

COURSE OUTCOMES

The course outcomes are specified by Shivaji University, Kolhapur

M. Sc. Organic Chemistry:

Course	Outcome
CH-1.1 (Inorganic Chemistry – I)	<ol style="list-style-type: none">1. Students will be able to explain the basic chemistry of transition metals and its compounds, spectroscopic characteristics of such compounds, nomenclature, reactions and applications.2. Students will obtain knowledge about Preparation, structure, physical and chemical properties of metal carbonyls of transition metals.3. Students will be able to understand the all aspects of synthesis, bonding, structure and reactivity of organo-metallic compounds and their applications in homogenous catalysis.4. Student will be able determine the stability of the complexes and will be able to explain the nuclear stability and reactions.
CH-1.2 (Organic Chemistry – I)	<ol style="list-style-type: none">1. Students will able to differentiate between various organic reactive intermediates.2. Students can recognize, classify, explain, and apply fundamental organic reactions.3. Students will have ability to distinguish between different kinds of isomers.4. Course will develop interest in writing and finding mechanisms of new reactions.
CH-1.3 (Physical Chemistry – I)	<ol style="list-style-type: none">1. Students will be able to understand basic principles of thermodynamics and statistical mechanics. Able to learn advanced topics like quantum statistics and molecular dynamic simulation methods.2. Develop abilities to understand how to estimate and analyze the physicochemical properties of condensed and gas phase materials. Able to utilize spectral data to estimate molecular thermodynamic properties through partition function calculations.3. Learns the principles and techniques to understand gas and liquid adsorptions on solid surfaces. Learn spectral techniques to study surface adsorption phenomena.4. Learn principles and techniques for estimation of average molecular weight of a polymer or biological macromolecules CO9: Develop abilities to characterize polymers.

<p>CH-1.4 (Analytical Chemistry – I)</p>	<ol style="list-style-type: none"> 1. Students would acquire the knowledge about the fundamentals of Analytical Chemistry including the sampling, sample pretreatment, basic techniques, methods and data handling, processing and statistical analysis of the same. 2. Students would acquire the knowledge and understand the scope of Analytical Chemistry spanning various fields. The students will learn fundamentals of qualitative analysis using conventional techniques 3. Students will learn the chromatographic techniques, electroanalytical techniques and computation chemistry which would groom them for alternative analytical strategies which form one of the important components of analytical chemistry. 4. Students will learn about referring to the standard reference books and infer information from the same. Analytical case study problems would be discussed to familiarize with the scope and advantages of Analytical chemistry.
<p>CHP-1.1- I</p>	<ol style="list-style-type: none"> 1. Students will prepare One stage organic preparations involving various types of reactions 2. Know estimations 1.Estimation of unsaturation. 2.Estimation of formalin. 3.Colorimetric Estimation of Dyes 4.Estimation of Amino acids. 3. Separation and identification of organic compounds in binary mixtures. Preparation of its derivatives. 4. Analyze ores and alloys gravimetrically and volumetrically. Prepare various inorganic complexes and determination of its Percent purity.
<p>CH-2.1 (Inorganic Chemistry – II)</p>	<ol style="list-style-type: none"> 1. Students will get the knowledge of the basic chemistry of non-transition elements and their compounds, synthesis and structural features and applications. 2. To be able to explain the structures of inorganic compounds based on different theories. Student will understand the chemistry of various types of solvents. 3. Be well versed with the knowledge about the chemistry of Lanthanides and Actinides with respect to occurrence, separation, compounds and applications. 4. To understand the three dimensional structures of solid-state materials of industrial importance and to get the knowledge of bio-inorganic Chemistry.

