



AUXILIUM COLLEGE (Autonomous)

(Accredited by NAAC with A+ Grade with a CGPA of 3.55 out of 4 in the 3rd cycle)
Gandhi Nagar, Vellore – 6.

DEPARTMENT OF CHEMISTRY

LESSON PLAN

2021-2022

LESSON PLAN

Academic Year : 2021-22
 Class : III B.Sc. Chemistry
 Subject : Physical Chemistry
 Hours / Week : 5
 Credits : 4

Semester : V
 Class Code :
 Subject Code : UCCHI19
 Total Hours : 75
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
1	5	1 1.1	Chemical Kinetics- Scope, factors that affect, Order and Molecularity - Methods. Derivation of k of 1 st and 2 nd order reactions	Google Meet; Chalk & Talk	Physical Chemistry- Puri & Sharma	
2	5	1 1.2	3 rd and 0 order reactions Examples. Methods to determine the order	”	Kinetics & Photo Chemistry- Jainudeen	
3	5	1 1.3 1.4	Experimental methods in the study of kinetics. Arrhenius Equation	”	Chemical Kinetics- Laidler	
4	5	2 2.1	Collision Theory Lindemann's Theory	”		
5	5	2 2.2	ARRT - Derivation of Rate constant	”	”	
6	5	2 2.3 2.4	Comparison of CT & ARRT Significance of ΔH^* , ΔG^* & ΔS^* . Complex Reactions.	”		

7	5	3 3.1 3.2	Photo Chemistry - Laws Jablonski diagram - 1° and 2° reactions. Quantum Yield	”	”	
8	5	3 3.3	Kinetics of $H_2 - Br_2$ reaction. Photolysis of aldehydes - Rice Herzfeld mechanism	”	”	
9	5	3 3.4	Photosensitization, Chemiluminescence Biochemiluminescence	”	”	
10	5	4 4.1 4.2	Phase Rule - Derivation. Water System and Sulphur System	”	Phase Rule - Gurtu	
11	5	4 4.3	Pb - Ag system Thermal analysis & Cooling curves. Zn - Mg, $FeCl_2 - H_2O$ systems	”	Physical Chemistry - Purif Sharma	
12	5	4 4.4	Na - K System CST - Effect of Impurity	”	”	
13	5	5 5.1 5.2	Catalysis - Function of a catalyst in terms of free energy of activation	”	”	
14	5	5 5.2 5.3	Kinetics of Unimolecular Surface reactions. Enzyme Catalysis	”	”	
15	5	5 5.4	Adsorption - Freundlich, Langmuir & BET isotherms	”	”	


LESSON PLAN

Academic Year : 2021-22
 Class : M.Sc. Chemistry
 Subject : Kinetics and Photochemistry
 Hours / Week : 1
 Credits : 4

Semester : I
 Class Code :
 Subject Code : PCCHC20
 Total Hours : 15
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
1	1	1	Activated Complex Theory - Introduction	Google meet	Chemical Kinetics -	
2	1	1	Derivation in terms of thermodynamics	"	Laidler Frost &	
3	1	1	Eyring equation in terms of Vibrational partition function	"	Pearson Kinetics and Mechanisms of Chemical	
4	1	1	Eyring equation in terms of translational partition function	"	J. Rayaram ^{Transformations} Kurikose	
5	1	1	Determination of ΔG^* , ΔH^* and ΔS^* and significance.	"	"	
6	1	1	Potential Energy Surfaces	"	"	

7	1	1	Reactions in Solution Effect of Pressure	Chalkd Talk method	"	
8	1	1	Effect of Dielectric Constant - Single Sphere model	"	"	
9	1	1	Effect of Dielectric Constant - Double Sphere model	"	"	
10	1	1	Effect of Ionic strength	"	"	
11	1	1	Cage effect	"	"	
12	1	1	Kinetic Isotope effect - Introduction	"	"	
13	1	1	LFER	"	"	
14	1	1	Hammett equation	"	"	
15	1	1	Taft equation	"	"	


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LESSON PLAN

Academic Year : 2021-22
Class : III B.Sc. Chemistry
Subject : Physical Chemistry Practicals
Hours / Week : 5/week + 1 hr (Viva)
Credits : 4

Semester : I and VI
Class Code :
Subject Code :
Total Hours : 6
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
1			Expt No 1			
2			Expt No 2			
3			Expt No 3			
4			Expt No 4			
5			Expt No 5			
6			Expt No 6			

7		<u>I</u> CA Practical Examinations			
8		Expt No 7			
9		Expt No 8			
10		Expt No 9			
11		Expt No 10			
12		Expt No 11			
13		<u>II</u> CA Practical Examinations			

