DATTAJIRAO KADAM ARTS,SCIENCE AND COMMEREC COLLEGE, ICHALKARANJI

DEPARTMENT OF CHEMISTRY

Details of Cross Details of Cross Cutting Issues relevant with Gender Awareness, Environmental Awareness, Professional Ethics and Human Values

Sr. No.	Name of the Course	Sem.	Title of Paper	Name of the Unit	Details of Cross Cutting Issues relevant with			
					Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
1	B.Sc -I June 2018 Onwards	I	Inorganic Chemistry	Atomic Structure and Periodicity of Elements, Chemical Bonding and Molecular Structure: Ionic Bonding, Chemical Bonding and Molecular structure (B) Valence bond theory (VBT), Chemical Bonding and Molecular structure (C) Molecular orbital theory (MOT)	———	Environmental impact of mining and processing of p-block elements, Sustainable use of elements and compounds in chemical bonding and molecular structure	Responsible handling and disposal of hazardous inorganic compounds, Accurate reporting and interpretation of experimental results in acid-base chemistry	Societal benefits of inorganic chemistry in technology and healthcare, Ethical considerations in developing new materials with potential environmental impacts
			Organic Chemistry	1. Fundamentals of Organic Chemistry, 2. Stereochemistry, 3. Aromaticity and 4. Cycloalkanes, cycloalkenes and alkadienes	———	Environmental impact of organic synthesis and waste management, 2. Sustainable approaches to aromatic compound production and use	Responsible handling and disposal of hazardous organic chemicals, Accurate reporting and interpretation of experimental results in stereochemistry	Societal benefits of organic chemistry in medicine and healthcare, Ethical considerations in developing new heterocyclic compounds with potential health impacts
		II	Physical Chemistry	Chemical Energetics, Chemical Equilibrium, Kinetic Theory of Gases, Chemical Kinetics,	———	Environmental impact of energy production and thermodynamics, Sustainable applications of electrochemistry in renewable energy	Responsible use of mathematical models in physical chemistry research, Accurate reporting and interpretation of experimental results in chemical kinetics	Societal benefits of physical chemistry in improving quality of life, Ethical considerations in developing new technologies with physical chemistry principles
			Analytical Chemistry	1. Introduction to Analytical Chemistry, 2.Chromatography 3. Theory of titrimetric Analysis 4. Water Analysis 5. Analysis of Fertilizers	———	Environmental impact of analytical chemistry methods and waste management, Sustainable practices in industrial chemistry and chromatography	Responsible use of analytical data in industrial chemistry and IPR, Accurate reporting and interpretation of titrimetric analysis results	Societal benefits of analytical chemistry in healthcare and environmental monitoring, Ethical considerations in developing new analytical methods and technologies

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					Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
1	B.Sc -I NEP 2020 June 2022 Onwards	I	Inorganic Chemistry	Atomic Structure and Periodicity of Elements, Chemical Bonding and Molecular Structure: Ionic Bonding, Chemical Bonding and Molecular structure (B) Valence bond theory (VBT), Chemical Bonding and Molecular structure (C) Molecular orbital theory (MOT)	———	Environmental impact of mining and processing of p-block elements, Sustainable use of elements and compounds in chemical bonding and molecular structure	Responsible handling and disposal of hazardous inorganic compounds, Accurate reporting and interpretation of experimental results in acid-base chemistry	Societal benefits of inorganic chemistry in technology and healthcare, Ethical considerations in developing new materials with potential environmental impacts
			Organic Chemistry	1. Fundamentals of Organic Chemistry, 2. Stereochemistry, 3. Aromaticity and 4. Cycloalkanes, cycloalkenes and alkadienes	———	Environmental impact of organic synthesis and waste management, 2. Sustainable approaches to aromatic compound production and use	Responsible handling and disposal of hazardous organic chemicals, Accurate reporting and interpretation of experimental results in stereochemistry	Societal benefits of organic chemistry in medicine and healthcare, Ethical considerations in developing new heterocyclic compounds with potential health impacts
		II	Physical Chemistry	Chemical Energetics, Chemical Equilibrium, Kinetic Theory of Gases, Chemical Kinetics,	———	Environmental impact of energy production and thermodynamics, Sustainable applications of electrochemistry in renewable energy	Responsible use of mathematical models in physical chemistry research, Accurate reporting and interpretation of experimental results in chemical kinetics	Societal benefits of physical chemistry in improving quality of life, Ethical considerations in developing new technologies with physical chemistry principles
			Analytical Chemistry	1. Introduction to Analytical Chemistry, 2.Chromatography 3. Theory of titrimetric Analysis 4. Water Analysis 5. Analysis of Fertilizers	———	Environmental impact of analytical chemistry methods and waste management, Sustainable practices in industrial chemistry and chromatography	Responsible use of analytical data in industrial chemistry and IPR, Accurate reporting and interpretation of titrimetric analysis results	Societal benefits of analytical chemistry in healthcare and environmental monitoring, Ethical considerations in developing new analytical methods and technologies