<p>CH-2.2 (Organic Chemistry – II)</p>	<ol style="list-style-type: none"> 1. Illustration of modern synthetic methods and applications of reagents. 2. Provide knowledge of different organometallic compounds and various coupling reactions. 3. Understand principle and applications of protection and deprotection of various functional groups. 4. It will elaborate to understand the concept of chemo selectivity, regioselectivity and enantioselectivity.
<p>CH-2.3 (Physical Chemistry – II)</p>	<ol style="list-style-type: none"> 1. Students will learn basics of quantum mechanics. Able to understand selection rules and to predict the electronic spectra of conjugated organic molecules. Able to study photochemical and photophysical phenomena 2. Capable of qualitative and quantitative analysis of various ingredients from industrial, food and pharma samples using techniques of emission spectroscopy. 3. Capable of understand the electrochemical aspects of materials, ionic processes and electrochemical sensors, battery materials and characterizations etc. Able to study electrokinetic effects and their applications in the field of protein separation, characterization etc. 4. Understanding the molecular dynamics through kinetic studies. Applications to explore reaction pathways, protein-ligand binding rates, etc. will help to understand life governing processes.
<p>CH 2.4 Analytical Chemistry- II</p>	<ol style="list-style-type: none"> 1. Students will acquire the knowledge of spectroscopic tools/instruments used in chemical analysis and interpretation of the data. 2. Students will learn about the simple and advanced instruments used for analysis like NMR, MS, AAS, ICP and thermal analysis (TGA, DTA, DSC etc.) 3. Students will learn about the instrumentation, sample preparation and handling of sample, analysis and data interpretation and structural elucidation. 4. Learning about different instruments will give them idea about appropriate choice of the instrument for analysis based on the source and type of analyte(s) in the sample under consideration.

CHP-2.1- II	<ol style="list-style-type: none"> 1. Student can be able to prepare various concentration solutions like molar, normal, ppm, etc 2. Students can be able to know how to verify Beer-Lambert's Law for potassium permanganate and Dye solution and hence to determine the molar extinction coefficient and unknown concentration of given sample colorimetrically. 3. Students can be able to know how to estimate anion, cation or compound in given analyte by colorimetry, Potentiometry, Conductometry, Refractometry, pH – metry, ion exchange chromatography etc. 4. To know the Chemical Kinetics procedure, Adsorption procedure and Viscosity procedure for quantitative analysis.
Paper IX OCH-:3.1 Organic Reaction Mechanism	<ol style="list-style-type: none"> 1. Compare the major and minor product of variety of organic reaction. Understand accepted mechanism of organic reaction including all intermediates and the kinetic and non-kinetic methods for reaction mechanisms. 2. Solve the problems on Taft and Hammett constant. Understand Concave upward and downward deviation. 3. Solve problems on photochemical reactions. 4. To understand the concept of pericyclic reactions.
OCHP 3.1 Practical III	<ol style="list-style-type: none"> 1. Know qualitative Analysis Separation, purification and identification of compounds of ternary mixture (one liquid and two solids) using the TLC, column chromatography, chemical tests. 2. IR spectra to be used for functional group determination. 3. Identification, know Three step Preparation 4. Know Colorimetry and pH metry experiments.

Part-II Semester-IV

OCH 4.1 Paper No. -XIII Theoretical Organic Chemistry	<ol style="list-style-type: none"> 1. To Know concept of aromatic, anti-aromatic and non-aromatic compounds. Classify the compounds into the above categories. 2. Learn the synthesis of various non-benzenoid aromatic compounds. 3. Understand the kinetic and thermodynamic control of reactions. 4. To understand the concept of non-classical carbocation. To learn the mechanism involved in free radical reactions.
OCH 4.2: -Paper- XIV Stereochemistry	<ol style="list-style-type: none"> 1. Understand new methods of stereo selective synthesis such as enantio-selective. 2. Understand Stereochemistry of acyclic and alicyclic compounds. 3. Understand stereochemistry of the ring system, conformation and configuration, Fused and bridged rings fused bicyclic ring systems, O.R.D. and C.D.:Types of curves 4. Understand Stereochemistry of compounds containing no chiral carbon atoms and diastereo isomerism (Geometrical isomerism)..
OCH 4.3 Paper No.-XV Chemistry of Natural Products	<ol style="list-style-type: none"> 1. Student will be able to classify the natural products, Terpenoids, alkaloids, steroids etc. 2. Understanding introduction and structure determination of natural products like Alkaloids. 3. Understanding introduction and structure determination of natural products like steroids. 4. Understanding biogenesis of natural products.
OCH 4.4 (A) :Paper No. -XVI- Applied Organic chemistry	<ol style="list-style-type: none"> 1. To study various carbamate and organo phosphorous pesticides. 2. Understanding introduction and structure of juvenile hormone. Study the application of vaniline. 3. Study of manufacture of furfural from bagasse. 4. Classification and synthesis of important dyes. Study of natural polymer and application of Oxo and Wacker process.

OCHP-4.1 Practical IV	<ol style="list-style-type: none"> 1. Learn to separate organic compounds in different phases. Perform qualitative test to analyze functional group, elements of organic compounds. Use of distillation techniques of organic compounds. 2. Understand two step synthesis of organic compound. 3. Understand multistep synthesis. 4. Preparation of Project on selected topic.
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