Singareni collieries Women's Degree college, Kothagudem.

Department of Chemistry

2021-22(Even)

Learning objectives and Outcomes

B.Sc.-1st Semester

Subject - Inorganic Chemistry

Learning Objectives

1. To understand the shapes of different orbitals.
2. To understand different principles for filling electrons.
3. To understand how to draw energy diagrams.
4. To understand how to calculate bond order.
5. To Understand the structure and properties of Boranes, Carbides and Nitrides.

Learning Outcomes

1. Able to write electronic configuration of given atomic number.
2. Able to tell the name of orbitals by recognizing shapes of orbitals.
3. Able to calculate bond order of different molecules.
4. Able to draw MO diagrams of different molecules.
5. Able to draw structures of different Boranes, Carbides and Nitrides .
6. Able to write the reactivity - Hydrolysis of P - Block elements

Singareni collieries Women's Degree college, Kothagudem.

Department of Chemistry

2021-22(Even)

Learning Objective & Outcome

B..Sc.- 1st Semester

Subject: Physical Chemistry

Learning Objective

1. Students will be able to describe the concept of pressure from a macroscopic and microscopic perspective.
2. Students will describe the atomic structure and elementary quantum mechanics .

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3. The students will be able to compare and contrast the relationship between critical constant and vanderwall's constant.
4. The students will be able to classify structural difference s between Solids, Liquids and Gases.
5. The students will be able to classify matter by its state and bonding behaviour using the periodic table as a reference.

Learning Outcomes

1. Students should be able to describe the characteristic of the three states of matter.
2. Students should be able to describe the different physical properties of each state of matter.
3. Students should be able to determine the difference between solids, liquids and gases.
4. Students will be able to define what matter is and where you can find it.
5. Students will be able to give examples of solids, liquids and gases.

Department of Chemistry

Learning Objective & Outcomes

B.Sc - 1st Semester

Subject : Organic Chemistry

Learning Objective

1. To understand the core concepts of organic chemistry i.e. resonance, hyperconjugation, inductive effect etc. and their application.
2. To study about the Inductive effect, basicity of Amines .
3. To understand stability of Carbocations.
4. To acquire basic knowledge of reactive intermediates and mechanism of organic reactions.
5. To study about nomenclature, synthesis, isomerism and physical properties of alkanes, alkenes, alkynes and cycloalkanes.

Learning Outcomes

Upon successful completion of this course, the student will be able to

1. Recognize hyperconjugation and uses of inductive effect.
2. Know the fundamental principles of organic chemistry and predict outcomes and derive mechanism of various types of organic reactions.
3. Understand various types of reactive intermediates and factors affecting their stability of Carbo cations .
4. Understand the nomenclature, synthesis, isomerism and physical properties of alkanes alkenes, alkynes and cycloalkanes

Department of Chemistry

Learning Objective & Outcomes

B.Sc - 1st Semester

Subject : General Chemistry

Learning Objective

1. To study about the isomerism and types of isomerism.
2. To understand optical isomerism, geometric isomerism and conformational isomerism.
3. To acquire basic knowledge of loss of crystallography.
4. The students will be able to classify derivation of Bragg's equation.
4. The students will be able to draw the structure of Nacl, Kcl and Cscl.
5. To study about the general principles of Inorganic qualitative analysis.

Learning Outcomes

1. Recognize and draw constitutional isomers, stereoisomers, including enantiomers and diasteromers, racemic mixture and meso compounds .
2. Know the fundamental principles of organic chemistry and predict outcomes and derive mechanism of various types of organic reactions.
3. Understand various types of reactive intermediates and factors affecting their stability .
4. Understand the loss of crystallography.
5. Students should be able to describe the characteristic of the Bragg's equation.
6. Able to analyse and identification of anions and cations

Singareni collieriesWomen's Degree college,

Department of Chemistry

2020-2021(Even)

Learning Objective & Outcomes

B.Sc. - 2nd Semester

Subject : Inorganic Chemistry

Learning Objective

1. The purpose of study semiconductor devices and materials is to familiarize students with P-N junction and transistors.
2. The students will be able to understand general trends in the chemistry behind p-block elements.
3. The students will be able to know the important compounds and important applications of compounds of boron and carbon.
4. The students will understand the biological significance of sodium ,potassium, magnesium and calcium.
5. The students will be able to explain large scale preparation and properties of industrially viz., cement, plaster of paris, sodium hydroxide, sodium carbonate and bicarbonate etc.
6. The students will be able to describe the salient features of alkali and alkaline earth metals.