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1	B.Sc -II June 2014 Onwards	III	Organic Chemistry	Stereochemistry, Polynuclear Hydrocarbons, Study of Heterocyclic compounds, Name Reactions, Green Chemistry	———	Environmental impact of polynuclear hydrocarbons and heterocyclic compounds Applications of green chemistry principles in organic synthesis and name reactions	Proper citation and credit for contributions to organic chemistry research Responsible handling and disposal of hazardous organic compounds in labs	Appreciation for the role of organic compounds in biological systems and medicine Respect for sustainable and eco-friendly approaches to organic chemistry
		III	Analytical Chemistry	Introduction to analytical chemistry, Gravimetry, Inorganic qualitative analysis, Conducto metric Titration, Analysis of fertilizer	———	Environmental impact of analytical chemistry laboratory practices Green chemistry approaches to minimize waste in analytical methods	Proper calibration and maintenance of analytical instruments Accurate and transparent reporting of analytical results	Appreciation for the role of analytical chemistry in environmental monitoring Respect for responsible use of analytical techniques in ensuring food safety (e.g., fertilizer analysis)
		IV	Physical Chemistry	Electrochemistry, Thermodynamics, Chemical Kinetics, Physical properties of liquids	———	Environmental impact of electrochemical processes and battery disposal Applications of thermodynamics and kinetics in understanding climate change	Proper use and calibration of electrochemical instruments Accurate reporting and interpretation of thermodynamic and kinetic data	Appreciation for the role of physical chemistry in understanding natural phenomena Respect for responsible use of physical chemistry principles in developing sustainable technologies
		IV	Inorganic Chemistry	Chemistry of elements of first transition series, Study of 'f' block elements, Co-ordination chemistry, Chelation, Catalysis, Non aqueous solvents	———	Environmental impact of mining and processing transition metals Green chemistry approaches to catalysis and reducing waste in coordination chemistry	Proper handling and disposal of toxic transition metal compounds Accurate representation of chelation and catalysis mechanisms in research publications	Appreciation for the role of transition metals in biological systems and medicine Respect for responsible use of coordination chemistry in developing sustainable technologies

