

M.Sc. Organic Chemistry

Programme outcome

1. Determine molecular structure by using UV, IR and NMR.
2. Study of medicinal chemistry compound.
3. Improve the Skill of student in organic research area.
4. Synthesis of Natural products and drugs by using proper mechanisms.
5. Study of Asymmetric synthesis.
6. Determine the aromaticity of different compounds.
7. Solve the reaction mechanisms and assign the final product

Programme Specific Outcome

1. Know the structure and bonding in molecules/ ions and predict the Structure of molecule/ions.
2. Understand the various type of aliphatic, aromatic, nucleophilic substitution reaction.
3. Understand and apply principles of Organic Chemistry for understanding the scientific phenomenon in Reaction mechanisms.
4. Learn the Familiar name reactions and their reaction mechanisms.
5. Understand good laboratory practices and safety.
6. Study of organometallic reactions.
7. Study of free radical, bicyclic compound, conjugate addition of Enolates and pericyclic reactions.

Course Outcome

Course Code	Name of Course	Outcome
CHE-101	Analytical chemistry	1) Student know the quantitative & qualitative analysis 2) Under stand the basic concept of analytical chemistry. 3) Know basic separation techniques.. 4) Understand chromatographic techniques such as TLC , Liquid- Liquid partition chromatography , Coloumn chromatography , Gel permeation , ion exchange , Gas & High performance liquid chromatography.
CHE-102	Inorganic Chemistry	1)To enable the students understand the group theory & symmetry concept ,

		2) The students learn more about the reaction mechanism of transition metal complexes 3) Student Learn metal ligand equilibria in solution 4) Understand the inorganic chemistry in biological system.
CHE-103	Organic Chemistry	1) This course help the students to learn more about the nature of bonding in organic molecule 2) The students gain an idea about the various intermediates & mechanisms of reaction mechanism 3) They also gain skill in predicting the products of aliphatic nucleophilic and electrophilic substitution reactions. They become equipped to predict the mechanism of substitution reactions 4) They gain knowledge about the stereo aspects, R and S, E and Z nomenclature . .
CHE-104	Physical Chemistry	1) The syllabus provides a platform for students to learn the introductory aspects of ionic equilibria and biological reactions, Classical thermodynamics. 2) Students learn collision theory 3) They gain knowledge of surface and electro chemistry
CHE-205	Spectroscopic method of analysis	1) The student gain the knowledge of general introduction spectral method of analysis 2) The students acquire knowledge of vibrational and raman spectroscopy 3) They gain knowledge of ultra violet ,infrared , NMR spectroscopy.
CHE-206	Inorganic Chemistry	1) The students acquire knowledge about spectroscopic term symbol 2) The students also learn about the electronic spectra and magnetic properties of metal complex. 3) They learn preparation, properties, structure and bonding in metal complex . 4) They gain knowledge of metal nitrosyl compound and dioxygen and dinitrogen complexes.

CHE-207	Organic Chemistry	At the end of course students will 1) become aware the mechanisms of aromatic electrophilic & nucleophilic reactions. 2) develop an idea about addition to carbon- carbon multiple bonds. And addition carbon- hetero multiple bonds. 3) The students familiar with the elimination reaction. 4) They gain knowledge about the various rearrangements.
CHE-208	Physical Chemistry	1) To enable the students to understand more about quantum chemistry . 2) They learn phase rule 3) They gain knowledge of crystallography . 4) Student understood the concept photochemistry.
CHE-209	Laboratory course – General & Analytical	1) The student determines the saponification value of oil. 2) The syllabus provides a platform for students to perform various experiment .
CHE-210	Laboratory course -Inorganic Practical's I	1) The students acquire skill in semi micro qualitative inorganic analysis, separation and estimation of metal ion 2) The also learn to prepare paper chromatography.
CHE-211	Laboratory course - Organic Practical's I	At the end of course student will, 1) Know about separation and identification of solid-solid, solid-liquid and liquid-liquid organic binary mixture. 2) Know about analysis of type of organic mixture. 3) Know the method and practical skill for individual analysis of organic compound. 4) Know about preparation of single stage derivative and practical method of purity checking.(Physical constant and TLC)

		5) To enhance the practical knowledge about binary mixture separation and single stage preparation reaction.
CHE-212	Laboratory course - Physical Practical's I	1) The students acquire hands on experience to do experiments related to instrument and non-instrument.
CHEO-313	Structural elucidation by spectral methods	The students gain knowledge & develop skill in interpreting and analysing various spectra like IR, NMR & Mass. 1) To study ^1H NMR Spectroscopy like Chemical Shift, shielding-desielding, spin systems etc. 2) To understand the factors affecting UV-absorption spectra, Interpret IR spectra on basic values of IR-frequencies. 3) To discuss and solve the problems of UV, IR and NMR, 4) To study ^{13}C NMR spectroscopy: FT- NMR, type of ^{13}C NMR 5) To discuss and solve the problem of mass spectroscopy 6) To study mass spectrometry like Instrumentation, various methods of ionization, SIMS, FAB, MALDI. Different detectors rules of fragmentations of different functional groups. 7) To understand ^2D NMR techniques: COSY, homo and hetero nuclear 2D resorts spectroscopy, NOESY and the applications 8) To study Mossbauer spectroscopy & electron spin resonance spectroscopy
CHEO-314	Organic Synthesis	At the end of course student will 1) Know how to carry any organic transformation. 2) Know the different Reagents to carry any organic transformation. 3) Know about Reactive intermediate to carry organic synthesis. 4) Suggest the organic pathway.