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LESSON PLAN

Academic Year : 2021-2022
Class : III B.Sc. Chemistry
Subject : Electro Chemistry
Hours / Week : 5 Hours
Credits : 4

Semester : VI
Class Code :
Subject Code : UCCHK19
Total Hours : 75
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	5	I	Electrical Conductance - Types-Metallic and Electrolytic, Gaseous and Mixed conductors. Definitions - R, C, S, K, Λ and μ .	Chalk and Talk Method	Electro Chemistry by	
II	5	I	Faraday's Laws of electrolysis. Measurement of Conductance. Wheatstone Bridge principle. Determination of K and Λ .	,,	Gurta Subhash	
III	5	I	Kohlrausch's Law and its applications. Transport number - Methods of Determination using Pt and Ag electrodes	,,	Satish Text Book	
IV	5	I	Ionic Mobility - Definition and determination. Determination of t by Moving Boundary Method.	,,	of Physical Chemistry	
V	5	II	Theory of Strong Electrolytes Debye Huckel Theory. Limiting law verification. Modification made by Onsager	,,	by Puri &	
VI	5	II	Activity, activity coefficient, mean ionic activity and mean ionic activity coefficient.	,,	Sharma	

<u>VII</u>	5	<u>II</u>	Applications of Conductance Measurement - Determination of μ Conductometric Titrations principle, technique and types)	Physical	
<u>VIII</u>	5	<u>II</u>	Solubility and K_{sp} . Determination by Conductivity method. Problems.)	Chemistry by	
<u>IX</u>	5	<u>III</u>	EMF - Galvanic cells, Reversible and irreversible electrodes. Determination of ΔG , ΔH and ΔS . Types of electrodes)	Maron and	
<u>X</u>	5	<u>III</u>	Electrochemical series and its applications. Types of Cells - Chemical & Concentration Cells.)	Prutton	
<u>XI</u>	5	<u>IV</u>	Electrode and Electrolytic conc. cells w.t and w.o.t. Applications of concentration cells - Valency of ions, K_w , K_{sp})	Electro Chemistry	
<u>XII</u>	5	<u>V</u>	Polarization - Over Voltage)	by Yadav	
<u>XIII</u>	5	<u>V</u>	Hydrogen Over Voltage Oxygen Over Voltage))	
<u>XIV</u>	5	<u>V</u>	Fuel Cells - $H_2 - O_2$ fuel cells.))	
			Problems & Revision			

LESSON PLAN

Academic Year : 2021-22
Class : II M.Sc. Chemistry
Subject : Thermodynamics
Hours / Week : 1 hour
Credits : 4

Semester : IV
Class Code :
Subject Code :
Total Hours : 15
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	1	II	Statistical Thermodynamics - Introduction	Chalk and Talk Method	Statistical Thermodynamics	
II	1	II	Importance of Statistical Thermodynamics.	"	by M.C. Gupta	
III	1	II	Thermodynamics and Mathematical Probability	"	Thermodynamics	
IV	1	II	Laws of Probability used in Physical Chemistry. Problems in Probability	"	by Rajaram	
V	1	II	Stirling approximation	"	Kuriakose.	
VI	1	II	Lagrange's method of undetermined multipliers.	"	"	

<u>VII</u>	I	II	Distribution and Most Probable distribution	"	"	
<u>VIII</u>	I	II	Maxwell-Boltzmann Distribution law	"	"	
<u>IX</u>	I	II	Bose-Einstein Distribution law	"	"	
<u>X</u>	I	II	Fermi-Dirac Distribution law	"	"	
<u>XI</u>	I	II	Applications and Problems	"	"	
<u>XII</u>	I	II	Derivation of $\beta = 1/kT$ Expression of thermodynamic quantities in terms of partition function.	"	"	
<u>XIII</u>	I	II	Ensembles - Types	"	"	
<u>XIV</u>	I	II	Problems and Revision.	"	"	

Auxilium College (Autonomous), Vellore - 6
Odd Semester Lesson Plan (2021-2022)
Dr. J. Rosaline Ezhilarasi
UCCHG19 - Inorganic Chemistry

