

B.Sc. Chemistry

Academic Year 2018-2019 - Odd Semester Programme Outcomes of B.Sc.

- Apply the broaden and in-depth knowledge of science and computing to analyse, think creatively and generate solutions to face the global challenges.
- Foster intellectual curiosity, critical thinking and logical reasoning.
- Adapt to different roles and responsibilities and develop leadership qualities in multicultural working environment by relating to diversity and ethical practices.
- Update the techniques and acquire skills to develop systems and methods to solve current problems.

Programme Specific Outcome

PSO No.	<i>Upon completion of B.Sc Chemistry, students will be able to:</i>
PSO 1.	Understand the fundamentals, theories and principles of Organic, Inorganic and Physical chemistry
PSO 2.	Interpret the mechanism of chemical reactions.
PSO 3.	Analyze and solve problems systematically.
PSO 4.	Relate the presence and impact of chemical compounds in life
PSO 5.	Prepare / isolate/ synthesize and characterize chemical compounds
PSO 6.	Analyze the properties of metals, non-metals, alloys and other chemical compounds / macro molecules
PSO 7.	Carryout procedures as per laboratory standards in the areas of inorganic, organic and physical chemistry
PSO 8.	Identify and estimate the chemical compounds using classical and modern methods.
PSO 9.	Understand the applications of chemistry in medicine, research, agriculture and industry.

Semester : I
Name of the Course : Inorganic Chemistry - I
Subject Code : CC1711

Number of Hours Per week	Number of Credits	Total Number of Hours	Marks
4	4	60	100

Course Outcome

CO	Expected Learning Outcomes <i>Upon completion of this course, the students will be able to:</i>	PSO addressed	CL
CO 1.	Understand and remember the fundamental principles of inorganic chemistry	PSO 1	U
CO 2.	Analyze the different atom models	PSO 1	A
CO 3.	Identify the position of elements and predict their properties	PSO 6	R

CO 4.	Understands the preparation, chemical bonding and geometries of molecules	PSO 5	C
CO 5.	Construct MO diagrams of simple molecules	PSO 1	C
CO 6.	Evaluate the properties of s-block elements	PSO 6	E

Teaching Plan

Total Contact hours: 60 (Including lectures, assignments and tests)

Unit	Module	Topics	Lecture hours	Learning Outcome	Pedagogy	Assessment/Evaluation
I Atomic Structure						
	1	Atom models, Dual nature of matter – deBroglie equation, Davisson Germer experiment.	3	Understand the atom models	Lecture, Showing models of atoms	Evaluation through short test Assignment on eigen value and function Assignment on shapes of orbitals and electronic configuration
	2	Heisenberg's uncertainty principle and its significance, Photoelectric effect-Compton effect	2	Know the Heisenberg's uncertainty principle	Lecture	
	3	Schrodinger wave equation and its applications.	2	Learn the significance of Schrodinger wave equation	Illustration Lecture	
	4	Eigen value and Eigen function – significance of Ψ and Ψ^2 . Quantum numbers and their significance – nodal planes.	3	Differentiate between eigen value and eigen function	Lecture, Seminar	
	5	Sign of wave functions – shapes of s, p, d and f orbital, Principles governing the occupancy of electrons around the nucleus, Pauli's exclusion principle, Hund's rule. Electronic configuration of elements with atomic number upto 30.	2	Know filling up of atomic orbitals	Lecture with ppt	
II Periodic Table						
	1	Modern periodic law – Long form of periodic table and features, Classification as s, p, d and f block elements on the basis of electronic configuration, Periodicity in properties.	4	Classify the elements and to learn their properties.	Question answer session	Multiple choice questions Short test Formative assessment - I
	2	Effective nuclear charge, shielding or screening effect, Slater rule, Variation of effective nuclear charge, atomic radii, ionic radii, covalent radii in periodic table.	3	Evaluate the variation in effective nuclear charge.	Lecture,	
	3	Electron affinity and Electronegativity – Variation along the group and period, Pauling's, Mulliken and Alfred Rochow's scale of electronegativity, applications of electronegativity.	4	Calculate the electronegativity	Lecture with ppt, Group discussion	
III Chemical Bonding						
	1	Ionic bond - properties of ionic compounds, Lattice energy, Born - Haber cycle.	2	Distinguish the nature of bond	Seminar	Short test
	2	Valence bond theory – postulates, Hybridization - sp, sp ² , sp ³ , sp ³ d, sp ³ d ²	4	Know the postulates of VBT	Assignment on	