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1	B.Sc -II (CBCS Pattern) June 2019 Onwards	III	Physical Chemistry	1 Electrolytic Conductivity, 2 Physical Properties of Liquids, 3 Surface Chemistry, 4 Nuclear Chemistry, 5 Chemical Kinetics	———	Environmental impact of electrolytic processes and sustainable alternatives, Green chemistry applications in surface chemistry and catalysis	Responsible handling and disposal of radioactive materials in nuclear chemistry, Accurate reporting and interpretation of chemical kinetics data	Societal benefits of physical chemistry in energy and environmental applications, Ethical considerations in developing new materials and technologies with surface chemistry
		III	Industrial Chemistry	1.Basic concepts in Industrial Chemistry, 2. Unit Operations, 3.Corrosion and Electroplating, 4.Paper Industry, 5.Soap and Detergents	———	Environmental impact of industrial processes and sustainable practices, Eco-friendly alternatives in paper, soap, and detergent industries	Responsible handling and disposal of hazardous chemicals in unit operations, Ethical considerations in corrosion prevention and electroplating practices	Societal benefits of industrial chemistry in improving quality of life, Human health and safety considerations in soap, detergent, and paper production
		IV	~~Industrial Chemistry~~ Inorganic Chemistry	1.Co-ordination Chemistry, 2. Chelation, 3. P- Block elements, 4. Chemistry of elements of 3d series elements, 5 Inorganic semi-micro qualitative analysis	———	Environmental impact of mining and processing of p-block elements, Sustainable applications of coordination chemistry in green technology	Responsible handling and disposal of hazardous inorganic compounds, Accurate reporting and interpretation of analytical results in inorganic semi-micro qualitative analysis	Societal benefits of inorganic chemistry in medicine and healthcare, Ethical considerations in developing new materials with 3d series elements
		IV	Organic Chemistry	Carboxylic acids and their derivatives, Amines and Diazonium Salts, Carbohydrates, Carbonyl Compounds-Aldehydes and Ketone and Stereochemistry	———	Environmental impact of producing and disposing of organic compounds, Sustainable synthesis and green chemistry approaches in organic chemistry	Responsible handling and disposal of hazardous organic chemicals, Accurate reporting and interpretation of experimental results in organic chemistry	Societal benefits of organic chemistry in medicine and healthcare, Ethical considerations in developing new organic compounds with potential health impacts

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1	B.Sc -III June 2015 Onwards	V	Inorganic Chemistry	Hard and Soft Acids and Bases (HSAB), Metal Ligand Bonding in Transition Metal Complexes, Inorganic Polymers, Metals, Semiconductors, and Superconductors, Organometalic compounds,	———	Environmental impact of mining and processing metals for semiconductors and superconductors Green chemistry approaches to catalysis and reducing waste in organometallic synthesis	Proper citation and credit for contributions to HSAB theory and applications Accurate representation of metal-ligand bonding mechanisms in research publications	Appreciation for the role of inorganic polymers in sustainable materials development Respect for responsible use of catalysis in developing environmentally friendly
			Organic Chemistry	Introduction to Spectroscopy, UV-Vis Spectroscopy, IR Spectroscopy, NMR Spectroscopy, Mass spectroscopy, Combined Problems based on UV-Vis, IR, NMR and Mass Spectral data	———	Environmental impact of spectroscopic instrumentation and disposal, Green chemistry applications of spectroscopy in sustainable analysis	Data integrity and interpretation in spectroscopic research, Authorship and credit in collaborative spectroscopic studies	Societal benefits of spectroscopy in pharmaceuticals and healthcare, Ethical considerations in using spectroscopy for forensic analysis and security
			Physical Chemistry	Quantum Theory, Spectroscopy, Photochemistry, Solution, Electromotive force	———	Environmental impact of energy consumption in spectroscopic techniques Applications of photochemistry in understanding and mitigating climate change	Proper use and calibration of spectroscopic instruments Accurate reporting and interpretation of quantum mechanical calculations and data	Appreciation for the role of quantum theory in understanding natural phenomena Respect for responsible use of physical chemistry principles in developing sustainable energy solutions
			Industrial Chemistry	Manufactue of Heavy Chemicals, Corrosion and Passivity, Sugar Industry, Soaps and Detergents, Nanomaterials	———	Environmental impact of heavy chemical manufacturing and waste management Sustainable production and biodegradability of soaps, detergents, and nanomaterials	Proper handling and disposal of corrosive chemicals in industrial processes Accurate labeling and safety precautions for consumer products like soaps and detergents	Proper handling and disposal of corrosive chemicals in industrial processes Accurate labeling and safety precautions for consumer products like soaps and detergents

