

POST GRADUATE DEPARTMENT OF CHEMISTRY, UNIVERSITY OF JAMMU, JAMMU

COURSE OUTCOMES (COS) OF THE PROGRAMMES OFFERED BY THE UNIVERSITY

M. SC. CHEMISTRY (2 YEARS)

COURSE SPECIFIC OUTCOMES (CSO)

S. No.	Course No.	Course Title	Course Outcome
1.	P2CHTC101	Inorganic Chemistry-I	This course will enable the students to learn the concept of group theory and its applications, stereochemistry and bonding, theories of bonding, metal-ligand equilibria as well as electronic spectra of transition metal complexes. After completing this course, students will be employable in R & D divisions of Industries Research and Academic Institutes.
2.	P2CHTC102	Quantum Chemistry	This course will help to understand the various aspects of quantum mechanics. In addition, the students will gather knowledge about angular momentum, approximation methods, chemical bonding, HMO methods and its applications. This course also offers employability in the research institutes and academics.
3.	P2CHTC103	Organic Chemistry-I	This course is focussed on nature of bonding in organic molecules, stereochemistry, reaction mechanism, aliphatic nucleophilic substitution and free radical reactions. After completing this course, students will be employable in R & D divisions of Industries Research and Academic Institutes.
4.	P2CHTC104	Principles of Spectroscopy	By studying this course, the students are able to concentrate on physical aspects of various techniques of spectroscopy, namely, microwave, vibrational, Raman, NMR. Information about X-ray and neutron diffraction techniques will also be dealt. After completing this course, students will be employable in R & D divisions of Industries Research and Academic Institutes.
5.	P2CHPC105	Practical Course in Inorganic, Organic & Physical Chemistry-I	This course will help the students to learn how the rare analysis of metals is analyzed and simultaneously to prepare and characterize coordination complexes. After completing this course, students will be employable in R&D divisions of Industries Research and Academic Institutes. The organic synthesis of various compounds with characteristic functional groups will be carried out. IR spectra will be used to identify various functional groups. Error analysis and statistical analysis data will be analyzed by the students before proceeding to the actual performance of various experiments as mentioned in the following details.
6.	P2CHTC201	Inorganic Chemistry-II	By studying this course, the students will come to know the mechanism of reactions in inorganic complexes, magnetic properties of complexes and metal clusters framework of complexes. After completing this course, students will be employable in R&D divisions of Industries Research and Academic Institutes.
7.	P2CHTC202	Chemical Dynamics, Surface and Electro Chemistry	This course will help to understand chemical kinetics using various theories of bimolecular and unimolecular reactions. Polymer Chemistry, Micelles and Advanced Electrochemistry details will be imparted to the students. A brief idea of nano materials is also introduced. This course also offers employability in the Research and Development sector, research institutes and academics.
8.	P2CHTC203	Organic Chemistry-II	The contents of this course are focussed on electrophilic, nucleophilic substitution, addition, elimination reactions from their

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			mechanistic point of view. Rearrangement and pericyclic reactions will also be dealt in this course. After completing this course, students will be employable in R & D divisions of Industries Research and Academic Institutes.
9.	P2CHTC204	Applications of Spectroscopy in Organic Chemistry	The course is designed from application point of view. The different spectroscopic techniques used in organic chemistry will be considered and number of examples will be put before the students to solve making use of different spectroscopic techniques. After completing this course, students will be employable in R & D divisions of Industries Research and Academic Institutes.
10.	P2CHPC205	Practical Course in Inorganic, Organic & Physical Chemistry-II	This course will help the students to learn how the rare analysis of metals is analyzed and simultaneously to prepare and characterize coordination complexes. After completing this course, students will be employable in R & D divisions of Industries Research and Academic Institutes.
11.	P2CHVC251	Vocational Course	This course is designed to equip students with practical skills in analytical methodologies, preparing them for a range of career opportunities. The course emphasizes hands-on expertise and real-world application, fostering both entrepreneurship and employability in the rapidly advancing field of analytical science.
12.	P2CHTC301	Environmental Chemistry	This course will enable the students to learn about the chemistry atmosphere, biosphere, hydrosphere, lithosphere and will to gain knowledge on air, water, soil, marine and solid waste management as well as environmental toxicology. This course will also familiarize with the green chemistry, environmental issues and analytical techniques.
13.	P2CHTC302	Nano-Chemistry	The aim of this course is to inculcate the knowledge among students related to the basics of Nano-materials, their synthesis, characterization, properties and applications. The course will have employability in the industry, research and academic fields.
14.	P2CHTC303	Bioorganic and Medicinal Chemistry	The aim of this course is to let the students understand enzymatic action, coenzymes, chemistry of vitamin B complex, co-crystals, carbohydrates metabolism, drug design, chemistry of antibiotics, mechanism of action of vitamins etc. This paper has scope of employability in medicinal chemistry and as scientist in research laboratories.
15.	P2CHTE304	Analytical Chemistry	This course is aimed to have an insight of various analytical techniques in analyzing the chemicals quantitatively. After completing this course, students will be employable in R & D divisions of Industries Research and Academic Institutes.
16.	P2CHTE305	Spectroscopy and Photochemistry in Inorganic Chemistry	This course is aimed to have an insight of various spectroscopic tools in analyzing the inorganic molecules/complexes. The ligand field photochemistry is also a part of the course. After completing this course, students will be employable in R & D divisions of Industries Research and Academic Institutes.
17.	P2CHTE306	Heuristic Approach to Organic Synthesis	On successful completion of this course, the students will gain knowledge about disconnection approach, planning the synthesis of organic compounds and natural products, photochemistry and asymmetric cycloaddition reactions. The learning from this course will help the students to get jobs in R & D laboratories. pharmaceutical industry and academics.
18.	P2CHTE307	Chemistry of Natural Products	After successful completion of this course, the student will gain knowledge about various natural products such as terpenoids, carotenoids, alkaloids, steroids, plant pigments and marine natural products, and their biosynthetic pathways.
19.	P2CHTE308	Thermodynamics and Statistical Mechanics	This course will be useful in understanding the non-equilibrium thermodynamics, transport phenomenon, thermodynamics of mixtures, statistical mechanics / thermodynamics and their applications.
20.	P2CHTE309	Chemistry of Materials and Liquids	Students will acquaint knowledge about chemistry of different materials like alloys, ceramics, composites and liquid crystals. The properties of liquids along with the various theories of liquids also form a part of discussion in this course. This course also offers employability in the field of research and development, research institutes besides academics.
21.	P2CHPE310	Practical Course in Inorganic Chemistry	This course aims to develop an understanding of synthesis, quantitative and qualitative analysis, separation of cations by Paper, Thin layer and Column chromatography. The students will also be trained to prepare and characterise the compounds using the available