Learning Outcomes

1. The students will be able to design and carry out scientific experiments as well as accurately record and analyse the results of experiments.
2. Students will be able to explain why chemistry is an integral activity for addressing social, economic and environmental problems.
3. Students will be skilled in problem solving, critical thinking and analytical reasoning as applied to scientific problems.
4. The students will be able to describe the periodic table as a list of elements arranged so as to demonstrate trends in their physical and chemical properties.
5. The students will able to state the principle resemblances of elements within each main group in particular alkali metals, alkaline earth metals , halogens and noble gases.

Department of Chemistry

2021-22 (Even)

Learning Objective & Outcomes

B.Sc.(Chemistry) 2nd Semester

Subject : Physical Chemistry

Learning Objective

1. To describe a electrode reaction , cell EMF and application of EMF.
2. To write a general form of Galvanic cells and representation of electrochemical cells.
3. To determine integrated rate expression for zero order, first order, second and third orderreaction and their respective half life period expressions.
4. To study the various factors which affect the rate of a chemical reaction such as concentration ,temperature, solvent, catalyst etc. And theories of chemical kinectics.
5. acquire basic knowledge of electrode conduction.
6. determine the solubility of sparingly soluble salts.
7. explain the various methods for the determination of transport number.

Learning Outcomes

Upon successful completion of this course, the student will be able to

1. State the basic principles electrochemistry.
2. Mention and explain various methods for the determination of transport number.
3. Explain the concepts of electrolytic conduction and dilution
4. Understand reaction EMF and single electrode potential .
5. Derive Gibbs free energy and Helmholtz free energy .
6. Calculation of solubility product of Agcl..

Department of Chemistry

2021-2022 (Even)

Learning objectives and Outcomes

B.Sc.-2nd Semester

Subject-Organic Chemistry

Learning objectives

1. To understand the methods for preparation of alcohols.
2. To understand the different classes of alcohols.
3. To understand the structure of carboxylic acid and their derivatives.
4. To understand the reactivity of different carboxylic acid derivatives.
5. To understand the chemical reactions of phenols.

Learning outcomes

1. Able to recognize structures of acid halides, esters, amides, acid anhydrides.
2. Able to convert given name of alcohol to structure.
3. Able to write the order of reactivity of different carboxylic acid derivatves.
4. Able to describe different classes of alcohols.
5. Able to write down structure of phenol and phenoxide ion.

Department of Chemistry

2021-2022 (Even)

Learning objectives and Outcomes

B.Sc.-2nd Semester

Subject : General Chemistry

Learning objectives

1.To understand the types symmetry and asymmetric molecules.

2. To understand the chiral molecules and R, S - configurations .

3. To understand the Cahn –Ingold- Prelog rules.

4. To understand the colligative properties dilute solutions.

5. To understand the derivation of relation between molecular weight and elevation in boiling and freezing point .

Learning outcomes

1. Able to recognize structures of Chiral moleculs.

2. Able to classify the different types of symmentry moleculs.

3. Able to write the definition , configuration and structure of Lactic acid and Alanine .

4. Able to write colligative properties of dilute solutions .

5. Able to derive the Raoult's Law.

Singareni collieries Women's Degree college,

Department of Chemistry

2021-2022 (Odd)

Learning Objective & Outcome

B.Sc.- 3rd Semester

Subject: Inorganic chemistry

Learning Objective

1. In order to study transition metals to understand the trends in properties and reactivity of the d-block elements.
2. To explain the typical physical and chemical properties of the transition metals.
3. To identify simple compound classes for transition metals and describe their chemical properties.
4. To understand the concepts of metal ligand bonding in transition complex compounds.
5. To understand the thermodynamics and kinetic aspects of metal complexes.
6. To understand the nomenclature, classification, properties and preparations of coordination compounds.
7. To understand the chemistry of organometalic compounds, homogenous hydrogenation and carbonyls.