		, sp^3d^3 .		&Hybridisation	hybridisation	Assignment on MO diagrams
	3	MO Theory – applications of MOT to $H_2, N_2, O_2, F_2, HF, CO$ and NO .	5	Skills to draw MO diagrams		
IV s-block elements						
	1	General characteristics of group 1 elements, comparison of lithium with other members of the family and its diagonal relationship with magnesium.	3	Compare the elements of periodic table	Illustration, Seminar	Multiple choice questions Formative assessment - II
	2	Extraction of lithium – uses of alkali metals, Lithium carbonate, sodamide, sodium cyanide, potassium cyanide - preparation and uses.	3	Learn the process of Extraction alkali metals	Lecture, Group discussion	
	3	General characteristics of group 2 elements comparison of beryllium with other elements and its Diagonal relationship with aluminium.	3	Understand the general characteristics of group 2 elements	Lecture with ppt	
	4	Extraction of beryllium and properties, Basic beryllium acetate, calcium carbide, calcium cyanamide – preparation and uses.	3	Learn the process of Extraction beryllium and its compounds	Lecture, Illustration	
V Hydrogen and Water						
	1	Position of hydrogen in the periodic table, Resemblance with alkali metals and halogens.	2	Compare Hydrogen with alkali metals	Lecture, Quiz	Quiz Short test Assignment on hydrides Formative assessment - III
	2	Types of hydrogen, Hydrogen as a future fuel, Isotopes of hydrogen and Heavy water.	3	Know the importance of hydrogen as future fuel	Lecture with ppt	
	3	Hydrides – classification, preparation, properties and uses. Occlusion.	3	Classify hydrides and to know its preparation,	Lecture, Group discussion	
	4	Determination of hardness of water by EDTA method, DO –definition and determination, BOD, COD – definition and significance.	4	Determine the hardness of water	Lecture, Demonstration samples of water	

Course Instructor: Sr. K. Francy

HOD: G. Leema Rose

Semester : I
 Name of the Course : Allied Chemistry -General Chemistry
 Subject Code : CA1711

Number of Hours Per week	Number of Credits	Total Number of Hours	Marks
4	4	60	100

Course Outcome

CO No.	Expected Learning Outcomes <i>Upon completion of this course, the students will be able to:</i>	PSO	CL
CO 1.	Know about the filling of electrons in atomic orbitals	PSO 1	R
CO 2.	Understand the principles behind atomic structure, dipole-moment applications & Born Haber cycle	PSO 1	U
CO 3.	Interpret the characteristics of ionic covalent, hydrocarbons compounds	PSO 2	U
CO 4.	VSEPR theory, deduce the shapes of molecules using VSEPR theory & hybridization	PSO 2	Ap
CO 5.	Validate the VB theory and benzenoid compounds	PSO 2	E
CO 6.	Differentiate the types of organic reactions, cleavage of bonds and reagents.	PSO 3	An
CO 7.	Discuss the preparation structure and stability of hydrocarbons, aliphatic hydrocarbons	PSO 5	C

Teaching Plan

Total Contact hours : 60 (Including lectures, assignments and tests)

Unit	Module	Topics	Lecture hours	Learning outcome	Pedagogy	Assessment/Evaluation
I	Atomic Structure					
	1.	Dual nature of electron – de-Broglie equation Davisson and Germer experiment - Heisenberg's uncertainty principle and its significance Schrodinger's wave equation and its significance.	3	Distinguish between particle and wave. Understand Davisson and Germer's Experiment Recall Schrodinger wave equation and its significance	Lecture discussion	Short test Multiple choice questions Assignment Formative assessment -I
	2.	Eigen value and eigen functions Quantum numbers and their significance. Atomic orbitals - significance - shapes.	3	Know the characteristic of Eigen values and Eigen functions. Realize the importance of quantum numbers Gain knowledge about the shapes of atomic orbitals	Lecture	
	3.	Difference between orbit and orbital Rules for filling up of orbitals – Pauli's exclusion principle – Aufbau principle – Hund's rule Electronic configuration of elements with atomic number up to 20.	5	To understand the rules followed in filling up of electrons. Write the electronic configuration of atoms	Question answer session	
II	Chemical Bonding					
	1.	Formation of ionic compound with examples	4	Understand the formation of ionic bond.	Lecture discussion	Assignment