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		VI	Inorganic Chemistry	Inorganic Reaction mechanism, Thermodynamic and Kinetic aspects of metal complexes, Nuclear Chemistry, Actinides, Iron and Steel, Bio-inorganic Chemistry	———	Inorganic Reaction mechanism, Thermodynamic and Kinetic aspects of metal complexes, Nuclear Chemistry, Actinides, Iron and Steel, Bio-inorganic Chemistry	Proper handling and disposal of radioactive materials in nuclear chemistry Accurate representation of thermodynamic and kinetic data in metal complex research	Appreciation for the role of bio-inorganic chemistry in understanding biological systems Respect for responsible use of inorganic chemistry principles in developing sustainable technologies
			Organic Chemistry	Name reactions, Reagents in Organic Synthesis, Electrophilic addition to >C=C< bond and bond, Natural Products, Pharmaceuticals	———	Green chemistry approaches to name reactions and reagents in organic synthesis Sustainable sourcing and production of natural products and pharmaceuticals	Proper citation and credit for contributions to name reactions and reagents Accurate representation of electrophilic addition mechanisms in research publications	Appreciation for the role of organic chemistry in improving human health through pharmaceuticals Respect for responsible use of organic synthesis in developing sustainable and eco-friendly products
			Physical Chemistry	1. Phase equilibria,2. Thermodynamics,3. The Solid state, 4. Radioactivity, 5.Chemical kinetics, 6 Surface Chemistry	———	Environmental impact of phase equilibria in industrial processes and applications of thermodynamics in understanding climate change	Proper use and calibration of instruments in surface chemistry research and accurate reporting and interpretation of chemical kinetics data	Appreciation for the role of solid-state chemistry in developing sustainable materials and respect for responsible use of radioactivity in medical and industrial applications
			Analytical Chemistry	Theory of Titrimetric Analysis, Potentiometric Titrations, Colorimetry and Spectrophotometry, Flame Photometry, Chromatography	———	Environmental impact of chemical waste generated in titrimetric analysis and sustainable practices in chromatography	Proper calibration and maintenance of instruments in spectrophotometry and flame photometry and accurate reporting of analytical results in potentiometric titrations	Appreciation for the role of analytical chemistry in environmental monitoring and public health and respect for responsible use of analytical techniques in ensuring food safety

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1	B.Sc -III CBCS June 2020 Onwards	V	Inorganic Chemistry	Acids, Bases, and Non-aqueous Solvents, Metal Ligand Bonding in Transition Metal Complexes, Metals, Semiconductors, and Superconductors, Organometalic compounds, Catalysis	———	Green chemistry approaches Environmental toxicity of metal complexes	Responsible handling of hazardous chemicals Proper citation and credit	Addressing global challenges Respect for indigenous knowledge
			Organic Chemistry	Introduction to Spectroscopy, UV-Vis Spectroscopy, IR Spectroscopy, NMR Spectroscopy, Mass spectroscopy, Combined Problems based on UV-Vis, IR, NMR and Mass Spectral data	———	Environmental impact of spectroscopic instrumentation and disposal, Green chemistry applications of spectroscopy in sustainable analysis	Data integrity and interpretation in spectroscopic research, Authorship and credit in collaborative spectroscopic studies	Societal benefits of spectroscopy in pharmaceuticals and healthcare, Ethical considerations in using spectroscopy for forensic analysis and security
			Physical Chemistry	Elementary quantum mechanics, Spectroscopy, Photochemistry, Solution, Electromotive force	———	Environmental impact of chemical energy production and storage, Green chemistry applications of photochemistry and electrochemistry	Data integrity and interpretation in quantum mechanical calculations, Authorship and credit in collaborative research in physical chemistry	Societal benefits of photochemistry in renewable energy and sustainability, Ethical considerations in developing new energy storage technologies
			Analytical Chemistry	Theory of Gravimetric Analysis, Flame Photometry, Colorimetry and Spectrophotometry, 4.Potentiometric titrations, 5.Chromatographic techniques and Quality control	———	Environmental impact of chemical waste in analytical laboratories, Green analytical chemistry techniques for sustainable analysis	Data integrity and validation in analytical results, Responsible use of analytical techniques in quality control and assurance	Societal benefits of analytical chemistry in healthcare and safety,Ethical considerations in analytical testing for environmental monitoring