CHEO -315	Asymmetric synthesis and Bio-organic chemistry.	1) At the end of course student will be able to: 2) know classifications of enzymes. 3) understand about specific and non specific enzymes 4) understand structure and properties of enzymes. 5) understand different organic transformations enzymatically. 6) understand various ways of attack on electrophilic species by a nucleophile 7) predict enantioselective product. 8) understand mechanisms in asymmetric reaction. 9) visualise 3D structure of molecules. develop interest in Asymmetric synthesis of naturally occurring essential compounds
CHEO-316	Photochemistry, Free radicals and Pericyclic reactions.	After successfully completing this course, students will be able to: 1) Understand the woodwrod and hoffmanns rule of pericyclic. 2) understand various Pericyclic and photochemical reactions and rearrangements. 3) understand and write mechanism of reactions and their applications. 4) utilize their knowledge in practical's for various heterocyclic and photochemical conversions.
CHEO-417	Organic Synthesis: Retrosynthesis Approach	At the end of the course student will, 1) Know the basic concept of Retro synthesis such as Target Molecule, Disconnection, functional group inter conversion, synthon, synthetic equivalent etc. 2) Work independently on Retro analysis and synthesis of Target Molecule. 3) Apply their knowledge of organic synthesis so that novel method for synthesis of known Target Molecule can be done.
CHEO-418	Advanced Organic and Heterocyclic Chemistry.	After successfully completing this course, students will be able to: 1) understand various name reactions and rearrangements. 2) understand various name reagents and catalysts.

		3) understand and write mechanism of reactions and their applications. 4) nomenclate the certain heterocyclic compounds. 5) understand how to synthesize five, six and seven-membered heterocycles.
CHEO-419	Chemistry of natural products	The students gain knowledge 1) To study classification, isolation, general method of structure determination of terpenoid & carotenoid. 2) To study the structure, stereochemistry and synthesis of terpenoids. 3) To study classification, isolation, general method of structure determination of alkaloid. 4) To study the Structure, stereochemistry and synthesis of alkaloid. 5) To synthesize natural compounds with mechanisms. 6) To study the structure, stereochemistry and synthesis of steroids, anthocyanin & flavones. 7) To know the structure and bonding in molecules or compounds. 8) To study the various name reaction with examples. 9) To determine the aromaticity of different compounds. 10) To synthesize Natural products and drugs by using proper mechanisms. 11) To solve the reaction mechanisms and assign the final product.
CHEO - 420(A)	Medicinal Chemistry	1) Helps in correlating between pharmacology of a disease and its mitigation or cure. 2) To understand the drug metabolic pathways, adverse effect and therapeutic value of drugs 3) To know the structural activity relationship of different class of drugs.

		4) Well acquainted with the synthesis of some important class of drugs. 5) Knowledge about the mechanism pathways of different class of medicinal compounds. 6) To understand the chemistry of drugs with respect to their pharmacological activity.
CHEO -421	Laboratory Course(Analysis of ternary Mixture)	At the end of course students will 1) Able to analysis organic compounds qualitatively. 2) Know how to find type & separate organic ternary mixtures. 3) Able to find saturated or unsaturated compound 4) Know how to detect the elements present in organic compound by lassignes test. 5) Know how to determine functional group of an organic compound. 6) Know how to prepare suitable derivative of respective organic compound.
CHEO -422	Laboratory Course(Double Stage Preparation)	At the end of course student will know 1) How to run reaction at different physical conditions 2) How to monitor a reaction with the help of TLC 3) How to do workup the reaction and isolation of final product. 4) How to check quality of product formed by comparing physical constants.
CHEO -423	Laboratory Course (Spectral analysis and experimental)	1) This course helps the students to experience the separation techniques like solvent extraction and thin layer chromatographic techniques and also enable them to synthesize organic compounds by single stage using green protocol. 2) To study different green chemistry techniques.

		3) To know structure elucidation by spectral analysis data.
CHEO -424	Research Project (Dissertation & Presentation)	At the end of this Project work student will Know 1) how to do literature survey 2) How to do mole calculation for reaction 3) How to put a reaction, its monitoring by TLC, its workup and isolation of final product. 4) Different Purification Techniques such as crystallization, column chromatography, distillations, Preparative TLC etc. 5) Different green techniques in organic synthesis. 6) How to summarize all data 7) How to write introduction, result discussion, summary, conclusion and references for the research work. 8) How to present research work.