		General characteristics of ionic compounds Lattice energy – Born Haber cycle and its applications.		Recall the general characteristic of ionic compounds. Calculate lattice energies of some ionic compounds		Formative assessment -I Short test
	2.	Factors affecting dissolution of ionic compounds. Fajan's rules – ionic character in covalent compounds.	3	Gain knowledge on the factors affecting dissolution of ionic compounds. Recognize ionic character in covalent bonds.	Lecture	
	3.	Percentage of ionic character, Bond moment Dipole moment – applications of dipole moment.	2	Calculate the amount of ionic character in covalent bonds. List the applications of dipole moment.	Lecture discussion	
	4.	Structure of CO ₂ , H ₂ O, SO ₂ , BF ₃ , NH ₃ , CH ₄ and cis-trans isomerism.	3	Predict the structures of compounds.	Lecture with PPT illustration	
III	Covalent Bonding					
	1.	VB approach – postulates Formation of single, double and triple bond with examples Characteristics of covalent compounds.	3	Understand the postulates of VB Theory Gain knowledge about the formation of bonds. Recall the characteristics of covalent bonds.	Lecture	Seminar Formative assessment -II Quiz
	2.	VSEPR theory – shapes of inorganic molecules Hybridisation with suitable examples of linear (BeCl ₂) Trigonal planar (BCl ₃) and tetrahedral molecules (CH ₄).	4	Predict the shapes of inorganic molecules. Find out the types of hybridisation.	Lecture with PPT illustration	
	3.	Hydrogen bonding – types with examples Effects of hydrogen bonding.	2	Gain knowledge about hydrogen bonding. Understand the effects of hydrogen bonding	Lecture discussion	
IV	Fundamentals of Organic Chemistry					
	1.	Cleavage of bonds – homolysis and heterolysis Nucleophiles and electrophiles with examples Reaction intermediates.	3	Gain knowledge about cleavage of bonds. Find out nucleophiles and electrophiles Gain knowledge about reaction intermediate	Lecture discussion	Seminar
	2.	Carbocations, carbanions and free radicals (preparation, structure and stability) Types of reactions – substitution, addition, elimination and	5	Know about reaction intermediate. To explain the types of reactions List the characteristics of covalent bonds	Lecture with PPT illustration	

		polymerization Aromaticity: General characteristics of aromatic compounds.				Quiz
	3.	Huckel's rule – benzenoid compounds.	2	Predict aromaticity using Huckel's rule.	Group discussion	Multiple choice questions
V	Aliphatic Hydrocarbons					
	1.	Alkanes (upto five carbons) – preparation - catalytic hydrogenation Wurtz reaction, Kolbe's synthesis Reactions - free radical substitution – halogenations.	4	Gain knowledge about the preparation and properties of alkanes. Recall Wurtz reaction and Kolbe's synthesis Know about free radical substitution reactions	Lecture discussion	Assignment
	2.	Alkenes (upto five carbons) – preparation - dehydration of alcohols and dehydrogenation of alkyl halides Saytzeff's rule Reactions - hydration, ozonolysis, and oxidation Markownikoff's and anti Markownikoff's addition.	5	Gain knowledge about alkenes. Apply Saytzeff 's rule. Recall the reactions of alkenes. State and apply Markonikoff rule.	Lecture with PPT illustration	Formative assessment -III
	3.	Alkynes: Preparation – acetylene from calcium carbide Dehalogenation of tetrahalides Formation of metal acetylides, addition of Br ₂ and alkaline KMnO ₄ .	3	Gain knowledge about the preparation of alkynes. Gain Knowledge about dehalogenation reaction. Recall the preparation and properties of alkynes.	Lecture	

Course Instructor: S. AjithSinthuja

HOD: G. Leema Rose

Semester : I
Molecules of Life
Subject Code : CNM171

Number of Hours Per week	Number of Credits	Total Number of Hours	Marks
4	3	60	100

Course Outcome

CO No.	Expected Learning Outcomes <i>Upon completion of this course, the students will be able to:</i>	PSO	CL
CO 1.	Understand the functions of nutrients like carbohydrates, vitamins and minerals in the body	PSO 1	U
CO 2.	Remember the principles of metabolism	PSO 1	R
CO 3.	Differentiate and know the functions of DNA and RNA	PSO 3	R
CO 4.	Classify and estimate aminoacids, carbohydrates and	PSO 1, PSO 9	E

	proteins		
CO 5.	Correlate the pathways of enzymes and lipids	PSO 1	U
CO 6.	Aware of the diseases caused by lack of vitamins	PSO 1	U
CO 7.	List out the industrial and medical applications of enzymes	PSO 1	R
CO 8.	Generalize toxicity of various minerals in the body	PSO 1	U