Learning Outcomes

1. The students will be able to explain the fundamental concepts in coordination chemistry of transition metals.
2. Recognize the bonding in transition compounds by VBT and CFST theories.
3. Able to predict the geometry of coordination compounds and type of hybridization.
4. Able to determine the properties and preparations of Li, Al, Hg, Sn, Ti etc. metal compounds.

Department of Chemistry

2021-22 (Odd)

Learning Objective & Outcomes

B.Sc. - 3rd Semester

Subject : Physical chemistry

Learning Objective

1. To understand thermodynamic terms: system, surrounding etc. Types of systems, intensive and extensive properties. State and path functions and their differentials.
2. To understand Heat capacity, heat capacities at constant volume and pressure and their relationship. Joule's law
3. To understand the concept of equilibrium constant, free energy, chemical potential
4. To understand the Nernst distribution law – its thermodynamic derivation, modification of distribution law when solute undergoes dissociation, association and chemical combination. Applications of distribution law
5. To understand the determination of entropy and Carnot's cycle.
6. To understand Laws of Thermodynamics.

Learning Outcomes

After the completion of the course, Students will be able to

1. Recognize the basic terms of thermodynamic.
2. Able to predict the energy change in heat capacities at constant volume and pressure and their relationship.
3. Able to drive Joule's law and its application.
4. Able to derive relationship between reversible Isothermal process and reversible entropy of mixing ideal gases.
5. Able to recognize the derivation of $\Delta G=\Delta H -T\Delta S$.

Department of Chemistry

2021-2022 (Odd)

Learning objectives and Outcomes

B.Sc.-3rd Semester

Subject-Organic Chemistry

Learning Objectives

1. To understand the methods for preparation of Nitrohydrocarbons.
2. To understand the different classes of Amines.
3. To understand the structure of carboxylic acid and their derivatives.
4. To understand the reactivity of different carboxylic acid derivatives.
5. To understand the chemical reactions of Cyanides and Isocyanides.

Learning Outcomes

1. Able to recognize structures of acid halides, esters, amides, acid anhydrides.
2. Able to convert given name of alcohol to structure.
3. Able to write the order of reactivity of different carboxylic acid derivatves.
4. Able to describe different classes of Amines.
5. Able to write down structure, Preparation and reactivity of Nitroalkanes.

Department of Chemistry

2021-2022 (Odd)

Learning objectives and Outcomes

B.Sc.-3rd Semester

Subject : General Chemistry

Learning objectives

1. To understand the experimental practice of Analytical data .
2. To understand the classification of Errors .
3. To understand the stability of Carbanions reactions .
4. To explain the Phase rule of one and two component .
5. To understand the Phase diagram of Nacl – H_20 .

Learning outcomes

1. Able to recognize determinate and indeterminate Errors.
2. Basic knowledge of Terminal alkynes.
3. Able to write the reactions and mechanism of Perkin, Benzoin condensation and haloform reactions .
4. Able to draw the Phase diagram of water system , Pb – Ag system.

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Department of Chemistry

2021-2022 (Even)

Learning Objective & Outcome

B.Sc - 4th Semester

Subject: Inorganic chemistry

Learning Objective

1. To understand the concepts of metal ligand bonding in transition complex compounds.
2. To understand the thermodynamics and kinetic aspects of metal complexes.
3. To understand the nomenclature, classification, properties and preparations of coordination compounds.
4. To understand the chemistry of Hard and Soft acids bases.
6. To understand the applications of Coordination compounds.
7. To understand the biological significance fo Na, K, Mg, Ni and Zn.

Learning Outcomes

1. Recognize the bonding in transition compounds by VBT and CFST theories.
2. Able to predict the geometry of coordination compounds and type of hybridization.
3. Able to determine the biological significance fo Na, K, Mg, Ni and Zn.
4. Able to recognize the biological reaction alkali and alkaline earth metals, nitrogenfixation, hemoglobin and myoglobin.
5. Able to classify the hard and soft Acids and Bases.

