**DEPARTMENT OF CHEMISTRY**
**GOVERNMENT GENERAL DEGREE COLLEGE, KALIGANJ**
PROGRAMME OUTCOME, PROGRAMME SPECIFIC OUTCOME & COURSE OUTCOME
PROGRAMME NAME: BSc Chemistry Honours

## PROGRAMME OUTCOMES (POs)

**PO1. Critical Thinking:** Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

**PO2. Effective Communication:** Ability to speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

**PO3. Social Interaction:** Elicit views of others, mediate disagreements and help reach conclusions in group settings.

**PO4. Effective Citizenship:** Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

**PO5. Ethics:** Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

**PO6. Environment and Sustainability:** Understand the issues of environmental contexts and sustainable development.

**PO7. Self-directed and Life-long Learning:** Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes. After successful completion of program course in Chemistry, students should be able to achieve the following objectives/ outcomes:

## PROGRAM SPECIFIC OUTCOMES (PSOs):

**PSO1. Acquiring Basic knowledge:** Students will able to understand basic concepts in different field of chemistry such as physical, inorganic, organic, analytical, bio-inorganic and organic, industrial chemistry *etc.*, which will help the students to analyze the physical and chemical processes occurring in the surroundings. Students can solve their subjective problems very methodically, independently and finally draw a logical conclusion.

**PSO2. Acquiring Experimental Knowledge**: After a long laboratory practice with proper safety, students will be able to demonstrate the experimental techniques and methods for chemical analysis,

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synthesis and important data collection and their interpretation. This will be helpful to the students for their higher studies and research work.

**PSO3. Analytical skill development and job opportunity:** The course curriculum is designed in such a way that Chemistry graduate students can handle many Chemistries based software, decent instruments and advanced technologies to synthesize, characterize and analyze the chemical compounds very skillfully. Such a wonderful practice in the graduate level will bring a good opportunity to the students for getting job in industries besides academic and administrative works.

**COURSE OUTCOMES (COs):**

| Semester | Course Code | Course Title | Course Outcome (CO) |
|---|---|---|---|
| Sem-1 | CHEM-MAT-1 (Inorganic-1A & Physical-1A) | Atomic Structure | **CO1.** To understand extra nuclear structure of atom, atomic orbitals and electronic configuration of atoms. |
| | | Periodic properties | **CO2.** To study in detail about the modern periodic table. Classification of elements into *s, p, d* and *f* blocks, Chemical properties of the elements along a group or period, factors influence those properties, relativistic effects and inert pair effect. |
| | | Kinetic Theory and Gaseous state | **CO3.** To understand fundamental concept of pressure, temperature, average velocity, average energy etc. of gas molecules, basic concept of kinetic theory of gases and deviation of the properties of real gas from ideal behaviour. |
| | | Chemical Thermodynamics - I | **CO4.** To understand the concept of work, heat, internal energy and enthalpy and using these concepts to establish the zeroth and first law of thermodynamics. Also to able to explain the thermochemistry of the various chemical processes. |
| | CHEM-MAP-1 (Inorganic-1A & Physical-1A) | Inorganic chemistry experiments | **CO5.** Preparation of primary standard solutions and estimation of i) carbonate and bicarbonate ii) carbonate and hydroxide present together in a mixture. |
| | | Physical chemistry experiments | **CO6.** Determination of i) heat of neutralization of a strong acid by a strong base ii) heat of solution of oxalic acid iii) pH of unknown buffer solution. |
| Sem-2 | CHEM-MAT-2 (Organic-1) | Bonding and Physical Properties | **CO1.** To learn concept of hybridization, resonance, aromaticity, covalent and non |

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| | | | covalent intermolecular forces and its application to various organic molecules, various electronic effects and factors which control the reactivity patterns in organic reactions and qualitative idea about molecular orbitals and energy level diagram. |
| | | General Treatment of Reaction Mechanism – I | **CO2.** To know the concept, types, mechanism and examples of addition, elimination, substitution, free radical and pericyclic reactions.<br><br>**CO3.** To get an idea about the generation, stability, structure and reactivity of intermediates like carbocations, carbanions, radicals, carbenes, nitrenes and benzynes. |
| | | Stereochemistry-I | **CO4.** To learn concept of stereoisomer, their various 2D projection formulae and relative and absolute configuration.<br><br>**CO5.** To learn symmetry elements and point group symmetry of organic molecules, concept of chirality, relation between symmetry and chirality, enantiomers, diastereomers, racemic compounds *etc.* |
| | CHEM-MAP-2 (Organic-1) | Separation, Purification, Boiling point determination and Identification of a pure organic compound by chemical tests | **CO6.** To learn how to purify the compounds by separating pure compound from impurities and crystallizing the pure compound from the crude. Also to learn how to determine the melting point and boiling point of solid and liquid compound respectively. Students will be able to identify a pure organic compound by performing systematic chemical tests. |

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