Teaching Plan

Total Contact hours : 60 (Including lectures, assignments and tests)

Unit	Module	Topics	Lecture hours	Learning Outcome	Pedagogy	Assessment/ Evaluation
I	Carbohydrates					
	1	Introduction – classification with examples. Manufacture of cane sugar – functions of carbohydrates in the body.	3	Understand the process of manufacture of sugar	Lecture	Evaluation through multiple choice questions Assignment on the different sources of carbohydrates Short test
	2	Energy source, maintenance of heart action and central nervous system. Digestion – absorption – metabolism of carbohydrates – bio-synthesis of sugar.	3	Know the biological activities of human body	Lecture Group discussion	
	3	Digestion – absorption – metabolism of carbohydrates – bio-synthesis of sugar. Tests for carbohydrates – Molisch's, Benedict, Seliwanoff's, Iodine test.	3	Learn the importance of carbohydrates in our metabolism	Lecture with Demonstration	
	4	Tests for carbohydrates - Bial's, Fehlings and Barfoed's test. Regulation of blood sugar – diabetes mellitus, Sources of carbohydrates in the diet. Functions of carbohydrates in our body.	3	Test the given samples for the presence of carbohydrates	Lecture with Demonstration	
II	Amino acids , Proteins and Nucleic acids					
	1	Amino acids - Definition, classification of amino acids. Classification on the basis of their chemical structure and nutritional requirement.	4	Acquire skills to identify amino acids on the basis of their chemical structure and nutritional requirement	Lecture and Seminar	Assignment on food items of amino acids Multiple choice questions Formative assessment - I
	2	Isolation of amino acid from proteins. Peptide linkage – polypeptides. Proteins, Definition, Classification based on biological functions.	4	Understand the biological functions of proteins.	Lecture with ppt	
	3	Tests for proteins, Functions of DNA & RNA Difference between DNA and RNA.	3	Differentiate between the functions of DNA	Showing models of DNA, RNA	

				and RNA		
III	Lipids					
	1	Lipids, Definition and classification Metabolic and structural functions of lipids, Digestion of lipids and absorption of lipids.	3	be able to understand the functions of lipids	Seminar	Short test Quiz Multiple choice questions
	2	Quantitative analysis of lipids, Qualitative tests for lipids.	3	analyse lipids quantitatively and Qualitatively	Demonstration	
	3	Biological importance of cholesterol, biological activities of lipids.	2	evaluate the biological importance of cholesterol	Group discussion	
	4	Biological importance of bile acids.	2	know the biological importance of bile acids	Lecture	
	5	Tests for cholesterol and normal level of cholesterol.	2	tests samples for cholesterol	Demonstration	
IV	Enzymes					
	1	Enzymes, Introduction, general properties, Classification of Enzymes.	3	classify enzymes	seminar	Multiple choice questions Formative assessment – II
	2	Factors influencing enzyme action, Regulatory enzymes, Allosteric enzymes, Covalently modulated enzymes.	4	identify the differences between enzymes	Lecture with PPT	
	3	Isoenzymes, definition and examples, Industrial applications of enzymes, Medical applications of enzymes.	4	recall the applications of enzymes	Illustration Question answer session	
V	Minerals, Vitamins and water					
	1	Minerals- Introduction , source and function, Deficiency and toxicity of calcium, Phosphorous, Sodium Potassium, Iron and Iodine.	3	know the deficiency and toxicity of metals.	Lecture Group discussion	Multiple choice questions Assignment on toxicity in our food system and vitamins Formative assessment - III
	2	Source and distribution of water in the body, Functions of water, Absorption and metabolism of water, Storage of water.	3	realize the importance of water	Lecture Seminar	
	3	Vitamins, Classification of vitamins, sources of vitamins, Biological function of vitamins.	2	distinguish the sources of vitamins	Lecture	
	4	Deficiency diseases of Vitamin A, B, C, D,E and K.	3	aware of the vitamin deficiency	Lecture Question answer	

Course Instructor: M. AnithaMalbi

HOD: G. Leema Rose

Semester : III
 Name of the course : Organic Chemistry – I
 Subject Code : CC1731

