COURSE & PROGRAM OUTCOMES OF CHEMISTRY HONOURS (B.SC.) UNDER CBCS GOVT. WOMEN'S COLLEGE, BALANGIR

The CBCS Course curriculum of the discipline of Chemistry is well designed and very promising. The core course would help to enrich the subject knowledge of the students and increase their confidence level in the field of both academia and industry. Generic electives make integration among various interdisciplinary courses to fulfill the vision and mission of designing the course. The introduction of Skill Enhancement Courses (SEC) would help to gain more powerful knowledge not only in their core Chemistry subject but also in interrelated multidisciplinary subjects both theoretically and practically. The inclusion of Discipline Specific Courses (DSE) has brought an opportunity in front of students to gain knowledge on various naturally and industrially important useful materials and also helps them to familiar and expert in handling different chemistry-based software after proper training. In brief the student graduated with this type of curriculum would be able to disseminate subject knowledge along with necessary skills to suffice their capabilities for academia, entrepreneurship and industry.

After careful analysis of the course, the department of Chemistry has pointed out the following outcomes of the course.

Course Objectives and Course Outcomes

Department of Chemistry, Govt. Women's College, BALANGIR

Course Code	Course Name	Course Objective	Course Outcomes
C-I	Inorganic Chemistry-I Inorganic Chemistry-I Lab	1. To enable students with the detail knowledge of structure of atom, properties of elements and types of chemical bonds in various compounds 2. To provide the practical knowledge about different kinds of titrations	The students will learn…. 1.atomic structure 2.types of elements and their properties 3.practical experience of titration
C-II	Physical Chemistry-I Physical Chemistry-I Lab	1.To apply gas laws in various real-life situations and explain the behavior of real and ideal gas. 2.To differentiate between gaseous state and Vapour. 3.To explain the kinetic theory of gases. 4.To explain the properties of liquids. and condition required for liquefaction of gases.	The students will gain knowledge regarding…... 1.different gas laws and their practical applications. 2.Effect of pressure, temperature on the behavior of gases 3.the liquefaction parameters of different gases

C-III	Organic Chemistry-I Organic Chemistry-I Lab	1. To introduce the basic concept of organic chemistry 2. To aware about the different phenomena such as Isomerism, effects and types of organic reactions 3. To discuss the various methods of preparation and properties of simple organic molecules: alkane, alkene, alkyne and aromatic hydrocarbon	The students will acquire knowledge about……. 1.fundamental concepts in Organic Chemistry 2.Preparations, properties and applications of alkane, alkene, alkyne and aromatic hydrocarbon.
C-IV	Physical Chemistry-II Physical Chemistry-II Lab	1.To discuss the application of mathematical tools to calculate thermodynamic properties 2.To explain the relationship between microscopic properties of molecules with macroscopic thermodynamic observables the derivation of rate equations from mechanistic data. 3.To know the various properties of solution as well as colligative properties.	The students will learn…. 1.thermodynamic properties of matter 2.relation among various parameters 3.thorough knowledge regarding properties of solutions

C-V	Inorganic Chemistry-II Inorganic Chemistry-II Lab	1.To know the processes and Principles involved in extraction of different metals. 2.To get knowledge about acid and base including various theory and their applications 3.To discuss about various inorganic polymers, properties and applications	The students will gain knowledge regarding…. 1.Metallurgy by which the metals are extracted from different ores. 2.various theories of acid and base as well as importance of the acid and base in real life 3. different kinds of inorganic polymers and their applications

			in real world
C-VI	Organic Chemistry-II Organic Chemistry-II Lab	1.To study the synthesis, Properties and applications of haloalkane, haloarene, alcohol, ether and phenol. 2.To know the synthesis, chemical Properties of carbonyl compounds, carboxylic acid and their derivatives	The students will acquire knowledge about……. 1.Synthesis, Properties and Applications of haloalkane, haloarene, alcohol, ether and phenol 2.Preparations, properties and applications of carbonyl compounds, carboxylic acid and their derivatives.
C-VII	Physical Chemistry-III Physical Chemistry-III Lab	1. To acquire knowledge regarding phase equilibrium and its importance. 2. To gain the strategic knowledge regarding	The students will learn…. 1.phase equilibrium and its importance

		distribution of solute in binary mixture of two immiscible liquids	2.distribution of solute in binary mixture of two immiscible liquids.
C-VIII	Inorganic Chemistry-III Inorganic Chemistry-III Lab	1.To know about the coordinate compounds and their applications 2.To acquire knowledge regarding CFT and its significance	The students will gain knowledge regarding…... 1.coordinate compounds and their practical applications 2. CFT and its significance
C-IX	Organic Chemistry-III Organic Chemistry-III Lab	1.To increase the knowledge of students about the preparation and properties of nitrogen containing organic compounds 2.To introduce the students with natural products such as alkaloids and terpenes	The students will acquire knowledge about……. 1.preparation and properties of nitrogen containing organic compounds 2.Properties and applications of natural products such as alkaloids and terpenes.
C-X	Physical Chemistry-IV Physical Chemistry-IV Lab	1.To gain knowledge regarding conductance, motilities of ions and applications of conductance measurements 2.To enhance the knowledge of students regarding various EMF measurements and titrations.	The students will learn…. 1. conductance, motilities of ions and applications of conductance measurements 2. various EMF measurements and titrations.