Week	Portions to be Covered	References	Platform (LMS)
I	Unit 1.1 - General characteristics of d block elements and comparative study of Ti, V and Cr group elements.	Inorganic Chemistry by P. L. Soni and Puri & Sharma.	Google Classroom – Google Meet
II	Unit 1.1 & 1.2 - Comparative study of Mn and Fe group elements, Chemistry of lanthanides and actinides.	Inorganic Chemistry by P. L. Soni and Puri & Sharma.	Google Classroom – Google Meet
III	Unit 2.1 - Metallurgy and metallurgical processes - general methods of extraction, various concentration, refining and reduction methods.	Modern Inorganic Chemistry by R. D. Madan.	Google Classroom – Google Meet
IV	Unit 2.2 & 2.3 - Extraction, properties and uses of Ti, Zr, Pt and Th.	Modern Inorganic Chemistry by R. D. Madan and Advanced Inorganic Chemistry by Cotton and Wilkinson.	Google Classroom – Google Meet
V	Unit 2.3 & 2.4 - Extraction, properties and uses of U. Preparation and uses of ammonium molybdate, vanadium pentoxide, uranium hexa fluoride. Steel alloys - heat treatment of steel-uses of steel alloys.	Modern Inorganic Chemistry by R. D. Madan.	Google Classroom – Google Meet
VI	Unit 3.1 - Fundamental particles of the nucleus - nucleon terminology, nuclides, isotopes, isobars, isotones, mirror nuclei and isomers.	Essentials of Nuclear Chemistry by H J Arnikaar.	Google Classroom – Google Meet
VII	Unit 3.1 & 3.2 - Nuclear forces operating between the nucleons - meson exchange theory and nuclear fluid theory, N/P ratio, curves, stability belts.	Essentials of Nuclear Chemistry by H J Arnikaar and Elements of Nuclear Chemistry by A. K. Srivastava & P. C. Jain.	Google Classroom – Google Meet

VIII	Unit 3.2 - Nuclear binding energy: Mass defect - simple calculations involving mass defect and B.E per nucleon - magic numbers - liquid drop model - shell model.	Modern Inorganic Chemistry by R. D. Madan, Essentials of Nuclear Chemistry by H J Arnikaar and Elements of Nuclear Chemistry by A. K. Srivastava & P. C. Jain.	Google Classroom – Google Meet
IX	Unit 3.3 - Natural radioactivity - properties of radioactive rays - radioactive series including neptunium series - group displacement law - rate of disintegration and half-life period.	Modern Inorganic Chemistry by R. D. Madan.	Google Classroom – Google Meet
X	4.1 - Nuclear transmutation – introduction, Bohr’s theory of nuclear reactions, classification of nuclear reactions – based on overall energy transformation and the nature of the bombarding particles, nuclear reactions versus chemical reactions.	Modern Inorganic Chemistry by R. D. Madan.	Google Classroom – Google Meet
XI	4.2 - Artificial radioactivity - discovery, reactions emitting electrons and positrons, preparation of trans-uranium elements.	Modern Inorganic Chemistry by R. D. Madan.	Google Classroom – Google Meet
XII	Unit 4.3 & 4.4 - Nuclear fission - nuclear energy - nuclear reactors - breeder reactor, nuclear power projects in India, nuclear fusion – thermonuclear reactions – energy source of the sun. and the stars.	Modern Inorganic Chemistry by R. D. Madan, Essentials of Nuclear Chemistry by H J Arnikaar.	Google Classroom – Google Meet
XIII	Unit 5.1 – Micro and macro nutrients - biological importance of Fe, Zn, Mg, Co and Mo.	Fundamental Concepts of Applied Chemistry by Jayashree Ghosh and eppathshala.	Google Classroom – Google Meet
XIV	Unit 5.2 - Biological role of Na, K, Ca and P.	Fundamental Concepts of Applied Chemistry by Jayashree Ghosh and eppathshala.	Google Classroom – Google Meet
XV	Unit 5.3 & 5.4 - Inorganic medicinal chemistry - radio pharmaceuticals, chelate therapy and contrast agents in MRI, toxicity of As, Hg, Cd, Pb and Cr.	Fundamental Concepts of Applied Chemistry by	Google Classroom – Google Meet

		Jayashree Ghosh and epgpathshala.	
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Auxilium College (Autonomous), Vellore - 6
Odd Semester Lesson Plan (2021-2022)
Dr. J. Rosaline Ezhilarasi
UCCHD20 - General Chemistry III

Week	Portions to be Covered	References	Platform (LMS)
I	Unit 5.1 - The Solid State - differences between crystalline and amorphous solids, elements of symmetry, unit cell, space lattice, Bravais lattices, law of rational indices and Miller indices.	Principles of Physical Chemistry by B. R. Puri, L. R Sharma and M.S Pathania.	Google Classroom – Google Meet
II	Unit 5.2 - X - ray diffraction – derivation of the Bragg’s equation – experimental methods – Laue’s method and powder method.	Principles of Physical Chemistry by B. R. Puri, L. R Sharma and M.S Pathania.	Google Classroom – Google Meet
III	Unit 5.3 - Types of crystals - characteristics of molecular and covalent crystals.	Principles of Physical Chemistry by B. R. Puri, L. R Sharma and M.S Pathania.	Google Classroom – Google Meet
IV	Unit 5.3 - Characteristics of metallic and ionic crystals.	Principles of Physical Chemistry by B. R. Puri, L. R Sharma and M.S Pathania.	Google Classroom – Google Meet