Number of Hours Per week	Number of Credit	Total Number of Hours	Marks
4	4	60	100

Course Outcome

CO No.	Expected Learning Outcomes <i>Upon completion of this course, the students will be able to:</i>	PSO	CL
CO 1.	Name and to understand the nomenclature of organic molecules based on IUPAC system & apply the rules to name the organic compounds	PSO 1, PSO 3	U
CO 2.	Relate the shapes of molecules with hybridization	PSO 2 PSO 4	Ap
CO 3.	Understand and apply the different polar effects occurring in organic molecules	PSO 1, PSO 3	A
CO 4.	Prepare hydrocarbons, alkyl halides, ethers, alcohols reactions, distinction among alcohols & estimation of alcohols	PSO 5	C
CO 5.	Differentiate Markowni and Anti Markownikoff addition	PSO 3	An, C
CO 6.	Infer different types of reactions and reaction mechanisms	PSO 2	E

Teaching Plan

Total Contact hours : 60 (Including lectures, assignments and tests)

Unit	Module	Topics	Lecture hours	Learning Outcome	Pedagogy	Assessment/ Evaluation
I	Basics Concepts of Organic Chemistry					
	1	Classification of organic compounds and IUPAC system of nomenclature, Longest chain rule, lowest number rule.	2	Know to write IUPAC name	Lecture, Group discussion	Multiple choice questions Assignment on IUPAC names
	2	IUPAC naming of hydro carbons, alcohols, aldehydes, ketones, amines, and compounds with additional functional groups.	3	Ability to solve problems	Lecture, Seminar	
	3	Hybridisation – types – sp^3 Sp^2 SPhybridisation with CH_4 C_2H_4 , C_2H_2 as examples.	4	Differentiate various hybridisations	Lecture with ppt	
	4	Influence of hybridization on bond properties Homolytic and heterolytic fission – examples.	2	Learn types of fission	seminar	
	5	Electrophiles and nucleophiles - examples. Preparation, structure and stability of Carbanions, carbocations and free radicals.	2	Distinguish between electrophiles and nucleophiles	Lecture Question answer session	
II	Electronic Displacements					

	1	Inductive effect in organic molecules, +I and – I groups, comparison of strength of substituted acids and bases.	3	Understand the Inductive effect		
	2	Electromeric effect – definition – types – examples and its applications, Resonance effect – definition – relative strength of acids, resonance effect and conjugated system, Hyper conjugation effect – definition – stability of carbocations and free radicals.	5	Analyse the stability of intermediates.	Lecture with ppt, Group discussion	Quiz Short test Formative assessment - I
III	Chemistry of Aliphatic hydrocarbons					
		Chemistry of alkanes, general methods of preparation, Wurtz reaction, free radical substitutions - halogenation.	2	Learn the synthesis of alkanes	Short test	
		Formation of alkenes and alkynes by elimination reactions - Saytzeff and Hofmann eliminations.	2	Know the difference between elimination.	seminar	
		Electrophilic addition of hydrogen halide - mechanisms of Markownikoff and Anti-Markownikoff addition.	2	Know addition reactions	Lecture	Evaluation through multiple choice questions
		Hydroboration, oxidation, ozonolysis, reduction (catalytic and chemical), cis and trans-hydroxylation, 1, 2- and 1, 4 - addition reactions in conjugated dienes, Diels-Alder reaction.	3	Evaluate the 1, 2- and 1, 4 - addition	Group discussion and writing mechanism	Quiz
		Acidity, electrophilic and nucleophilic additions of alkynes, Birch reduction- mechanism.	2	Analyse the additions of alkynes	Lecture	
IV	Chemistry of halogenated hydrocarbons					
	1	General methods of preparation of alkyl halides, Nucleophilic substitution reactions – S _N 1 mechanism, S _N 2 mechanism with stereochemical aspects and effect of solvent, S _N i mechanisms with stereochemical aspects and effect of solvent, Differences between S _N 1, S _N 2.	5	Be able to evaluate the substitution reactions	Lecture	Evaluation through short test Assignment on nucleophilic substitution reactions
	2	E2 mechanism. elimination – E1 mechanism.	2	Differentiate E1 from E2 mechanism	Lecture	Quiz Multiple

