DPG DEGREE COLLEGE

(Affiliated to MDU Rohtak)

Sector-34, Near Marble Market, Gurugram 122001

MSC PROGRAMMS

M.Sc. Chemistry

Program outcomes listed as follows:

Students would be able to:

PSO1 Communicate concepts of Chemistry and its applications.

PSO2 Acquire analytical and logical thinking through various chemical tools and techniques.

PSO3 Investigate real life problems and learn to solve them through chemical methods.

PSO4 Attain in-depth knowledge to pursue higher studies and ability to conduct research. Work as chemical professional.

PSO5 Achieve targets of successfully clearing various examinations/interviews for placements in teaching, companies, pharma sector, industries and various other organizations/services.

S.No.	COURSE OBJECTIVES	COURSE OUTCOMES
1.	**CHEMISTRY: M.SC FIRST YEAR(ISTSEMESTER)**	
	16CHE21C1: INORGANIC CHEMISTRY-1	
	1. Get familiar with the stability of metal complexes 2. Describe the concept of intert and labile complexes 3. Evaluate the concept of displacement reaction in square planar complexes. 4. Get knowledge about binary and ternary compounds	After the completion of the course,students will be able to ● Able to learn bonding in main group compounds. ● Able to predict the shaps and hybridization ● Able to understand the structures and properties of isopoly and heteropoly acids and salts. ● Able to explain the mechanism of ligands ● Able to explain the crystal structure.
	16CHE21C2: physical chemistry-1	
	1. To introduce students to basic concept of quantum, schrondinger wave equation. 2. To develop deep understanding of the reversible and irreversible process. 3. Get familiar with the collision theory	After the completion of the course,students will be able to ● Able to learn various concept of quantum mechanics ● Learn detailed application of first and second law of thermodynamics

	4. Get knowledge about huckel-onsager treatment	● Able to explain debye huckel theory for solutions. ● Be familiar with the chain rule, partial derivatives and concept of derivation in an open subset of Rn .

	16CHE21C3: ORGANIC CHEMISTRY	
	1. To acquaint students with chemical bonding conjutation. 2. To develop deep understanding of stereochemistry. 3. Get familiar with reaction mechanism 4. Get knowledge of carbohydrates	After the completion of the course, students will be able to ● Able to learn chiral and achiral molecules. ● Able to learn simple synthesis and asymmetric synthesis of organic molecules ● Analyse the structure of carbohydrates, natural and synthetic dyes. ● Deliver the importance of reaction mechanism.
	16CHE21F1: COMPUTER FOR CHEMISTS	
	1. To introduce students to basic concept of computer 2. To develop deep understanding of the internet and internet technology 3. Get familiar with the research, sports 4. Get knowledge about analysis flowcharts	After the completion of the course, students will be able to ● Be familiar with communication computer networks. ● Understand the concept of programming language. ● Get knowledge about mass storage media ● Understand concept of algorithims program coding program testing
	16MAT21C5: Mathematical Statistics	

	5. To acquaint students with fundamentals of Statistics. 6. To develop deep understanding and working knowledge of Statistics. 7. To equip students with consequently requisite quantitative skills that they can employ and build on in flexible ways. 8. Expertise in applying Probability Distributions for the solution of real life problems. 9. Ability to perform to test hypothesis for large samples and small samples.	After the completion of the course ,students will be able to ● Understand the mathematical basis of probability and its applications in various fields of life. ● Use and apply the concepts of probability mass/density functions for the problems involving single/bivariate random variables. ● Have competence in practically applying the discrete and continuous probability distributions along with their properties. ● Decide as to which test of significance is to be applied for any given large sample problem.
2.	**CHEMISTRY: M.Sc. FIRST YEAR (IIND SEMESTER)**	
	16CHE22C1: Inorganic Chemistry-II	
	1.To explain bonding in transition metal complexes. 2.To derive spectroscopic states from spectroscopic terms and Interpret Orgel and Tanabe-Sugano diagrams. 3. To explain electronic spectra of complexes. 4. To Apply fundamentals of magnetochemistry in structure determination. 5. Explain structure and bonding in selected metal clusters and transition metal-pi complexes.	After the completion of the Course, students will be able to ● Find out the spectroscopic states from spectroscopic terms and Interpret Orgel and Tanabe-Sugano diagrams. ● Explain electronic spectra of complexes, ● Use fundamentals of magnetochemistry in structure determination ● Explain structure and bonding in selected metal clusters and transition metal-pi complexes. ● Explain bonding in transition metal complexes.

