Programme specific outcome and Course outcome of 2024-25 session (CBCS)

DEPARTMENT OF CHEMISTRY	
B.Sc. (Chemistry) General and Honours	
Programme Specific Outcome	PO1. Students will have broad and balanced knowledge in chemistry in addition to understanding of key chemical concepts, principles, and theories. PO2. Students will acquire expertise over solving both theoretical and applied chemistry problems. PO3. Students will have knowledge, ability, and skill to undertake further studies in chemistry or in related multidisciplinary areas that can be helpful for higher studies. In addition, a chemistry graduate as envisioned in this framework would be sufficiently competent in the field to undertake further discipline-specific studies, as well as to begin domain-related employment. PO4 Students will be sensitized on problems related environmental issues and will be able to correlate the importance of green chemistry. PO5 Cognitive development of students in a holistic manner, that provides the latest subject matter (both theoretical as well as practical), in such a way that foster their core competency and discovery learning PO6. Mould a responsible citizen who is aware of most basic domain-independent knowledge, including critical thinking and communication. PO7. Enable the graduates to compete in national/international and state level competitive examinations, such as IIT-JAM, CUCET, UPSC Civil Services Examination etc.

5th	**Honours**	**CHE-HC-5016** **Organic Chemistry**	Students will be able to explain/describe the important features of nucleic acids, amino acids and enzymes and develop their ability to examine their properties and applications.
	Honours	**CHE-HC-5026** **Physical Chemistry**	1. After completion of this course the students are expected to understand the application of quantum mechanics in some simple chemical systems such as hydrogen atom or hydrogen like ions. 2. Students will also learn chemical bonding in some simple molecular systems. 3. They will be able to understand the basics of various kinds of spectroscopic techniquesand photochemistry
	Generic/Regular / Honours	**CHE-RE-5016** **CHE-HE-5016** **Applications of Computers in Chemistry**	After the completion of this course, it will help the student to interpret laboratory data, curve fitting of experimental work, also perform quantum mechanical calculations for various molecular models
		CHE-RE-5026 **CHE-HE-5026** **Analytical Methods in Chemistry**	1. On successful completion students will have theoretical understanding about choice of various analytical techniques used for qualitative and quantitative characterization of samples. 2. Through the experiments, students will gain hands on experience of the discussed techniques. This will enable students to take judicious decisions while analyzing different samples.

5th	(Discipline Specific Elective (DSE))	**CHE-RE-5036** **CHE-HE-5036** **Molecular Modelling & Drug Design**	Students will be able to identify basic components of computer and programming as applied to computer assisted design and modelling of molecules.
		CHE-RE-5046 **CHE-HE-5046** **Novel Inorganic Solids**	After the completion of this course, it will also be possible for the students to opt for studying an interdisciplinary master's programme with anemphasis on the synthesis and applications of various materials or take up a job in the materials production and/or processing industry.
		CHE-RE-5056 **CHE-HE-5056** **Polymer Chemistry**	1. After completion of this course the students will learn the definition and classifications of polymers, kinetics of polymerization, molecular weight of polymers, glass transition temperature, and polymer solutions etc. 2. They also learn the brief introduction of preparation, structure and properties of some industrially important and technologically promising polymers.
		CHE-RE-5066 **CHE-HE-5066** **Instrumental Methods of Chemical Analysis**	Students shall be able to explain the theoretical basis of different analytical techniques, identify the experimental requirements and compare/analyze the data/results thereof.