	3	Preparation, properties of vinyl chloride, allyl chloride, tetrafluoro ethylene, Freon, westron, chloroform, idoform carbon tetrachloride. andwestrosol.	4	Learn the preparation of alkyl halides	Lecture Question answer session	choice questions Formative assessment II
V	Functional groups containing oxygen					
	1	General methods of preparation and properties of alcohols.	2	Learn the synthesis of alcohols	seminar	Short test Formative assessmentIII
	2	Distinction among 1°, 2°, 3° alcohols - oxidation method, Victor Meyer method and Lucas method.	2	Analyze the alcohol samples	Lecture Demonstration	
	3	Preparation and properties of glycols, Oxidation of glycols by periodic acid and lead tetra acetate. Mechanism of Pinacol-Pinacolone rearrangement.	3	Learn the preparation of Dihydric alcohols	Lecture with ppt	
	4	Glycerol -manufacture (hydrolysis of fats and oils), synthesis of glycerol from propene, reactions, preparation of nitroglycerine. Estimation of number of hydroxyl groups.	3	Synthesise glycerol	Lecture Demonstration	
	5	Preparation and reactions of ethers ethers with acids, epoxides - reactions of epoxides with alcohols.	2	Know the preparation of ethers	Illustration seminar	

Course Instructor: R. GladisLatha

HOD: G. Leema Rose

Semester : III
 Name of the Course : Dairy Chemistry
 Subject Code : CC1732

Number of Hours Per week	Number of Credit	Total Number of Hours	Marks
4	4	60	100

Course Outcome

CO No.	Expected Learning Outcomes <i>Upon completion of this course, the students will be able to:</i>	PSO	CL
CO 1.	Recall the physical properties of milk	PSO 1	R
CO 2.	Cite examples of various factors affecting the quality of milk	PSO 6	U
CO 3.	Assess the microbiology of milk	PSO 6	E
CO 4.	Collect various methods to pasteurize milk	PSO 1	C
CO 5.	Apply the methods of manufacture of	PSO 7	Ap

	special milks and dairy cleaning		
CO 6.	Correlate the acidity, moisture content and fat content of milk products	PSO 6	An
CO 7.	Estimate the amount of lactose in milk	PSO 7	E
CO 8.	Choose milk proteins, milk carbohydrates and milk vitamins and dairy products	PSO 5	E
CO 9.	Utilize methods of separation of cream, utter, ghee, cheese &kheer	PSO 7	Ap
CO 10.	Explain preparation of Dairy sweets	PSO 5	Ap

Teaching Plan

Total Contact hours : 60 (Including lectures, assignments and tests)

Unit	Module	Topics	Lecture hours	Learning outcome	Pedagogy	Assessment/ Evaluation
I	Properties of milk					
	1.	Definition , composition and physico chemical properties of milk - colour, odour, acidity, specific gravity, conductivity of milk Factors affecting composition of milk Food and nutritive value of milk.	4	Gain knowledge about milk. Recall the factors affecting composition of milk. To know the nutritive value of food.	Lecture	Assignment
	2.	Flavour defects in milk their causes and prevention Uses of milk and Estimation of fat Estimation of acidity and total solids in milk Adulterants in milk – definition, common adulterants and their detection.	4	Know the methods of estimating the acidity and total solids in milk Detect the adulterants present in milk.	Lecture with PPT illustration	Multiple choice questions
	3.	Estimation of acidity and total solids in milk Adulterants in milk – definition common adulterants and their detection	3	To know the preservatives added to milk.		
	4.	Preservatives in milk – definition, common preservatives and detection Neutralizers in milk – definition, common neutralizers and detection.	3	Know the importance of neutralizers in milk	Group discussion	Quiz
II	Microbiology of milk					
	1.	Pasteurization – definition, objectives and requirements Various methods of pasteurization – in the bottle	4	Realize the importance of pasteurization Know the methods	Lecture	Short test Seminar Quiz

		pasteurization and batch (LTLT) pasteurization HTST pasteurization and UHT pasteurization Uperization, vacuum pasteurization and stassanization.		of pasteurization Know the methods of pasteurization.		Formative assessment -I
	2.	Dairy detergents, cleaning and sanitizing procedure CIP (Cleaning in place).	2	Gain knowledge about dairy detergents. Recognize the importance of cleaning in place.	Mind mapping	
	3.	Sterilizers – definition , properties Cleaning and sterilization of dairy utensils, Chloramine – T and hypochlorite solution	5	Define sterilizers and know their properties. Discuss the methods of cleaning and sterilizing the utensils	Question answer session	
III	Special Milks					
	1.	Sterilized milk – definition, equirements, advantages and disadvantages and method of manufacture.	2	To discuss the advantages and disadvantages of manufacture of milk	Lecture with PPT illustration	Formative assessment -II
	2.	Homogenized milk – definition, merits and demerits, method of manufacture Flavouredmilks - Chocolate and Fruit flavoured milk.	3	Gain knowledge about the merits and demerits of homogenized milk. Know about flavoured milk	Mind mapping	
	3.	Vitaminized milk and Standardized milk Single and double toned milk, Humanised milk.	2	Explain the importance of vitaminized and standardized milk. To explain about single and double toned milk.	Question answer session	
	4.	Dried milk - Definition, composition, objectives of production andmanufacture Role of milk constituents, keeping quality in dried milk.	3	To know about dried milk. Realize the need for quality in drying milk	Panel session on adulterants in milk	
	5.	Condensed Milk - Definition, composition, objectives and manufacture Uses of condensed and evaporated milk Types of condensed milk – plane, super-heated& frozen condensed milk.	3	Recognize the objectives and composition of condensed milk. List the uses of condensed milk To explain the types of condensed milk.	Lecture	
IV	Cream, Butter, Ghee, Ice cream and Cheese					
	1.	Creams: Definition, composition, estimation of fat	4	Define creams. Gain knowledge	Question answer	short test