	16CHE22C2:Physical Chemistry-II	
	1.Various concepts of quantum mechanics and their applications. 2. Detailed application & third law of thermodynamics and systems of one component as well as multi-component systems. 3.Mechanism and further studies in chain reactions 4. Ion transport in solutions	After the completion of the Course, students will be able to ● Apply various concepts of quantum mechanics and their applications. ● Give detailed application & third law of thermodynamics and systems of one component as well as multi-component systems. ● Explain the mechanism and further studies in chain reactions ● Understand ion transport in solutions.
	16CHE22C3: Organic Chemistry-II	
	1. Identify and differentiate the aromatic and aliphatic nucleophilic substitution reactions. 2. Understanding all different kinds of mechanisms given by different compounds. 3. Know about the regio and chemoselectivity, and different type of elimination and addition reaction. 4. Develop capacity to solve the organic reaction mechanism related problems. 5. Develop a clear understanding about the reactions for addition to the carbon-carbon and carbon-hetero bond.	After the completion of the Course, students will be able to ● Understand the identify and differentiate the aromatic and aliphatic nucleophilic substitution reactions. ● Learn all different kinds of mechanisms given by different compounds. ● Understand about the regio and chemoselectivity, and different type of elimination and addition reaction. ● Solve the organic reaction mechanism related problems. ● Understanding about the reactions for addition to the carbon-carbon and carbon-hetero bond.
	16CHE22D2: Techniques in Chemistry	

	1. Study the spectra of compounds and propose structures for compounds. 2. Determine functional groups and write structures. 3. Study of principles and applications of UV, IR and NMR spectra.	After the completion of the Course, students will be able to ● Interpert the spectra of compounds and propose structures for compounds. ● Find out the functional groups and write structures. ● Understand the principles and applications of UV, IR and NMR spectra.
	16CHE22O1:Environmental Chemistry -I	
	1. Demonstrate knowledge of chemical and biochemical principles of fundamental environmental processes in air, water, and soil. 2. Recognize different types of toxic substances & responses and analyse toxicological information. 3. Apply basic chemical concepts to analyse chemical processes involved in different environmental problems (air, water & soil). 4. Describe causes and effects of noise pollution and discuss some mitigation strategies.	After the completion of the Course, students will be able to ● Apply knowledge of chemical and biochemical principles of fundamental environmental processes in air, water, and soil. ● Find out different types of toxic substances & responses and analyse toxicological information. ● Demonstrate basic chemical concepts to analyse chemical processes involved in different environmental problems (air, water & soil). ● Explain causes and effects of noise pollution and discuss some mitigation strategies.
3.	**CHEMISTRY:MSC FINAL YEAR (III SEMESTER)**	
	CY(H)301(a): Inorganic Special I	

	1. Get familiar with the concepts of spin resonance spectroscopy. 2. Generate new concepts of electron and mossbauer spectroscopy. 3. Describe the properties of electrochemistry of corrosion. 4. Explain concepts of corrosion inhibitors.	After the completion of the course, students will be able to learn spin resonance spectroscopy. • Understand the concepts of electron and mossbauer spectroscopy. • Describe and learn the properties of electrochemistry of corrosion.

	CY(H)302(a): Inorganic Special II	
	1. Get familiar with the concepts of nuclear chemistry, binding energy and mass defects. 2. Describe the concept of nuclear changes including fission and fusion process. 3. Establish phenomenon of radiochemical techniques. 4. Have in-depth knowledge of different types of counters.	After the completion of the course, Students will be able to ● Get familiar with the concepts of nuclear chemistry, binding energy and mass defects. ● Generate new concepts of nuclear changes including fission and fusion process. ● Describe the concept of radiochemical techniques. ● Have in-depth knowledge of different types of counters and its methods.
	CY(H)303(a): Inorganic Special III	
	1. Get familiar with the concepts of various terms in bioinorganic chemistry. 2. Describe the concept of metalloenzymes. 3. Establish phenomenon of oxygen carrier compounds. 4. Have in-depth knowledge of different classes of drugs.	After the completion of the course, Students will be able to ● Be familiar with concepts of various terms in bioinorganic chemistry. ● Describe the concept of metalloenzymes and its types and structure. ● Explain the concept of oxygen carrier compounds and its models. ● Understand the concepts of classes of drugs, ions and different types of hormones.
	CY(OE)307: Enviromental Chemistry II	

	1. Get familiar with the concepts of water quality parameters and standards. 2. Describe the concept of industrial pollution. 3. Establish phenomenon of green chemistry. 4. Have in-depth knowledge of different types of organic pollutants.	After the completion of the course, Students will be able to ● Be familiar with concepts of various terms in water quality parameters and standards. ● Describe the concept of pollution in various industries. ● Explain the concept of green chemistry and its application. ● Understand the concepts of types of organic pollutants.
4.	**CHEMISTRY:M.SC FINAL YEAR (IVTHSEMESTER)**	
	CY(H)-403(a):INORGANIC SPECIAL IV	
	1. Get familiar with the concepts of organotransition chemistry . 2. Describe the concept of various types of transition metal pi complexes. 3. Establish phenomenon of transition metal carbon multiple bonds. 4. Have in-depth knowledge of different fluxional organometallic compounds.	After the completion of the course, Students will be able to ● Be familiar with concepts of various terms in organotransition and organometallic compounds. ● Describe the concept of various types of metal pi complexes.. ● Explain the concept of transition metal carbon multiple bonds . ● Understand the concepts of different fluxional organometallic compounds.