5th		**CHE-SE-5014: Chemical Technology & Society**	1. Students shall be familiarized with processes and terminologies in chemical industry, like mass balance, energy balance etc. 2. Learners will be able to use chemical and scientific literacy as a mean to better

	Regular (SEC)		understand the topics related to the society.
		CHE-SE-5024: Cheminformatics	1. On the successful completion of the course, the students should be able to explain, interpret and critically examine the utility of computers and software tools to solving chemistry related problems. 2. Recognize, apply, compare, and predict chemical structures, properties, and reactivity and solve chemistry related problems. 3. Employ critical thinking and scientific reasoning to design and safely implement laboratory experiments and keep the records of the same. 4. Compile, interpret and analyze the qualitative/quantitative data and communicate the same in a scientific literature
		CHE-SE-5034: Business Skills for Chemists	Students shall be able to explain and/or analyze the important steps of business operations, finance, and intellectual property as applied to chemical industry.
		CHE-SE-5044 Intellectual Property Rights	1. After completing this course, students will have in-depth understanding about the importance and types of intellectual property rights. 2. This course will also provide the clarity on the legal and economic aspects of the IP system.
6^{th}		**CHE-HC-6016 Inorganic Chemistry**	1. Students will be expected to learn about how ligand substitution and redox reactions take place in coordination complexes.

6th	**Honours**		2. Students will also learn about organometallic compounds, comprehend their bonding, stability, reactivity and uses. 3. They will be familiar with the variety of catalysts based on transition metals and their application in industry. 4. Students in general will be able to appreciate the use of concepts like solubility product, common ion effect, pH etc. in analysis of ions and how a clever design of reactions, it is possible to identify the components in a mixture. 5. With the experiments related to coordination compound synthesis, calculation of 10Dq, controlling factors etc. will make the students appreciate the concepts of theory in experiments.
	Honours	**CHE-HC-6026** **Organic Chemistry**	1. Students will be able to explain/describe basic principles of different spectroscopic techniques and their importance in chemical/organic analysis. 2. Students shall be able to classify/identify/critically examine carbohydrates, polymers and dye materials.
		CHE-RE-6016 **CHE-HE-6016** **Green Chemistry**	1. Apart from introducing learners to the principles of green chemistry, this course will make them conversant with applications of green chemistry to organic synthesis. 2. Students will be prepared for taking up entry level jobs in the chemical industry. They also will have the option of studying further in the area.

6th	**Generic/Regular / Honours** **(DSE)**		
		CHE-RE-6026 **CHE-HE-6026** **Industrial Chemicals and Environment**	1. After successful completion of course, students would have learnt about the manufacture, applications and safe waysof storage and handling gaseous and inorganic industrial chemicals. Students will get to know about industrial metallurgy and the energy generation industry. 2. Students will also learn about environmental effects on living beings. 3. Finally, the students will learn about industrial waste management, their safe disposal and the importance of environment friendly "green chemistry" in chemical industry.
		CHE-RE-6036 **CHE-HE-6036** **Inorganic Materials of Industrial Importance**	1. This course will establish the foundation of industrial inorganic chemistry among the students. This will be helpful for pursuing further studies of industrial chemistry in future. 2. Experiments will help the students to gather the experience of qualitative and quantitative chemical analysis. 3. Students will be capable of doing analysis of the inorganic materials which are used in our daily life. They will have insight of the industrial processes.
		CHE-RE-6046 **CHE-HE-6046** **Research Methodology for Chemistry**	After completing this course, students should be able to construct a rational research proposal to generate fruitful output in terms of publications and patents in the field of chemical sciences.

6th			
		CHE-RE-6056 **CHE-HE-6056** **Dissertation**	carry out experimental or theoretical project, analyse the results and write a project report. This course will train students to conduct research in scientificmanner.
	Regular	**CHE-SE-6014** **Chemistry of Cosmetics & Perfumes**	1. Students will learn about the preparation and chemistry involved with the production different cosmetic. 2. This may encourage students to take up entry level jobs at cosmetics industry or venture into commercial production of cosmetics as an entrepreneur.
		CHE-SE-6024 **Pesticide Chemistry**	Students will be able to explain or describe and critically examine different types of pesticides, their activity/toxicity and their applications and the need for the search of an alternative based on natural products.
6th		**CHE-SE-6034** **Fuel Chemistry**	1. At the end of this course students will learn about the classes of renewable and non -renewable energy sources. 2. Students will learn about the composition of coal and crude petroleum, their classification, isolation of coal and petroleum products and their usage in various industries. 3. They will also learn to determine industrially significant physical parameters for lubricants and fuels.