		in cream Butter: Definition, composition, manufacture and estimation of fat in butter Determination of acidity and moisture content of butter.		about butter Know the methods of determination of acidity and moisture content.	session	
	2.	Ghee – constituents, adulterants and their detection Rancidity of ghee and their types Ice cream – definition, classification , composition, food and nutritive value Defects in ice cream, their causes and prevention.	4	Gain knowledge about ghee. List the types of rancidity Gain knowledge about ice creams Recall the methods of prevention of defects in ice cream	Lecture	Quiz
	3.	Cheese: Introduction – definition – classification – composition – food and nutritive value Cottage cheese, processed cheese – defects in cheese their causes and prevention.	3	Gain knowledge about cheese. List the various types of cheese.	Lecture	Assignment
V	Proteins, Carbohydrates, Vitamins in milk and dairy sweets					
	1.	Physical and electrical properties of Milk Proteins Effects of heat on Milk Proteins, Milk Enzymes and functions Milk carbohydrate:Lactose – structure.	4	List the physical and chemical properties of milk. Understand the effect of heat on milk proteins. Elucidate the structure of lactose.	Mind mapping	Quiz Formative assessment -III
	2.	Reactions of lactose Estimation of lactose in milk – Picric acids method and chloroamine – T method Milk vitamins – water soluble and insoluble.	3	Recall the reactions of lactose. Gain knowledge about the estimation of lactose. List the various vitamins present in milk.	Lecture	Multiple choice questions

	3.	Dairy Sweets – preparation Kheer – Khoa/ Mawa – Khurchan – Rabri- Kulfi/Malai –Ka- baraf- Dahi – Paneer Chhana – Makkhan – Lassi - Ghee Residue, butter milk.	3	Gain knowledge about the methods of preparing dairy sweets. Know the different kinds of dairy product.	Lecture with PPT illustration	Multiple choice questions Assignment Multiple choice questions
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Course Instructor: L. Deva Vijila

HOD: G. Leema Rose

Semester : III
Name of the Course : Allied Chemistry - General Chemistry
Course Code : CA1731

Number of Hours Per week	Number of Credits	Total Number of Hours	Marks
4	4	60	100

Course Outcome

CO No.	Expected Learning Outcomes <i>Upon completion of this course, the students will be able to:</i>	PSO	CL
CO 1.	Know about the filling of electrons in atomic orbitals	PSO 1	R
CO 2.	Understand the principles behind atomic structure, dipole- moment applications & Born Haber cycle	PSO 1	U
CO 3.	Interpret the characteristics of ionic covalent, hydrocarbons compounds	PSO 2	U
CO 4.	VSEPR theory, deduce the shapes of molecules using VSEPR theory & hybridization	PSO 2	Ap
CO 5.	Validate the VB theory and benzenoid compounds	PSO 2	E
CO 6.	Differentiate the types of organic reactions, cleavage of bonds and reagents.	PSO 3	An
CO 7.	Discuss the preparation structure and stability of hydrocarbons, aliphatic hydrocarbons	PSO 5	C

Teaching Plan

Total Contact hours : 60 (Including lectures, assignments and tests)

