

**Chanda Shikshan Prasarak Mandal's
JANATA MAHAVIDYALAYA, CHANDRAPUR
DEPARTMENT OF CHEMISTRY
PG CHEMISTRY DEGREE PROGRAM
Program specific outcomes (PSOs), Course outcomes (COs)**

After completion of M.S. Chemistry program students will -

PSO1: Gain complete knowledge about all fundamental aspects of all the elements of chemistry.

PSO2: learn about the potential use of analytical industrial chemistry, green chemistry and medicinal chemistry.

PSO3: gathers knowledge about physical aspects of atomic structure, dual behavior, reaction pathways with respect to time, various energy transformations, significance of electro chemistry and molecular segregation using their symmetry.

PSO4: learn the importance of various elements present in the periodic table, coordination chemistry and structure of molecules, properties of compounds and structural determination of complexes using theories and instruments.

PSO5: Carry out experiments in the area of organic analysis, estimation, separation, derivative process, inorganic semi-microanalysis, preparation, conductometric and potentiometric analysis thus developing research aptitude and employability skills.

COURSE OUTCOMES

Class- M.Sc. SEMESTER-I

PAPER 1: INORGANIC CHEMISTRY

SUBJECT CODE: CH 101

CO1: After completion of this course the students will develop an advance level of understanding and basic knowledge about various theories and concepts in inorganic chemistry.

CO2: The students will be able to learn, interpret and develop research abilities.

PAPER 2: ORGANIC CHEMISTRY

SUBJECT CODE: CH 102

CO1: After completion of this course the students will develop and be able to write mechanism of reaction.

CO2: They will become aware of various chemicals reagents used in chemical reaction in organic transformation and conversion.

CO3: Students will learn various concepts in stereochemistry and acquire skills to identify stereo chemical aspects of molecules, nature and bonding in various organic molecules.

PAPER 3: PHYSICAL CHEMISTRY

SUBJECT CODE: CH 103

CO1 After completion of this course the students will be able to understand about various physical concepts and their importance through quantum mechanics, classical thermodynamics, phase Equilibria and chemical kinetics.

PAPER 4: ANALYTICAL CHEMISTRY

SUBJECT CODE: CH 104

CO1: After completion of this course the students will be able to understand about qualitative and quantitative analysis and various techniques used for analysis purpose such as chromatography, gravimetric analysis and spectrophotometers.

CO2: By studying analytical chemistry, students will gain information about working of instruments.

PRACTICAL – 1 (INORGANIC CHEMISTRY)

SUBJECT CODE: CH 105

CO1: At the end of course student will be able to separate and perform semi-micro analysis of inorganic mixture and also, will become expert in quantitative and qualitative analysis.

PRACTICAL – 2 (ORGANIC CHEMISTRY)

SUBJECT CODE: CH 106

CO2: At the end of course student will be able to separate and identify the organic mixture and also, will become expert in organic synthesis.

SEMINAR 1: CH 107

CO1: Students will be able to gain deep knowledge about given specific topic and develop teaching skill.

M.SC SEMESTER II**PAPER5: INORGANIC CHEMISTRY****SUBJECT CODE: CH 201**

CO1: After completion of this course students will be able to understand about the electronic spectra of transition metal complex, their magnetic properties, and their reaction mechanisms and about metal-pi complexes.

PAPER 6: ORGANIC CHEMISTRY:**SUBJECT CODE: CH 202**

CO1: After completion of this course students will be able to gain knowledge about carbon- carbon multiple bonds, mechanism of molecular arrangement, free radical reactions and about green chemistry.

PAPER 7: PHYSICAL CHEMISTRY**SUBJECT CODE: CH 203**

CO1: After completion of this course students will gain knowledge about application of quantum mechanics, thermodynamics, solid state chemistry and nuclear chemistry.