V	Unit 4.1 - Alcohols - reactions of alcohols with Na, HX, esterification, oxidation with alkaline KMnO_4 .	A Text Book of Organic Chemistry by B. S. Bahl and Arun Bahl, P. L. Soni.	Google Classroom – Google Meet
VI	Unit 4.1 - Alcohols - reactions of alcohols with acidic dichromate, con HNO_3 , catalytic dehydrogenation.	A Text Book of Organic Chemistry by B. S. Bahl and Arun Bahl, P. L. Soni.	Google Classroom – Google Meet
VII	Unit 4.2 – Preparation of glycol.	A Text Book of Organic Chemistry by B. S. Bahl and Arun Bahl, P. L. Soni.	Google Classroom – Google Meet
VIII	Unit 4.2 – Properties and uses of glycol.	A Text Book of Organic Chemistry by B. S. Bahl and Arun Bahl, P. L. Soni.	Google Classroom – Google Meet
IX	Unit 4.3 – Preparation of glycerol.	A Text Book of Organic Chemistry by B. S. Bahl and Arun Bahl, P. L. Soni.	Google Classroom – Google Meet
X	Unit 4.3 – Properties and uses of glycerol.	A Text Book of Organic Chemistry by B. S. Bahl and Arun Bahl, P. L. Soni.	Google Classroom – Google Meet
XI	Unit 4.4 - Ethers- isomerism, preparation by Williamson synthesis.	A Text Book of Organic Chemistry by B. S. Bahl and Arun Bahl, P. L. Soni.	Google Classroom – Google Meet
XII	Unit 4.4 – Ethers - reactions of ethers.	A Text Book of Organic Chemistry by B. S. Bahl and Arun Bahl, P. L. Soni.	Google Classroom – Google Meet
XIII	Unit 4.5 - Epoxides- preparation from alkene.	A Text Book of Organic Chemistry by B. S. Bahl and Arun Bahl, P. L. Soni.	Google Classroom – Google Meet
XIV	Unit 4.5 - Epoxides - ring opening reactions.	A Text Book of Organic Chemistry by B. S. Bahl and Arun Bahl, P. L. Soni.	Google Classroom – Google Meet
XV	Unit 4.6 – Reactions of epoxides with alcohol, ammonia derivative and LiAlH_4 .	A Text Book of Organic Chemistry by B. S. Bahl and Arun Bahl, P. L. Soni.	Google Classroom – Google Meet

Auxilium College (Autonomous), Vellore - 6
Odd Semester Lesson Plan (2021-2022)
Dr. J. Rosaline Ezhilarasi
PCCHK20 - Molecular Spectroscopy

Week	Portions to be Covered	References	Platform (LMS)
I	Unit 3.4 - Mossbauer spectroscopy - Mossbauer effect, recoilless emission and absorption, Doppler effect.	Physical Methods in Inorganic Chemistry by R.S. Drago.	Google Classroom – Google Meet
II	Unit 3.4 - Hyperfine interaction - chemical isomer shift, quadruple interaction and magnetic splitting.	Physical Methods in Inorganic Chemistry by R.S. Drago.	Google Classroom – Google Meet
III	Unit 3.5 - Instrumentation - selection of suitable source, limitations.	Physical Methods in Inorganic Chemistry by R.S. Drago.	Google Classroom – Google Meet
IV	Unit 3.6 - Interpretation of spectra - bonding and structures of Fe ²⁺ and Fe ³⁺ compounds, Sn ²⁺ and Sn ⁴⁺ compounds and detection of oxidation states and in-equivalent MB atoms.	Physical Methods in Inorganic Chemistry by R.S. Drago.	Google Classroom – Google Meet
V	Unit 3.6 - Applications of Mossbauer spectroscopy.	Physical Methods in Inorganic Chemistry by R.S. Drago.	Google Classroom – Google Meet
VI	Unit 4.1 - ESR - principle, origin of an EPR signal, derivative spectra.	Physical Methods in Inorganic Chemistry by R.S. Drago.	Google Classroom – Google Meet
VII	Unit 4.1 - g value - factors affecting the magnitude of g values, anisotropy.	Physical Methods in Inorganic Chemistry by R.S. Drago.	Google Classroom – Google Meet
VIII	Unit 4.1 - hyperfine splitting - hyperfine coupling constant, relative intensities of EPR signals.	Physical Methods in Inorganic Chemistry by R.S. Drago.	Google Classroom – Google Meet
IX	Unit 4.2 - Interpretation of the spectra of simple carbon centered free radicals, hyperfine splitting in Cu and Mn compounds, zero field splitting and Kramer's degeneracy.	Physical Methods in Inorganic Chemistry by R.S. Drago.	Google Classroom – Google Meet
X	Unit 4.3 - Electron delocalization – Mc Connell's equation, line width in solid state EPR.	Physical Methods in Inorganic Chemistry by R.S. Drago.	Google Classroom – Google Meet