Unit	Module	Topics	Lecture hours	Learning outcome	Pedagogy	Assessment/ Evaluation
I	Atomic Structure					
	1.	Dual nature of electron – de-Broglie equation Davisson and Germer experiment - Heisenberg's uncertainty principle and its significance Schrodinger's wave equation and its significance	3	Distinguish between particle and wave. Understand Davisson and Germer's Experiment Recall Schrodinger wave equation and its significance	Lecture discussion	Short test
	2.	Eigen value and eigen functions Quantum numbers and their significance. Atomic orbitals - significance - shapes.	3	Know the characteristic of Eigen values and Eigen functions. Realize the importance of quantum numbers Gain knowledge about the shapes of atomic orbitals	Lecture	Multiple choice questions Assignment Formative assessment -I
	3.	Difference between orbit and orbital Rules for filling up of orbitals – Pauli's exclusion principle – Aufbau principle – Hund's rule Electronic configuration of elements with atomic number up to 20.	5	To understand the rules followed in filling up of electrons. Write the electronic configuration of atoms	Question answer session	
II	Chemical Bonding					
	1.	Formation of ionic compound with examples General characteristics of ionic compounds Lattice energy – Born Haber cycle and its applications	4	Understand the formation of ionic bond. Recall the general characteristic of ionic compounds. Calculate lattice energies of some ionic compounds	Lecture discussion	Assignment

	2.	Factors affecting dissolution of ionic compounds. Fajan's rules – ionic character in covalent compounds	3	Gain knowledge on the factors affecting dissolution of ionic compounds. Recognize ionic character in covalent bonds.	Lecture	Formative assessment -I
	3.	Percentage of ionic character, Bond moment Dipole moment – applications of dipole moment	2	Calculate the amount of ionic character in covalent bonds. List the applications of dipole moment.	Lecture discussion	
	4.	Structure of CO ₂ , H ₂ O, SO ₂ , BF ₃ , NH ₃ , CH ₄ and cis-trans isomerism.	3	Predict the structures of compounds.	Lecture with PPT illustration	Short test
III	Covalent Bonding					
	1.	VB approach – postulates Formation of single, double and triple bond with examples Characteristics of covalent compounds	3	Understand the postulates of VB Theory Gain knowledge about the formation of bonds. Recall the characteristics of covalent bonds.	Lecture	Seminar
	2.	VSEPR theory – shapes of inorganic molecules Hybridisation with suitable examples of linear (BeCl ₂) Trigonal planar (BCl ₃) and tetrahedral molecules (CH ₄)	4	Predict the shapes of inorganic molecules. Find out the types of hybridisation.	Lecture with PPT illustration	Formative assessment -II
	3.	Hydrogen bonding – types with examples Effects of hydrogen bonding	2	Gain knowledge about hydrogen bonding. Understand the effects of hydrogen bonding	Lecture discussion	Quiz
IV	Fundamentals of Organic Chemistry					
	1.	Cleavage of bonds – homolysis and heterolysis Nucleophiles and electrophiles with examples Reaction intermediates	3	Gain knowledge about cleavage of bonds. Find out nucleophiles and electrophiles Gain knowledge about reaction intermediate	Lecture discussion	Seminar
	2.	Carbocations, carbanions	5	Know about reaction	Lecture	

		and free radicals (preparation, structure and stability) Types of reactions – substitution, addition, elimination and polymerization Aromaticity: General characteristics of aromatic compounds		intermediate. To explain the types of reactions List the characteristics of covalent bonds	wirh PPT illustration	Quiz Multiple choice questions
	3.	Huckel's rule – benzenoid compounds.	2	Predict aromaticity using Huckel's rule.	Group discussion	
V Aliphatic Hydrocarbons						
	1.	Alkanes (upto five carbons) – preparation - catalytic hydrogenation Wurtz reaction, Kolbe's synthesis Reactions - free radical substitution – halogenations	4	Gain knowledge about the preparation and properties of alkanes. Recall Wurtz reaction and Kolbe's synthesis Know about free radical substitution reactions	Lecture discussion	Assignment
	2.	Alkenes (upto five carbons) – preparation - dehydration of alcohols and dehydrogenation of alkyl halides Saytzeff's rule Reactions - hydration, ozonolysis, and oxidation MarkowniKoff's and anti MarkowniKoff's addition	5	Gain knowledge about alkenes. Apply Saytzeff 's rule. Recall the reactions of alkenes. State and apply Markonikoff rule.	Lecture wirh PPT illustration	Formative assessment -III
	3.	Alkynes: Preparation – acetylene from calcium carbide Dehalogenation of tetrahalides Formation of metal acetylides, addition of Br ₂ and alkaline KMnO ₄	3	Gain knowledge about the preparation of alkynes. Gain Knowledge about dehalogenation reaction. Recall the preparation and properties of alkynes.	Lecture	

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