PAPER 8: ANALYTICAL CHEMISTRY**SUBJECT CODE: CH 204**

CO1: After completion of this course students can understand and gain knowledge about sampling and process used for it, chromatographic techniques, and optical methods used for analysis and electrochemical methods used for analysis.

PRACTICAL – 3 (PHYSICAL CHEMISTRY)

SUBJECT CODE: CH 205

CO1: At the end of course student will gain information about chemical kinetics experiments, volume contraction and CST.

PRACTICAL – 4 (ANALYTICAL CHEMISTRY)

SUBJECT CODE: CH 206

CO1: At the end of course student will gain information about various instrumental technics.

SEMINAR 2: CH 207

CO1: Students will be able to gain deep knowledge about given specific topic, develop teaching skill.

M.SC SEMESTER III

PAPER 9: SPECTROSCOPY

SUBJECT CODE: CH 301

CO1: After completion of this course the students will be able to understand about the symmetry of molecules and group theory, mass spectroscopy, Mossbauer, microwave spectroscopy, infrared and Raman spectroscopy in detail.

PAPER 10: SPECIAL 1- ORGANIC CHEMISTRY

SUBJECT CODE: CH 302

CO1: After completion of this course the students will be able to gain knowledge about photochemistry, pericyclic reaction and all types of oxidation and reduction reactions and the chemistry of P, S, Si, B, Ti compounds.

PAPER 11: SPECIAL 2- ORGANIC CHEMISTRY

SUBJECT CODE: CH 303

CO1: After completion of this course the students will be able to understand deeply about the structures and composition and various synthesis methods in terpenoids, alkaloids, and steroids and know about plant pigments. Carbohydrate and detail knowledge about amino acids and peptides.

PAPER 12: ELECTIVE POLYMER CHEMISTRY**SUBJECT CODE: CH 304**

CO1: After completion of this course the students will be able to understand about polymers, its classification and types. It also deals with the molar mass determination of polymer.

CO2: Student will gain knowledge about physical properties of polymer and also studied in a detail about various commercial polymer.

PRACTICAL – 5 (ORGANIC CHEMISTRY SPECIAL)**SUBJECT CODE: CH 305**

CO1: At the end of course student will be able to develop skill in organic synthesis.

PRACTICAL – 6 (POLYMER CHEMISTRY)**SUBJECT CODE: CH 306**

CO1: At the end of course student will be able to develop skill in polymer synthesis.

SEMINAR 3: CH 307

CO1: Students will be able to gain deep knowledge about given specific topic, develop teaching skill.

M.SC SEMESTER IV

PAPER 13: SPECTROSCOPY

SUBJECT CODE: CH 401

CO1: After completion of this course the students will be able to understand about different spectrographic methods used for different analysis such as NMR, UV-VISIBLE, diffraction techniques.

PAPER 14: SPECIAL 1 ORGANIC CHEMISTRY

SUBJECT CODE: CH 402

CO1: After completion of this course the students will be able to gain knowledge about carbanions and organometallic reagents in detail and about advanced spectrochemistry and retrosynthesis.

PAPER 15: SPECIAL 2 ORGANIC CHEMISTRY

SUBJECT CODE: CH 403

CO1: After completion of this course the students will be able to study about enzymes and their mechanism, about different heterocyclic compound, nucleic acids and mechanism of dyes and their nature and about drugs and their properties.

PAPER 16: ELECTIVE POLYMER CHEMISTRY

SUBJECT CODE: CH 404

CO1: After completion of this course the students will be able to know about different polymerization techniques, their characteristics, and about biomedical polymers, inorganic and coordination polymer.

PRACTICAL – 7 (ORGANIC CHEMISTRY SPECIAL)

SUBJECT CODE: CH 405

CO1: At the end of course student will be able to develop skill in organic synthesis.

PRACTICAL – (PROJECT)

SUBJECT CODE: CH 406

CO1: Students will develop research ability and try to solve research problem.

SEMINAR 3: CH 407

CO1: Students will be able to gain deep knowledge about specific topic, develop teaching skill.