XI	Unit 4.3 - Applications of EPR.	Physical Methods in Inorganic Chemistry by R.S. Drago.	Google Classroom – Google Meet
XII	Unit 4.4 - Photoelectron spectroscopy – Photo electric effect, UV and X-ray PES, Koopmans' theorem, fine structure in PES.	Physical Methods in Inorganic Chemistry by R.S. Drago, Spectroscopy by Kaur, eppathshala.	Google Classroom – Google Meet
XIII	Unit 4.5 - Interpretation of photo electron spectra of H ₂ , N ₂ , O ₂ , CO, NO, N ₂ O.	Physical Methods in Inorganic Chemistry by R.S. Drago, Spectroscopy by Kaur, eppathshala.	Google Classroom – Google Meet
XIV	Unit 4.5 - Interpretation of photo electron spectra of H ₂ O, azide, HCl and NH ₃ .	Physical Methods in Inorganic Chemistry by R.S. Drago, Spectroscopy by Kaur, eppathshala.	Google Classroom – Google Meet
XV	Unit 4.6 - Electron Spectroscopy for Chemical Analysis – applications of ESCA.	Physical Methods in Inorganic Chemistry by R.S. Drago, Spectroscopy by Kaur, eppathshala.	Google Classroom – Google Meet

Auxilium College (Autonomous), Vellore - 6

Even Semester Lesson Plan

2021-2022

Dr. J. Rosaline Ezhilarasi

UCCHJ19 - Coordination Chemistry

Week	Portions to be Covered	References	Platform (LMS)
I	Unit I - Co-ordination compounds: Definition of terms used – classification of ligands – chelation and effect of chelation – applications – co-ordination number and stereochemistry of complexes.	Coordination Chemistry by M. Satake Y. Mido, Coordination Chemistry by Gurdeep Chatwal and M. S. Yadav, Concise Coordination Chemistry by R Gopalan and V Ramalingam.	Google Classroom – Google Meet

II	Unit I – Nomenclature of Coordination compounds.	Coordination Chemistry by M. Satake Y. Mido.	Google Classroom – Google Meet
III	Unit I - Isomerism in complexes – conformation isomerism, ionization isomerism, hydrate isomerism, linkage isomerism, ligand isomerism, coordination isomerism, co-ordination position isomerism, polymerization isomerism, geometrical and optical isomerism in 4 and 6 co-ordinated complexes.	Modern Inorganic Chemistry by R. D. Madan.	Google Classroom – Google Meet
IV	Unit II - Theory of coordination compounds – Werner theory and its experimental verifications.	Modern Inorganic Chemistry by R. D. Madan.	Google Classroom – Google Meet
V	Unit II - Sidgwick theory - EAN rule-limitations.	Modern Inorganic Chemistry by R. D. Madan and Advanced Inorganic Chemistry by Cotton and Wilkinson.	Google Classroom – Google Meet
VI	Unit II - Theory of bonding - Valence bond theory – hybridization, geometry and magnetic properties – failures of VBT.	Modern Inorganic Chemistry by R. D. Madan.	Google Classroom – Google Meet
VII	Unit III - Crystal Field theory – Factors affecting the magnitude Δ_o - spectrochemical series - splitting of d – orbitals in octahedral, tetrahedral and square planar complexes.	Modern Inorganic Chemistry by R. D. Madan.	Google Classroom – Google Meet
VIII	Unit III - Crystal field stabilization energy – Calculation of CFSE in octahedral and tetrahedral complexes – low spin and high spin complexes.	Modern Inorganic Chemistry by R. D. Madan.	Google Classroom – Google Meet