Department of Chemistry

2021-22 (Even)

Learning Objective & Outcomes

B.Sc. - 4th Semester

Subject : Physical Chemistry

Learning Objective

1. To describe a reaction rate in terms of a change in concentration divided by a change in time (at constant volume) and a general form of a (differential) rate law.
2. To write a general form of the rate law for any chemical reaction and define the order of a chemical reaction.
3. To determine integrated rate expression for zero order, first order, second and third order reaction and their respective half life period expressions.
4. To study the various factors which affect the rate of a chemical reaction such as concentration ,temperature, solvent, catalyst etc. And theories of chemical kinetics.
5. To learn depth Knowledge about photochemical reactions.
6. To make students familiar with a broad variety of photochemical system and their applications.

Learning Outcomes

After the completion of the course, Students will be able to

1. Understand rate of reaction and factors affecting it.
2. Derive integrated rate expressions for zero order ,first order ,second order and third order reaction.
3. Understand theories of reaction kinetics and differentiate them.
4. Recognize the difference between thermal and photochemical reactions.
5. Able to understand how to calculate quantum efficiency.
6. Defines phosphorescence and fluorescence.

Department of Chemistry

2021-2022(Even)

Learning objectives and Outcomes

B.Sc.-4th Semester

Subject-Organic Chemistry

Learning objectives

1. To describe the structure and properties of various types of Carbohydrates.
2. To understand the difference between Monosaccharides and Polysaccharides.
3. To learn about various methods of preparation and application of Amino acids.
4. To explain the mechanism of few selected reactions of Amino acids.
5. To explain the resonance structure of Heterocyclic compounds .

Learning outcomes

1. Students are able to recognize structure of different Carbohydrates.
2. Students are able to understand fundamental properties and reactivity of biological important molecules ex;- Carbohydrates and Amino acids.
3. Able to know synthesis of different Amino acids .
4. Able to understand resonance structures of Pyrrole, Furan and Thiophene .
5. Able to recognize the preparation of Pyridine reactivity towards nucleophilic substitution reaction .

Department of Chemistry

2021-2022(Even)

Learning objectives and Outcomes

B.Sc.-4th Semester

Subject : General Chemistry

Learning objectives

1. To understand the concepts of metal ligand bonding in transition complex compounds .
2. To understand the concept of theories of bonding in metals.
3. To understand the reactivity of Carbanions.
4. To describe the term gold number and emulsions.
5. To know the preparation and applications of Colloids.

Learning outcomes

1. Recognize the bonding in transition compounds by VBT and CFST theories .
2. Able to explain metallic properties of VBT and free electron theory .
3. The students able to write the reactions and mechanism of Michael addition and Knoevengeal condensation .
4. Students able to classify colloids.
5. Able to write the preparations and properties of colloids.

Singareni collieriesWomen's Degree college, Kothagudem.

Department of Chemistry

2021-22(Even)

Learning Objective & Outcomes
B.Sc. - 5th Semester

Subject : Spectroscopy and Chromatography

Topic : Chromatography

Learning Objective

1. To provide a basic knowledge and understanding of essential chemical and physical principles for analytical chemistry.
2. To introduce basic analytical techniques and practical aspects of classical chemical analysis .
3. To solve problems related to chemical analysis and interpret analytical results.
4. To know about various separation techniques of solvent extraction.

Learning Outcomes

After the completion of the course, Students will be able to

1. Explain the theoretical principles and important applications of classical analytical methods and various techniques with in gravimetric and coulometric methods .

2. Explain the theoretical principles of selected instrumental methods.
3. Explain the theoretical principles of various separation techniques in Chromatography, and typical applications of Chromatography techniques .
4. Assess and suggest a suitable analytical method for a specific purpose and evaluate sensitivity and Errors
5. Make scientific reports from chemical experiments and present the result.
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Department of Chemistry

2021-2022 (Odd)

Learning objectives and Outcomes

B.Sc.-5th Semester

Topic : Spectroscopy

Learning Objectives

1. In order to study the NMR spectroscopy to understand the important role of nuclear magnetic resonance spectroscopy in the study of the structures of organic compounds.
2. To develop an understanding of the significance of the number, positions, intensities andsplitting of signals in nuclear magnetic resonance spectra.
3. To be able to assign structures to simple molecules on the basis of nuclear magnetic resonance spectra.
4. To understand the transitions through electronic spectroscopy
5. To understand the term symbols of diatomic molecules
6. To understand the different type of vapour pressure curves
7. To understand the ideal and non ideal solutions and their behaviour
8. To understand the thermodynamics of one and two component system.