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		VI	Inorganic Chemistry	1.Coordination Chemistry, 2.Nuclear Chemistry, 3.Chemistry of f-block Elements, 4.Iron and Steel, 5.Bio –inorganic Chemistry	———	Environmental impact of mining and processing of inorganic elements, Sustainable applications of inorganic compounds in renewable energy	Responsible handling and disposal of radioactive materials in nuclear chemistry, Intellectual property and patenting in bio-inorganic chemistry research	Societal benefits of inorganic chemistry in medicine and healthcare, Ethical considerations in developing new materials for technological applications
			Organic Chemistry	1. Reagents and Reactions in Organic Synthesis, 2.Retrosynthesis, 3.Electrophilic addition to >C=C< and −C≡C− bond, 4.Natural Products, 5.Pharmaceuticals	———	Environmental impact of organic synthesis and waste management, Green chemistry approaches to sustainable organic synthesis	Responsible handling and disposal of hazardous reagents, Intellectual property and patenting in pharmaceutical research	Societal benefits of organic chemistry in medicine and healthcare, Ethical considerations in developing new pharmaceuticals and natural products
			Physical Chemistry	1. Phase equilibria,2. Thermodynamics,3. Solid state chemistry, 4. Chemical kinetics, 5. Distribution law	———	Environmental impact of industrial processes using phase equilibria and thermodynamics, Sustainable applications of solid state chemistry in energy storage	Responsible use of thermodynamic data in chemical industry, Intellectual property and patenting in chemical kinetics research	Societal benefits of physical chemistry in energy and environmental applications, Ethical considerations in developing new materials with solid state chemistry
			Industrial Chemistry	1.Sugar Industry, 2.Manufacture of industrial heavy chemicals, 3.Synthetic polymers, 4.Petroleum industry and eco-friendly fuels, 5.Nanotechnology	———	Environmental impact of industrial processes and sustainable alternatives, Eco-friendly production methods in sugar, polymer, and petroleum industries	Responsible handling and disposal of hazardous chemicals, Intellectual property and patenting in nanotechnology research	Societal benefits of industrial chemistry in improving quality of life, Ethical considerations in developing new materials and technologies

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1	M.Sc -I June 2018 onwards	I	Organic Chemistry-I	Reaction Mechanism: Structure and Reactivity, Aliphatic Nucleophilic substitutions, Introduction to aromaticity in Benzenoid and non–Benzenoid compounds, Elimination Reactions, Study of the following reactions, Stereochemistry	------	Green chemistry alternatives for hazardous reagents, Environmental impact of pharmaceutical waste from organic synthesis	Proper citation of research contributions in organic chemistry papers Responsible handling and disposal of organic chemicals	Appreciation for nature's complexity in aromatic compounds Respect for traditional knowledge of medicinal organic compounds
			Inorganic Chemistry-I	Chemistry of transition elements, Transition metal carbonyls and related compounds, Organometallic Chemistry, Metal-ligand Equilibrium in solution, Nuclear and radiochemistry	------	Toxicity of transition metal complexes in ecosystems Green synthesis methods for organometallic compounds	Proper attribution of research in transition metal publications Responsible handling of toxic metal compounds	Appreciation for beauty in molecular symmetry Respect for indigenous uses of transition metals
			Physical Chemistry-I	Thermodynamics,Statistical Thermodynamics,Colloids and surface phenomenon, Macromolecules	------	Designing biodegradable macromolecules to reduce plastic pollution and promote sustainability	Accurate reporting and transparency in thermodynamic data and research to ensure reliable decision-making.	Exploring the applications of colloids in drug delivery and medicine to improve human health and well-being.
			Analytical Chemistry-I	Basics of Analytical Chemistry, Errors, treatments and statistics, Fundamentals of Quantitative Analysis, Chromatographic methods, Electro Analytical Techniques	------	Environmental impact of spectroscopy instrument production Green analytical chemistry methods reducing waste	Proper data handling and interpretation in spectroscopy research Responsible use of analytical techniques in forensic science	Appreciation for ancient techniques inspiring modern analytical methods Respect for diverse applications of spectroscopy in various fields