IX	Unit III - Explanation of magnetic properties and colour using CFT. Comparison between VBT and CFT.	Modern Inorganic Chemistry by R. D. Madan.	Google Classroom – Google Meet
X	Unit IV - Covalency in transition metal complexes: Evidences for covalency. Molecular Orbital theory: Metal orbitals and elementary idea, ligand orbitals suitable for σ and π bonding in octahedral Geometry.	Modern Inorganic Chemistry by R. D. Madan and Selected Topics in Inorganic Chemistry by Wahid U. Malik, G. D. Tuli and R. D. Madan.	Google Classroom – Google Meet
XI	Unit IV - Construction of qualitative MO energy level diagram for σ – bonding in octahedral geometry. Effect of π bonding on the value of Δ_o .	Selected Topics in Inorganic Chemistry by Wahid U. Malik, G. D. Tuli and R. D. Madan.	Google Classroom – Google Meet
XII	Unit IV - Relationship between π bonding ability of ligands and spectrochemical series, Comparison between CFT and MO theories.	Selected Topics in Inorganic Chemistry by Wahid U. Malik, G. D. Tuli and R. D. Madan.	Google Classroom – Google Meet
XIII	Unit V - Pi acceptor ligands: Syntheses, properties of carbonyls of Ni, Cr, Fe.	Modern Inorganic Chemistry by R. D. Madan.	Google Classroom – Google Meet
XIV	Unit V - Syntheses, properties of carbonyls of Co, Mn, W and Mo.	Modern Inorganic Chemistry by R. D. Madan.	Google Classroom – Google Meet
XV	Unit V - bonding, hybridization and structures of carbonyls of Ni, Cr, Fe, Co, Mn, W and Mo.	Modern Inorganic Chemistry by R. D. Madan.	Google Classroom – Google Meet

Auxilium College (Autonomous), Vellore - 6

Even Semester Lesson Plan

2021-2022

Dr. J. Rosaline Ezhilarasi

UCCHE20- General Chemistry IV

Week	Portions to be Covered	References	Platform (LMS)
I	Unit 5.1 - Entropy – the concept of entropy, entropy changes in isothermal expansion of an ideal gas, in reversible and irreversible processes, entropy change accompanying change of phase.	Principles of Physical Chemistry by B. R. Puri, L. R Sharma and M.S Pathania.	Google Classroom – Google Meet
II	Unit 5.1 - Calculation of entropy changes with changes in T, V, and P, entropy changes in different processes, entropy of a mixture of ideal gases, entropy of mixing, physical significance of entropy.	Principles of Physical Chemistry by B. R. Puri, L. R Sharma and M.S Pathania.	Google Classroom – Google Meet
III	Unit 5.2 - Helmholtz and Gibbs free energy functions, variation of free energy change with T and P.	Principles of Physical Chemistry by B. R. Puri, L. R Sharma and M.S Pathania.	Google Classroom – Google Meet
IV	Unit 5.2 - Maxwell's relations, criteria for reversible and irreversible processes, Gibbs-Helmholtz equation.	Principles of Physical Chemistry by B. R. Puri, L. R Sharma and M.S Pathania.	Google Classroom – Google Meet
V	Unit 5.3 - Partial molar properties – concept of chemical potential, the Gibbs-Duhem equation, variation of chemical potential with temperature and pressure.	Principles of Physical Chemistry by B. R. Puri, L. R Sharma and M.S Pathania.	Google Classroom – Google Meet
VI	Unit 5.3 - Chemical potential in a system of ideal gases, Clausius-Clapeyron equation – applications.	Principles of Physical Chemistry by B. R.	Google Classroom – Google Meet

		Puri, L. R Sharma and M.S Pathania.	
VII	Unit 5.4 - Third law of thermodynamics - Nernst heat theorem, statement of third law.	Principles of Physical Chemistry by B. R. Puri, L. R Sharma and M.S Pathania.	Google Classroom – Google Meet
VIII	Unit 5.4 - Determination of absolute entropies of solids, liquids and gases, residual entropy.	Principles of Physical Chemistry by B. R. Puri, L. R Sharma and M.S Pathania.	Google Classroom – Google Meet
IX	Unit 4.1 - Alcohols - reactions of alcohols with Na, HX, esterification, oxidation with alk. KMnO_4 , acidic dichromate, con HNO_3 , catalytic dehydrogenation.	Textbook of Organic Chemistry, P.L. Soni and H.M. Chawla and Advanced Organic Chemistry by Bahl and Arun Bahl.	Google Classroom – Google Meet
X	Unit 4.2 - Dihydric alcohol-glycol- preparation, properties and uses,	Textbook of Organic Chemistry, P.L. Soni and H.M. Chawla and Advanced Organic Chemistry by Bahl and Arun Bahl.	Google Classroom – Google Meet
XI	Unit 4.2 - Trihydric alcohol – Glycerol- preparation, properties and uses.	Textbook of Organic Chemistry, P.L. Soni and H.M. Chawla and Advanced Organic Chemistry by Bahl and Arun Bahl.	Google Classroom – Google Meet
XII	Unit 4.3 - Ethers- isomerism, preparation by Williamson synthesis.	Textbook of Organic Chemistry, P.L. Soni	Google Classroom – Google Meet