	CY(H)-402(a):INORGANIC SPECIAL V	
	1. Get familiar with the concepts of electrodes. 2. Describe the concept of analysis different types of polargraphy terms. 3. Establish phenomenon of voltametry. 4. Have in-depth knowledge of theory of anodic and cathodic voltametry .	After the completion of the course, Students will be able to ● Be familiar with concepts of various terms in electrodes. ● Describe the concept of different types of polargraphy terms. ● Explain the concept of voltametry and its application. ● Understand the concepts of types of anodic voltametry.
	CY(H)-403(a): INORGANIC SPECIAL VI	
	1. Get familiar with the concepts of metal deficiency disease. 2. Describe the various terms of medicines. 3. Establish phenomenon of anticancer activity of metal complexes. 4. Have in-depth knowledge of different types of radiopharmacology.	After the completion of the course, Students will be able to ● Be familiar with concepts of various terms in metal deficiency disease. ● Describe the concept of various terms of bioinorganic medicinal and its values. ● Explain the concept of anticancer activity of different metal complexes. ● Understand the concepts of types of radiopharmacology. .
	17CHE23GC1: Organic Special-I	

	1. Determine functional groups and write structures. 2. Study the spectra of compounds and propose structures for compounds. 3. Elucidate the structures of organic molecules from spectral data.	After the completion of the course, Students will be able to ● Find out functional groups and write structures. ● Interpret the spectra of compounds and propose structures for compounds. ● Understand the structures of organic molecules from spectral data.
	17CHE23GC3: Organic Special-II	
	1. Able to know the determine of structure and synthesis of given vitamins. 2. Know the importance and route for the synthesis of given carotene and porphyrins. 3. Have a clear understanding about the biological importance and types of enzymes and coenzymes.	After the completion of the course, Students will be able to ● Determine of structure and synthesis of given vitamins. ● Understand the importance and route for the synthesis of given carotene and porphyrins. ● Explain biological importance and types of enzymes and coenzymes.
	17CHE23GC3: Organic Special-III	
	1. To understand the nomenclature, synthesis and reactivity of different heterocyclic compounds. 2. Elucidation of structure of Nucleosides and Nucleotides. 3. Know the general methods of formation and reaction mechanisms of Ylides. 4. Understand the relationship between physiological action and the chemical constitution of different type of drugs.	After the completion of the course, Students will be able to ● Know how to do nomenclature, synthesis and reactivity of different heterocyclic compounds. ● Explain the synthesis of Nucleosides and Nucleotides ● General methods of formation and reaction mechanisms of Ylides ● Relationship between physiological action and the chemical constitution of different type of drugs
	17CHE2301: Environmental Chemistry-II	

	1. Demonstrate knowledge of water quality parameters and standards. 2. Recognize different types of toxic substances for soil pollution and industrial pollution. 3. Describe causes and effects of environmental pollution by energy industry and discuss some mitigation strategies. 4. Explain the importance and principles of green chemistry.	After the completion of the course, Students will be able to ● Illustrate the knowledge of water quality parameters and standards. ● Understand different types of toxic substances for soil pollution and industrial pollution. ● Explain the causes and effects of environmental pollution by energy industry and discuss some mitigation strategies. ● Know the importance and principles of green chemistry.
	17CHE24GC1: Organic Special-IV	
	1. Be able to understand and deal Phenomenon of photochemistry. 2. Be able to understand the photochemical reactions of Alkenes, Carbonyl and Aromatic compounds. 3. Be able to understand and be able to apply the Woodward–Hoffmann rules governing pericyclic reactions	After the completion of the course, Students will be able to ● Understand and deal Phenomenon of photochemistry. ● Explain the photochemical reactions of Alkenes, Carbonyl and Aromatic compounds. ● Apply the Woodward–Hoffmann rules governing pericyclic reactions.
	17CHE24GC2: Organic Special-V	

	1. Identify and characterize various classes of natural products by their structures. 2. Knowledge of some of the plants around them and their pharmaceutical importance. 3. Knowledge of bacteria and other life forms from which useful pharmaceuticals are derived. 4. Acquiring the skills to isolate, purify and characterize simple products that are derived from plants and some animals.	After the completion of the course, Students will be able to ● Do identification and characterize various classes of natural products by their structures. ● Knowledge of some of the plants around them and their pharmaceutical importance. ● Knowledge of bacteria and other life forms from which useful pharmaceuticals are derived. ● Demonstrating the skills to isolate, purify and characterize simple products that are derived from plants and some animals.
	17CHE24GC3: Organic Special-VI	
	1. To apply different reagents in the organic transformations. 2. To understand the need to study molecular rearrangements. 3. To construct efficient, simple mechanistic pathways for the synthesis of a given compound	After the completion of the course, Students will be able to ● Use different reagents in the organic transformations. ● Explain the need to study molecular rearrangements. ● Construct efficient, simple mechanistic pathways for the synthesis of a given compound.


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