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		II	Physical Chemistry-II	QUANTUM CHEMISTRY, PHOTOCHEMISTRY, ELECTROCHEMISTRY, CHEMICAL KINETICS,	------	Green electrochemistry for sustainable energy solutionsEnvironmental impact of chemical kinetics in industrial processes	Proper citation and credit in quantum chemistry publicationsResponsible handling of hazardous materials in electrochemistry labs	Appreciation for beauty in quantum mechanics principlesRespect for interdisciplinary approaches in physical chemistry research
			Analytical Chemistry-II	UV-Vis and IR Molecular Spectroscopy, Advanced Analytical Tools, Thermal Analysis, Thermal Analysis,	------	Sustainable practices in analytical chemistry laboratories Environmental applications of chromatographic techniques	Proper data handling and interpretation in analytical research Responsible use of electroanalytical techniques in industry	Appreciation for traditional Indian knowledge in chemistry Respect for diverse applications of analytical chemistry in society
			Inorganic Chemistry-I	Chemistry Of Non-transition elements and their compounds, Stereochemistry And Bonding In Main group Compounds, Non- aqueous Solvents, Chemistry Of f-block elements (Lanthanides And Actinides), Solid state chemistry	------	Developing sustainable synthetic routes for non-transition element compounds to minimize waste and pollution.	Promoting responsible use and disposal of non-aqueous solvents to prevent environmental contamination.	Appreciating the beauty and complexity of molecular structures and bonding in main group compounds.
			Organic Chemistry-II	Study of following rearrangements, Photochemistry, Hydroboration, Enamins, Oxidation, Reductions, Protection of functional group, Study of Organometallic compounds, Methodologies in organic synthesis	------	Green chemistry approaches in organic synthesis Environmental impact of organometallic compounds	Proper citation and credit in organic synthesis research Responsible handling of hazardous reagents in organic labs	Appreciation for natural products and their synthesis Respect for traditional knowledge of medicinal organic compounds

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1	M. Sc -I June 2023 onwards	I	Organic Chemistry-I	Reaction Mechanism: Structure and Reactivity, Aliphatic Nucleophilic substitutions, Introduction to aromaticity in Benzenoid and non–Benzenoid compounds, Elimination Reactions, Study of the following reactions, Stereochemistry		Green chemistry alternatives for hazardous reagents Environmental impact of pharmaceutical waste from organic synthesis	Proper citation of research contributions in organic chemistry papers Responsible handling and disposal of organic chemicals	ure's complexity in aromatic mpounds nowledge of medicinal organic mpounds
			Inorganic Chemistry-I	Chemistry of transition elements, Transition metal carbonyls and related compounds, Organometallic Chemistry, Molecular symmetry and Group Theory		Toxicity of transition metal complexes in ecosystems .Applying group theory to design more efficient and sustainable chemical processes, minimizing waste and energy consumption.	Proper attribution of research in transition metal publications Responsible handling of toxic metal compounds	Appreciation for beauty in molecular symmetry Respect for indigenous uses of transition metals
			Research Methodology	Introduction to Research Methodology,Scope of Research and Ethics,Literature search Techniques,Scientific report writing,quantitative techniques,computer applications: presentation and communication skills		Sustainability in Research: Considering the environmental impact of research methods and techniques. Eco-Friendly Data Collection: Exploring ways to minimize waste and reduce carbon footprint in data collection processes.	Data Privacy and Confidentiality: Ensuring the protection of sensitive information and maintaining confidentiality in research.	Social Responsibility in Research: Considering the potential social impact of research and promoting the well-being of research participants and communities.