		and H.M. Chawla and Advanced Organic Chemistry by Bahl and Arun Bahl.	
XIII	Unit 4.3 - Reactions of ethers.	Textbook of Organic Chemistry, P.L. Soni and H.M. Chawla and Advanced Organic Chemistry by Bahl and Arun Bahl.	Google Classroom – Google Meet
XIV	Unit 4.4 - Epoxides- preparation from alkene, ring opening reactions.	Textbook of Organic Chemistry, P.L. Soni and H.M. Chawla and Advanced Organic Chemistry by Bahl and Arun Bahl.	Google Classroom – Google Meet
XV	Unit 4.4 - Reaction with alcohol, ammonia derivative and LiAlH_4 .	Textbook of Organic Chemistry, P.L. Soni and H.M. Chawla and Advanced Organic Chemistry by Bahl and Arun Bahl.	Google Classroom – Google Meet

Auxilium College (Autonomous), Vellore - 6

Even Semester Lesson Plan

2021-2022

Dr. J. Rosaline Ezhilarasi

PCCHE20 – Advanced Coordination Chemistry

Week	Portions to be Covered	References	Platform (LMS)
I	Unit 2.1 - CFT - salient features of CFT, crystal field splitting of d-orbitals in octahedral complexes.	Concise Coordination Chemistry by R. Gopalan, Selected Topics in Inorganic Chemistry by Wahid U. Malik, G. D. Tuli, R. D. Madan.	Google Classroom – Google Meet
II	Unit 2.1 - Factors affecting the magnitude of Δ_o ,	Concise Coordination Chemistry by R. Gopalan, Selected Topics in Inorganic Chemistry by Wahid U. Malik, G. D. Tuli, R. D. Madan.	Google Classroom – Google Meet
III	Unit 2.1 - Crystal field splitting of d-orbitals in tetrahedral, tetragonal and square planar complexes.	Concise Coordination Chemistry by R. Gopalan, Selected Topics in Inorganic Chemistry by Wahid U. Malik, G. D. Tuli, R. D. Madan.	Google Classroom – Google Meet
IV	Unit 2.2 - Consequences of CF splitting - formation of high-spin and low-spin complexes.	Concise Coordination Chemistry by R. Gopalan, Selected Topics in Inorganic Chemistry by Wahid U. Malik, G. D. Tuli, R. D. Madan.	Google Classroom – Google Meet

V	Unit 2.2 - Distribution of d-electrons.	Concise Coordination Chemistry by R. Gopalan, Selected Topics in Inorganic Chemistry by Wahid U. Malik, G. D. Tuli, R. D. Madan.	Google Classroom – Google Meet
VI	Unit 2.3 - CFSE - calculation of CFSE for various d systems in O_h and T_d fields.	Concise Coordination Chemistry by R. Gopalan, Selected Topics in Inorganic Chemistry by Wahid U. Malik, G. D. Tuli, R. D. Madan.	Google Classroom – Google Meet
VII	Unit 2.3 - Uses of CFSE values,	Concise Coordination Chemistry by R. Gopalan, Selected Topics in Inorganic Chemistry by Wahid U. Malik, G. D. Tuli, R. D. Madan.	Google Classroom – Google Meet
VIII	Unit 2.3 - Applications of CFT, limitations.	Concise Coordination Chemistry by R. Gopalan, Selected Topics in Inorganic Chemistry by Wahid U. Malik, G. D. Tuli, R. D. Madan.	Google Classroom – Google Meet
IX	Unit 2.4 - Jahn-Teller distortion - theorem, z-in and z-out cases.	Concise Coordination Chemistry by R. Gopalan, Selected Topics in Inorganic Chemistry by Wahid U. Malik, G. D. Tuli, R. D. Madan.	Google Classroom – Google Meet
X	Unit 2.4 - Causes and consequences of Jahn-Teller distortion.	Concise Coordination Chemistry by R. Gopalan, Selected Topics in Inorganic Chemistry by Wahid U.	Google Classroom – Google Meet

