT:04</b>
	CO1	Explain thermodynamic systems, different terms, properties, and Zeroth law of thermodynamics.			
	CO2	Will be able to define the first and second laws of thermodynamics.			
	CO3	To gain knowledge of electrochemistry			
	CO4	Study of equilibrium established between unionized molecules and the ions in a solution of weak electrolyte.			
	CO5	Will develop a knowledge of various reactions catalyzed by light.			
	CO6	Will learn the Colligative Properties of Solutions.			
	CO7	Will develop an understanding of surface phenomena like adsorption, mechanism of adsorption, and factors affecting adsorption			
	CO8	To understand the concept of radioactivity, artificial radioactivity, radiocarbon dating, nuclear reactions, and hazards of radiation.			
	<b>Analytical Methods</b>		<b>CODE:B020603P</b>	<b>PRACTICAL</b>	<b>CREDIT:02</b>
	CO1	Gravimetric Analysis			
	CO2	Paper Chromatography			
	CO3	Thin Layer Chromatography			
	CO4	About Thermochemistry			

  
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