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			Analytical Chemistry-I	Thermal Analysis Techniques,Atomic Spectroscopy, UV -Visible Spectroscopy,Infra red Spectroscopy		. Green Chemistry in Spectroscopy: Exploring eco-friendly alternatives and reducing hazardous waste in spectroscopic techniques..	Instrument Calibration and Validation: Ensuring accuracy, precision, and reliability in analytical results, maintaining research integrity.	Safety in Laboratory Practices: Prioritizing researcher safety and well-being when handling hazardous materials and operating spectroscopic instruments. Ariousfields
		II	Physical Chemistry-II	QUANTUMCHEMISTRY,STATISTICAL THERMODYNAMICS,ELECTROCHEMISTRY,CHEMICALKINETICS		Green electrochemistry for sustainable energy solutions Environmental impact of chemical kinetics inindustrial processes	Propercitation and creditinquantumchemistrypublicationsResponsible handling ofhazardousmaterialsinelectrochemistrylabs	Appreciation forbeautyinquantummechanicsprinciplesRespectforinterdisciplinaryapproachesin physicalchemistryresearch
			Analytical Chemistry-II	Basics of Analytical Chemistry and Indian Knowledge System (IKS), Fundamentals of Quantitative Analysis, Chromatographic Methods of Seperation, Electro Analytical Techniques		Analysis of Environmental Pollutants: Applying analytical techniques to monitor and mitigate environmental pollution.	Intellectual Property and Research Integrity: Respecting traditional knowledge and intellectual property rights in Indian Knowledge System (IKS) and analytical chemistry research.	Safety and Well-being in Laboratory: Prioritizing researcher safety and well-being when handling hazardous materials and operating analytical instruments
			Organic Chemistry-II	Organic Photochemistry,Hydroboration,Enamins, Protection of functional group,Study of Organometallic compounds,Methodologiesin organic synthesis, Reagents InOrganic Synthesis		Organic Photochemistry,Hydroboration,Enamins, Protection of functional group,Study of Organometallic compounds,Methodologiesin organic synthesis, Reagents InOrganic Synthesis	Transparency in Reporting: Ensuring accuracy, reproducibility, and transparency in reporting experimental results and characterizing compounds	Collaboration and Knowledge Sharing: Fostering teamwork, mutual respect, and open communication among researchers in organic chemistry, promoting collective progress..

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1	M. Sc II June 2022 onwards	III	Paper No.- IX Organic Reaction Mechanism	UNIT-I: Methods of determining reaction mechanism UNIT—II: Pericyclic reactions UNIT — III: A) Study of reactive intermediates B) Study of following reactions UNIT-IV: Free radical reactions	--------	Exploring ecofriendly methodology for understanding . reaction mechanisms	To improve research quality by making the accuracy and reliability in data collection and interpretation.	Adopting innovative concepts and viewpoints in understanding complex reactions.
			Paper No. –X, OCH 3.2: ADVANCED SPECTROSCOPIC METHODS	UNIT-I: A) Ultraviolet Spectroscopy B) IR Spectroscopy: UNIT-II: NMR Spectroscopy UNIT-III: Mass Spectrometry UNIT – IV: A) Carbon-13 NMR Spectroscopy B) Structural problems based on combined spectroscopic techniques	--------	Utilizing spectroscopy techniques to examine renewable organic compounds and reducing waste generated during NMR experiments.	For proper citation and credit in organic synthesis research spectroscopic tools are responsible for determining the structure of the molecules, for forensic analysis , medical dignostics	Food conamination detection, drug testing and discovery, medical dignostics