Learning Outcomes

1. Students should have the ability to explain common terms in NMR spectroscopy such as chemical shift ,coupling constant and anisotropy and describe how they are affected by molecular structure.
2. Students are skilled to perform the most commonly used NMR experiments and to interpret and document their results.
3. Recognize the basic rules of electronic spectroscopy.
4. Able to predict the term symbols of diatomic molecules.
5 Able to understand the behavior of ideal and non ideal solutions.
6. Able to recognize the thermodynamics of one and two component system.
7. Recognize the basic rules of various component system.

Department of Chemistry

2021-2022 (Odd)

Singareni collieriesWomen's Degree college, Kothagudem

Department of Chemistry

2021-2022 (Even)

Learning objectives and Outcomes

B.Sc.-6th Semester

Subject-Medicinal Chemistry

Learning objectives

1. To understand the basic biological and pharmacological interactions by using both natural products and total synthesis of bioactive molecules.
2. Use of corresponding knowledge for the development of biologically and clinically active drugs.
3. It will include advanced courses in natural products, organic synthesis, medicinal chemistry; fundamentals of cell biology, molecular biology, drug design, and analytical methods.
4. Define the term selectivity and explain its relevance to drug therapy.
5. Describe receptor plasticity and explain its clinical relevance.
6. To understand the activity of vitamins and micro nutrients.

Learning Outcomes

1. Understanding of the basic biological and pharmacological interactions by using both natural products and total synthesis of bioactive molecules.
2. Use of corresponding knowledge for the development of biologically and clinically active drugs.
3. It will include advanced courses in natural products, organic synthesis, medicinal chemistry; fundamentals of cell biology, molecular biology, drug design, and analytical methods.
4. Students able to understand the proteins which specifically recognize a particular hormone.
5. Student able to define the terminology, affinity, efficacy and antagonists.

GDC Memorial College, Bahal (Bhiwani)

Department of Chemistry

2017-18(Even)

Learning Objective & Outcomes

B.Sc. - 6th Semester

Subject : Physical chemistry **Subject Code : CH-305**

Learning Objective

1. To understand the transitions through electronic spectroscopy
2. To understand the term symbols of diatomic molecules
3. To understand the different type of vapour pressure curves
4. To understand the ideal and non ideal solutions and their behaviour
5. To understand the thermodynamics of one and two component system.

Learning Outcomes

After the completion of the course, Students will be able to

1. Recognize the basic rules of electronic spectroscopy.
2. Able to predict the term symbols of diatomic molecules
3. Able to understand the behavior of ideal and non ideal solutions
4. Able to recognize the thermodynamics of one and two component system
5. Recognize the basic rules of various component system

GDC Memorial College, Bahal (Bhiwani)

Department of Chemistry

2017-2018(Even)

Learning Objective & Outcome

B.Sc-6th Semester

Subject: Organic chemistry **Subject Code : CH-306**

Learning objective

1. The main aim of Heterocyclic compounds study is to develop novel, efficient, convenient, selective and environmentally benign synthetic methods in organic chemistry.
2. The objective of the present study of heterocyclic compounds is to develop green methodologies for the synthesis of nitrogen containing heterocyclic.
3. The students will be aware about most of drugs in the present market are the compounds containing various heterocyclic moieties.
4. To enable students to acquire a specialised knowledge and understanding of selected aspects by means of lecture series and a research project.
5. The course aims to provide an advanced understanding of the core principles and topics of biochemistry and their experimental basis.

Learning outcomes

1. The students should be able to demonstrate advanced knowledge and understanding in aspect of protein structure.
2. The students will be able to introduce about basic chemistry of the heterocyclic.
3. The students will get familiar with particular properties and reactions for the most important heterocyclic as well as different systems of nomenclature.
4. The students will develop fundamental theoretical understanding of heterocyclic chemistry.
5. The students will be able to fully comprehend the chemistry of many heterocyclic products, carbohydrate, amino acids, peptides, proteins and lipids in use such as drugs and food.