

## **Program : M.Sc.Chemistry**

### **PO(Program Outcome)**

- To demonstrate an advanced, specialized and well-rounded knowledge of the chosen academic discipline.
- To critically apply theories, methodologies, and knowledge in order to address fundamental questions in their primary area of study.
- To demonstrate skills of critical evaluation and research within the field so as to be eligible for doctoral training as academic professionals in the discipline.
- To demonstrate the ability to apply theoretical knowledge to practical and professional contexts so as to evince eligibility to occupy positions of responsibility and leadership in the society at large.
- To develop analytic thinking skills and sound oral and written communication skills so as to be able to communicate ideas effectively in a classroom or laboratory setting.
- To integrate an advanced knowledge of ICT practices so as to make the best possible use of electronic sources for academic purposes.
- To evince an interest in and knowledge of interdisciplinary frameworks of study, experiment, and research.
- To develop creativity, sound judgment skills, autonomy, ethical maturity and academic integrity with regards to their chosen disciplines.
- To develop an individual, subjective and original perspective on their chosen discipline.
- To interact harmoniously and productively with people from diverse cultures and backgrounds as peers, mentors and leaders with integrity and professionalism.

## **Program : M.Sc.Chemistry**

### **PSO(Program Specific Outcome)**

- After completion of this programme the candidate will be
- Global level research opportunities to pursue Ph.Dprogramme targeted approach of CSIR – NET examination
- Enormous job opportunities at all level of chemical, pharmaceutical, food products,life oriented material industries
- Specific placements in R & D and synthetic division of polymer industries & Allied Division
- Discipline specific competitive exams conducted by service commission

## **Program : M.Sc.Chemistry**

### **CO(Course Outcome)**

#### **SEMESTER – I**

##### **Paper – 1 CHN 401 : Inorganic Chemistry**

After the completion of the course, the student learns

- The fundamentals of stoichiometry, bonding and hybridization of molecules.
- About molecular orbital theory and crystal field theory, necessary for understanding the molecular stability, bonding, shape and structure.
- About the formation mechanism of transition metal complexes, and stability of metal-ligand complexes.

##### **Paper – II CHN 402 : Organic Chemistry**

After the completion of the course, the student learns

- The fundamentals of aromaticity, delocalization, Huckel's rule, resonance and crown ether complexes.
- About chirality, optical activity, elements of symmetry, conformational analysis of cycloalkanes and stoichiometry of N, S and P containing compounds.
- About classical and nonclassical carbocations, and the application of NMR.
- On the subject of aliphatic nucleophilic substitution reaction mechanism, and phase transfer catalyst.

##### **Paper – III CHN 403 : Physical Chemistry**

After the completion of the course, the student learns

- The fundamentals of quantum mechanics and approximate methods.
- About eigen values, electronic structure of atoms and molecular orbital theory.
- The concept of classical and statistical thermodynamics.

##### **Paper – IV CHN 404A : Group theory, Spectroscopy and Diffraction methods**

After the completion of the course, the student learns

- On the subject of symmetry and group theory.
- About fundamental principles of electromagnetism, polarization and others.
- The fundamentals of XRD and Mossbauer spectroscopy.

##### **Paper – VII CHN 501 : Inorganic Chemistry**

After the completion of the course, the student learns

- About the electronic structure and magnetic properties of transition metal complexes.
- On the subject of metal clusters and carbonyls.

- The fundamentals of metal ion containing oxyacids and salts.

### **Paper – VIII CHN 502 : Organic Chemistry**

After the completion of the course, the student learns

- About chemical dynamics underlining the rate laws and principle theories.
- types of free radical reactions, pericyclic reactions and mechanism of metal hydride reactions. On the subject of metal clusters and carbonyls.

The fundamentals of sigmatropic rearrangement and elimination reactions.

### **Paper – IX CHN 503 : Physical Chemistry**

After the completion of the course, the student learns

- About types of free radical reactions, pericyclic reactions and mechanism of metal hydride reactions. On the subject of metal clusters and carbonyls.
- The fundamentals of surfactants, adsorption isotherms, micellization, and polymers.
- The aspects of electrochemistry.

### **Paper – X CHN 504 : A Spectroscopy**

After the completion of the course, the student learns

- The fundamentals of vibrational, Raman and microwave spectroscopy.
- The basics of magnetic resonance spectroscopy.

### **Paper – I CHN 601: Organic Chemistry**

After the completion of the course, the student learns

- About the chemistry of natural coloring materials, terpenoids, vitamins and alkaloids

### **Paper – II CHN 602: Organic Chemistry**

After the completion of the course, the student learns

- The unit process and operation fundamentals of nitration, halogenations, amination, sulphonation and hydroxylation.
- About the chemistry of soaps, detergents, vegetable oils, agrochemicals, pharmaceuticals, and pulp processing.

### **Paper – III CHN 603: Organic Chemistry**

After the completion of the course, the student learns

- About medicinal chemistry.
- The basics of antibiotics, sulphadruugs, and drugs associated to nervous system.

### **Paper – I CHN 701: Organic Chemistry**

After the completion of the course, the student learns

- About the chemistry of carbohydrates, steroids, purine and nucleic acids.
- The underlying advancement in NMR and conformation of cyclic systems.

### **Paper – II CHN 702: Organic Chemistry**

After the completion of the course, the student learns

- About the chemistry of coal and petroleum products, and synthetic textiles.
- The underlying the classification and chemistry of paints, explosives, toxins, polymers, and propellents.
- The basics of household items such as shoe polish, ink, gum, disinfectants, agarbatties, etc.

### **Paper – III CHN 703: Organic Chemistry**

After the completion of the course, the student learns

- About different classes of drugs: anti-cancer, central nervous system (physicopharmacological), cardiovascular, renal, hypoglycemic drugs.