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			Paper No. – XI, OCH 3.3 : ADVANCED SYNTHETIC METHODS	UNIT–I: Disconnection approach UNIT–II: Applications of the following reagents in organic synthesis UNIT–III: A) Applications of following metal in organic synthesis B) Synthesis and applications of following ligands in organic synthesis .UNIT–IV: Application of the following in synthesis	--------	Implimenting appropriate catalytic systems to reduce waste and energy consumption. Utilizing disconnetion method to design ecofriendly synthetic approach	Take precaution when handling reagents to avoid exposure and accident, Sharing reagent-based synthesis methods to promote collaboration, Fairly assigning credit for research contributions in metal and ligand synthesis.	Enhancing novel ideas and perspectives in synthesis research, Taking responsibility for the impact of research on society.
			Paper No.- XII (A), OCH 3.4(A) : DRUG AND HETEROCYCLES	UNIT–I: A) Drug design B) Study of Antibiotics UNIT–II: Study of the Following types of drugs UNIT–III: A) Small ring Heterocycles B) Benzofused five membered Heterocycles C) Six membered Heterocycles with one heteroatom: UNIT – IV: A) Six membered Heterocycles with two and more Heteroatoms: B) Benzofused heterocycles with two hetero atom:	--------	Ensuring environmentally responsible sourcing of raw materials for drug production. Minimizing waste generated during drug manufacturing and disposal.	Ensuring accuracy and authenticity in drug design research, Respecting patents and copyrights related to heterocycle applications.Drug research methods and results to promote collaboration and developng peer review research articles to enhance research quality.	Some drugs replace missing substances or correct low levels of natural body chemicals such as some hormones or vitamins.

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DEPARTMENT OF CHEMISTRY

Details of Cross Details of Cross Cutting Issues relevant with Gender, Awareness, Environmental, Awareness, Professional Ethics and Human Values

Sr. No.	Name of the Course	Sem.	Title of Paper	Name of the Unit	Details of Cross Cutting Issues relevant with			
					Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
I	M. Sc - II June 2022 onwards	IV	Paper No.- XIII, OCH 4.1: THEORETICAL ORGANIC CHEMISTRY	UNIT–I: Molecular Orbital Theory UNIT – II: Non benzenoid aromatic Compounds UNIT – III: Green chemistry UNIT – IV A) Kinetic and thermodynamic control of reactions B) Non-classical carbocations: Formation, stability and reactivity.	----	The importance of developing sustainable and eco-friendly chemical processes in order to reduce the influence on the environment & designing environmentally friendly materials and chemicals.	when conducting research and publishing work on new substances, avoiding plagiarism and correctly crediting sources.	Promoting a culture of sustainability and responsibility towards next generations. Developing critical thinking and creativity in understanding complex molecular structures and properties.
			Paper No. – XIV, OCH 4.2: STEREOCHEMISTRY	UNIT - I : Conformational analysis and reactivity of acyclic and alicyclic compounds UNIT- II: Conformational analysis and reactivity of cyclic compounds other than six membered UNIT III: Stereoselective synthesis UNIT-IV: Stereochemistry of compounds containing no chiral carbon atoms	----	Understanding the environmental impact of acyclic and alicyclic compounds in pharmaceuticals and agrochemicals.	maintaining the accuracy and confidentiality of stereochemical data while preventing results from being manipulated.	creating a culture of creativity and invention in the creation of novel stereoselective techniques to improve human health.

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			Paper No. – XV, OCH 4.3: CHEMISTRY OF NATURAL PRODUCTS	UNIT-I: A) Introduction of natural products and Terpenoids UNIT-II: Alkaloids UNIT-III ; Steroids UNIT-IV: A) Prostaglandins: B) Lipids: C) Vitamins:	----	Helps to reduce chemical pollution, preserve biodiversity and promoting ecofriendly alternatives.	Maintaining accuracy and transparency in reporting steroid research data, avoiding misrepresentation and plagiarism.	Promoting appreciation for the cultural and traditional significance of natural products in human health and well-being.
			Paper No. - XVI (A), OCH 4.4(A): APPLIED ORGANIC CHEMISTRY	UNIT-I: A) Agrochemicals: B) Synthesis and applications of perfumery UNIT-II Unit Processes UNIT-III: Dyes and Intermediates UNIT-IV: Polymers	----	Investigating environmentally friendly dye synthesis techniques that minimize the generation of waste and water pollution.	Maintaining intellectual property rights and correctly crediting other researchers' and developers' contributions to the field of polymer science.	understanding the effects of perfumery products on human health and well-being and encouraging their sustainable and appropriate use.

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