C-XI	Organic Chemistry-IV Organic Chemistry-IV Lab	1.To discuss theory and application of modern spectroscopic techniques including UV-Vis, IR and NMR spectroscopy etc. 2.To enhance the knowledge about the occurrence and biological importance of carbohydrate.	The students will gain knowledge regarding…. 1. The use of UV-Vis, IR and NMR spectroscopy for organic structure elucidation 2. The fundamentals of electronic structure and bonding in conjugated and aromatic systems
C-XII	Physical Chemistry-V Physical Chemistry-V Lab	1. To know the Eigen function, Eigen value, operator and postulates of Quantum mechanics.	The students will acquire knowledge about……. 1. Eigen function, Eigen value,

		2. To learn about the characteristics of electromagnetic radiations and various photochemical reactions.	operator and postulates of Quantum mechanics. 2. Characteristics of electromagnetic radiations and various photochemical reactions.
DSE-I	DSE-I DSE-I Lab	1.To acquire knowledge regarding various polymers, their synthesis, properties and applications 2.To know about the mechanism and kinetics of polymerization.	The students will learn…. 1.what are various polymers, their synthesis, properties and applications 2.the mechanism and kinetics

			of different types of polymerizations.
DSE-II	DSE-II DSE-II Lab	1.To Introduce the students regarding the need of green chemistry and its various principles. 2.To enhance the knowledge regarding the application of green synthesis.	The students will gain knowledge regarding…. 1. A functional understanding of the field of green chemistry 2. An understanding of several real-world examples where organizations used green chemistry to improve the sustainability performance of their products
C-XIII	Inorganic Chemistry- IV Inorganic Chemistry-IV Lab	1.To know about the metal carbonyls and Ferrocene, their preparations and properties. 2.To study various industrial process and their mechanisms.	The students will acquire knowledge about……. 1.metal carbonyls and Ferrocene, their preparations and properties. 2.various industrial process and their mechanisms.
C-XIV	Organic Chemistry-V Organic Chemistry-V Lab	1.To acquire knowledge regarding biomolecules such as amino acids, peptides and proteins 2.To study the importance and application of pharmaceutical compounds.	The students will learn…. 1.various biomolecules such as amino acids, peptides and proteins 2.the importance and application of

			pharmaceutical compounds.
DSE- III	DSE-III DSE-III Lab	1. To gain knowledge regarding Industrial gases and chemicals 2. To know about Ecosystem and environmental pollutions.	The students will gain knowledge regarding…. 1.Various Industrial gases and chemicals 2. Ecosystem and Environmental pollutions.
DSE-IV	DSE-IV DSE-IV Lab Or Dissertation	1. To know the different manufacturing processes of glass, ceramics and cements 2. To know about the various	The students will acquire knowledge about……. 1. Different manufacturing processes of glass, ceramics and
		fertilizers, their manufacture and uses.	cements 2. Various types of fertilizers, their manufacture and uses.

Programme Specific Outcomes

- **PSO-1: Core competency:** The chemistry graduates are expected to gain knowledge of the fundamental concepts of chemistry and applied chemistry through theory and practical. These fundamental concepts would be reflected in the latest understanding of the field to keep continues its progression.

- **PSO-2: Communication skills:** Chemistry graduates are expected to possess minimum standards of communication skills to read and understand documents so that they can solve their problems very methodically, independently and with logical argument. Graduates are expected to build good communication skill so that they can easily share their idea/finding/concepts to others.

- **PSO-3: Critical thinking:** Chemistry graduates are expected to achieve critical thinking ability to design, carry out, record and analyze the results of chemical reactions. They can have that much potential and confidence that they can overcome many difficulties with the help of their sharp scientific knowledge and logical approaches.

- **PSO-4: Psychological skills:** Chemistry graduates are expected to possess basic psychological skills so that they can deal with individuals and students of various socio-cultural, economic and educational levels. Psychological skills are very important for proper mind setting during performing, observing and giving conclusion of a particular reaction. It is also important for self-compassion, self-reflection, interpersonal relationships, and emotional management.

- **PSO-5: Problem-solving:** Graduates are expected to be well trained with problem-solving philosophical approaches that are pertinent across the disciplines.

- **PSO-6: Analytical skill development and job opportunity:** Chemistry graduates are expected to possess sufficient knowledge how to synthesize a chemical compound and perform necessary characterization and analysis in support of the formation of the product by using modern analytical tools and advanced technologies. Because of this course curriculum chemistry graduates have lot of opportunity to get job not only in academic and administrative field but also in industry.

- **PSO-7: Research motivation:** Chemistry graduates are expected to be technically well trained with modern devices and Chemistry based software and has powerful knowledge in different disciplines of Chemistry so they can easily involve themselves in theory and laboratory-based research activities.

- **PSO-8: Teamwork:** Graduates are expected to be team players, with productive co-operations involving members from diverse socio-cultural backgrounds.

- **PSO-9: Digital Literacy:** Graduates are expected to be digitally literate for them to enroll and increase their core competency via e-learning resources such as MOOC and other digital tools for lifelong learning.

- **PSO-10: Social Awareness:** As an inhabitant of this green world, it is our duty to make our planet clean and suitable for living to all. In this context Chemistry graduates are expected to be more aware about finding green chemical reaction routes for sustainable development. They are expected to maintain good laboratory practices and safety.