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			techniques.
22.	P2CHPE311	Practical Course in Organic Chemistry	In this course, students will be trained to employ critical thinking and the scientific method to design, carry out, record and analyze the results of chemical experiments and get an awareness of the impact of chemistry on the environment and, society. This paper has scope of employability in academics and in research institution and pharmaceutical industries.
23.	P2CHPE312	Practical Course in Physical Chemistry	Students will employ critical thinking and the scientific method to design, carry out, record and analyze the results of chemical experiments and get an awareness of the impact of chemistry on the environment, society, and other cultures outside the scientific community. There will also be a course based on review of literature on any modern scientific topic.
24.	P2CHMO351	Title of the MOOC/SWAYAM course opted by students	<p>Course Objectives:</p> <ul style="list-style-type: none"> • To provide the students high quality learning experience using multimedia on anytime, anywhere basis. • To acquaint the students with online mode of learning using ICT platform. • To diverse the knowledge of students through open learning and help them to access different disciplines online and thus promoting interdisciplinary knowledge. • To provide the students a hybrid model of learning that adds to the quality of classroom teaching.
25.	P2CHTE401	Organotransition Metal Chemistry	This course will enable the students to learn basic concepts, different bonding behaviour, synthetic and structural aspects of transition metal-carbon bond. Students will also gain the knowledge of applications of these compounds in various fields as catalyst with full understanding of their mechanism.
26.	P2CHTE402	Bioinorganic and Supramolecular Chemistry	The focus of this course is to enable the students to learn about the bioinorganic and molecular recognition and design of molecules for the beneficial of society.
27.	P2CHTE403	Chemistry of Heterocyclic Compounds	An exhaustive study of heterocyclic chemistry will be presented which will help the students to grasp its chemistry. This paper includes the different types of reaction mechanism in the preparation of different ring size heterocyclic compounds and also their biological importance. This will help students to get employability in Research and Development.
28.	P2CHTE404	Catalysis in Organic Synthesis	On successful completion of this course, the students will gain knowledge about asymmetric catalysis including organocatalysis and metal catalysis. This will train the students to perform asymmetric organic transformations. In addition, the learning from this course will help the students to get employment in industry and academia.
29.	P2CHTE405	Solid State Chemistry	The students will have an understanding of general principles of solid state reactions, preparation, methods and crystal symmetry, defects/structure of solids and their electronic, ionic conduction and magnetic properties.
30.	P2CHTE406	Polymer Chemistry	Basic aspects of polymer chemistry and their characterization, structure and properties of polymers, polymer processing and properties of commercial polymers are discussed in this course work.
31.	P2CHPE407	Project in Inorganic Chemistry	The Projects have been designed so as to provide exposure to students in various experimental aspects of Inorganic Chemistry. After completing this course, students will be employable in R & D divisions of Industries Research and Academic Institutes.
32.	P2CHPE408	Project in Organic Chemistry	The Projects have been designed so as to provide exposure to students in various experimental aspects of Organic Chemistry. After completing this course, students will be employable in R & D divisions of Industries Research and Academic Institutes.
33.	P2CHPE409	Project in Physical Chemistry	The Projects have been designed so as to provide exposure to students in various experimental aspects of Physical Chemistry. After completing this course, students will be employable in R & D divisions of Industries Research and Academic Institutes.