Department of Chemistry
Govt. Autonomous College, Rourkela

Program outcome

PO1: Students will have a form foundation in the fundamentals and application of current chemical and scientific theories including those in analytical, organic, inorganic and physical chemistry`.

PO2: Students will understand the importance of the elements in the periodic tables including their physical and chemical nature and role in daily life.

PO3: They will understand the concept of chemistry to inter relate and interact to the other subjects like mathematics, physics, biological science etc.

PO4: The chemistry syllabus in BSc and MSc level is designed in such a way to introduce the students to modern laboratory methods and principles using state of the art scientific equipment's. The students are exposed to applied laboratory techniques, critical thinking, independent and team leaving and are provided with research opportunities.

Program specific outcome of chemistry

PSO1: Have sound knowledge about the fundamentals and applications of chemical and scientific theories.

PSO2: Develop analytical skills and problem-solving skills requiring application of chemical principles.

PSO3: Every branch of science and technology is related to chemistry and so the students will have an access to different branches of science and technology.

PSO4: Will become familiar with different branches of chemistry like analytical, physical, organic, inorganic, environmental, polymer and bio-chemistry.

PSO5: Apply appropriate techniques for the qualitative and quantitative analysis of chemicals in laboratories and in industries.

PSO6: Easily assess the properties of all the elements discovered till yet.

PSO7: Acquire the ability to synthesize, separate and characterize compounds using laboratory and instrumentation techniques.

COURSE OUTCOME (B.Sc. Chemistry)

Semester I:

Core 1: ***Periodicity of elements***- Understand the periodic table and periodic properties, chemical bonding

Core 2:*States of matter*- Knowledge of different states of matter (solid, liquid and gaseous), ionic equilibria

Semester II:

Core 3:*Basic organic chemistry*-Acquiring Knowledge of Carbon –carbon sigma bond and stereochemistry

Core 4:*Chemical thermodynamics*- understanding thermodynamic properties and colligative properties

Semester III:

Core 5:*Chemistry of S and P block elements*- understanding acids and bases, noble gases and inorganic polymer

Core 6:Chemistry of halogenated hydrocarbon-Develop understanding of alcohol, phenol, carbonyl compound

Core 7:*Chemical kinetics*- In-depth understanding of chemical kinetics and catalysis

Semester IV:

Core 8:*Coordination chemistry*- understanding coordination compound and bioinorganic chemistry

Core 9:*Nitrogen containing functional group*- understanding of diazonium salt and heterocyclic compounds

Core 10:*Electrochemistry*- knowledge of electrochemistry and conductance

Semester V:

Core 11:*Nucleic acid* – understanding enzyme, amino acids, peptides and protein

Core 12:*Quantum chemistry*- Knowledge of molecular spectroscopy and photochemistry

DSE 1: ***Polymer chemistry***- understanding kinetics of polymerization, nature and structure of polymerization

DSE 2:*Green chemistry*- Study of green chemistry and future trend in green chemistry

Semester VI:

Core 13:*Principle of qualitative analysis*- understanding organometallic chemistry and reaction kinetics

Core 14:*Organic spectroscopy*- understanding organic spectroscopy, polymers and carbohydrates

DSE 3*:Industrial gases and inorganic chemicals*- understanding environment and its segments

DSE 4:*Dissertation*-To learn latest technology and application in the field of chemistry

COURSE OUTCOME (M.Sc. Chemistry)

Semester I:

MSc 101: ***Group theory***- Knowledge of molecular symmetry, stereochemistry and main group elements

MSc 102:***Aliphatic nucleophilic substitution***- understanding S_N1 mechanism, Aromatic nucleophilic substitution and Free radical reactions

MSc 103:***Quantum Chemistry***- Study of Approximation Methods and Molecular Orbital Theory

MSc 104:***Classical Thermodynamics***- understanding Phase Diagram and Statistical Thermodynamics

MSc 105: Lab- Qualitative analysis of mixtures containing not more than eight radicals and Separation and determination of two metal ions Cu-Ni, Ni-Zn, Cu-Fe etc.

Semester II:

MSc 201:***Electronic Spectra of Transition Metal Complexes***- understandingMetal-Ligand Bonding and Chemistry of transition and Inner Transition Elements

MSc 202:***Nature of Bonding in Organic Molecules***- Study of Stereochemistry and Pericyclic Reactions

MSc 203:***Surface Chemistry***- Develop knowledge of Micelles, Electrochemistry and Error Analysis

MSc 204:***Organic spectroscopy***- understanding Ultraviolet and Visible Spectroscopy, Infrared spectroscopy, Nuclear Magnetic Resonance Spectroscopy, Carbon-13 NMR spectroscopy, Mass spectrometry

MSc 205: Lab- Quantitative Analysis and Organic Synthesis

Semester III:

MSc 301***: Inorganic chemistry***- Acquire knowledge of Metal π –Complex, Metal clusters, and Reaction Mechanism of Transition Metal Complexes

MSc 302:***Organometallic Chemistry***- understandingHomogenous and Heterogeneous catalysis, Nuclear Chemistry and Magneto Chemistry & EPR

MSc 303:***Organic Chemistry***- Study of Photo-chemistry, Heterocyclic Chemistry and Organometallic reagents

MSc 304:***Spectroscopy-*** understanding Rotational Spectroscopy, Vibrational Spectroscopy, Electron Spin Resonance (ESR) spectroscopy, Raman Spectroscopy.

MSc 305: ***Seminar and review report***- To able to understand a specific topic of chemistry with paper formatting.

MSc 306: Lab- Acquiring practical knowledge of Chemical Kinetics, Adsorption, Electrochemistry, Phase equilibrium.

Semester IV:

MSc 401: ***Modern organic and materials chemistry***- To learn about organic compounds in medicine and their mode of action, modern asymmetric synthesis and material synthesis

MSc 402:***Biophysical Chemistry***- understanding biophysical and Bioorganic Chemistry

MSc 403: ***Bioinorganic and supramolecular chemis*****try**- Study of Enzymes exploiting acid catalysis, Metals in medicine and Supramolecular Chemistry

MSc 404: ***General chemistry***- understanding reaction mechanism structure and reactivity, carbon-13 NMR, Raman spectroscopy

MSc 405:**Lab-** Acquiring practical knowledge of Phase equilibrium and Electrochemistry

MSc 406: ***Dissertation***- To learn latest technology and application research in the field of chemistry