		Malik, G. D. Tuli, R. D. Madan.	
XI	Unit 2.5 - MOT - experimental evidences for metal-ligand covalent bonding in complexes, σ -bonding in O_h complexes.	Concise Coordination Chemistry by R. Gopalan, Selected Topics in Inorganic Chemistry by Wahid U. Malik, G. D. Tuli, R. D. Madan.	Google Classroom – Google Meet
XII	Unit 2.5 - Construction of MO diagrams.	Concise Coordination Chemistry by R. Gopalan, Selected Topics in Inorganic Chemistry by Wahid U. Malik, G. D. Tuli, R. D. Madan.	Google Classroom – Google Meet
XIII	Unit 2.6 - Pi-bonding in O_h complexes, effect of π -bonding on the value of Δ_o .	Concise Coordination Chemistry by R. Gopalan, Selected Topics in Inorganic Chemistry by Wahid U. Malik, G. D. Tuli, R. D. Madan.	Google Classroom – Google Meet
XIV	Unit 2.6 - Relation between pi bonding ability of ligands and spectrochemical series,	Concise Coordination Chemistry by R. Gopalan, Selected Topics in Inorganic Chemistry by Wahid U. Malik, G. D. Tuli, R. D. Madan.	Google Classroom – Google Meet
XV	Unit 2.6 - Comparison of CFT with MOT.	Concise Coordination Chemistry by R. Gopalan, Selected Topics in Inorganic Chemistry by Wahid U. Malik, G. D. Tuli, R. D. Madan.	Google Classroom – Google Meet

Academic Year : 2021-2022
Class : B.Sc Chemistry - III year
Subject : Organic Chemistry
Hours / Week : 4
Credits : 4

Semester : V
Class Code : U17
Subject Code : UCCH119
Total Hours : 60
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	4	I 1.1	Projection formulae, CIP Rules, R,S Configuration,	Chalk & Board, Power point, Videos	Reactions and Reagents - O.P. Agarwal	Quiz, Written test
II	4	I 1.2 1.3	Optical activity in compounds not containing asymmetric carbon atoms, Cis-trans, syn-anti and E-Z notations	Chalk & Board, Power point, Videos	Reactions and Reagents - O.P. Agarwal	Quiz, Written test
III	4	I 1.3 1.4	Distinguishing geometrical isomers using physical and chemical methods.	Chalk & Board, Power point, Videos.	Reactions and Reagents - O.P. Agarwal	Quiz, Written test
IV	4	II 2.1 2.2	Tautomerism - keto-enol, nitro-aci nitro and amido-iminol	Chalk & Board, Power point, Videos	Reactions and Reagents - O.P. Agarwal	Quiz, Written test
V	4	II 2.3	Conformational Analysis of ethane and n butane	Chalk & Board, Power point, Videos	Reactions and Reagents - O.P. Agarwal	Quiz, Written test
VI	4	II 2.4	Conformers of mono and disubstituted cyclohexane.	Chalk & Board, Power point, Videos	Reactions and Reagents - O.P. Agarwal	Quiz, Written test

4	II 3-1	Active methylene compounds - Synthetic use of acetoacetic, malonic and cyano-acetic esters	Chalk and Board, Power point, Videos	Reactions and Reagents - O.P. Agarwal	Quiz Written Test
4	III 3-2 3-3	Basic concepts of organic photochemistry Nonrush type I, type II, photo reduction reduction, addition and isomerization	Chalk and Board Power point, videos	Reactions and Reagents - O.P. Agarwal	Quiz Written Test
4	III 3-4	Photochemical rearrangements, Paterno-Buchi reaction, Barton reaction, Photo Fries reaction.	Chalk and Board Power point, Videos.	Reactions and Reagents - O.P. Agarwal	Quiz Written Test
4	IV 4-1 4-2	Mechanism of Aldol, Benzoin and Darzen condensation. Claisen, Cannizzaro, and Reformatsky reactions	Chalk and Board Power point	Reactions and Reagents - O.P. Agarwal	Quiz, TB, FC Written Test Seminar
4	IV 4-2 4-3	Perkin, Knoevenagel, Michael addition, haloform, Dakin, Wittig and Dieckmann reactions	Chalk and Board Power point	Reactions and Reagents - O.P. Agarwal	Quiz, TB, FC Written Test Seminar
4	IV 4-4	Mechanism of reduction with NaBH_4 , LiAlH_4 , Wolff Kishner and MPV reduction	Chalk and Board Power point	Reactions and Reagents - O.P. Agarwal	Quiz, TB, FC Written Test Seminar
4	V 5-1	Molecular rearrangements - anisotropic, cationotropic, inter and intra. Pinacol - Pinacolone rearrangement	Chalk and Board Power Point	Reactions and Reagents - O.P. Agarwal	Quiz, TB, FC Written Test Seminar
	V 5.2	Beckmann rearrangement, Baeyer Villiger oxidation	Chalk and Board Power Point	Reactions and Reagents - O.P. Agarwal	Quiz, TB, FC Written Test Seminar
	V	Benidine rearrangement, Claisen	Chalk and Board	Reactions and Reagents - O.P. Agarwal	Quiz, TB, FC Written Test Seminar

: 2021 - 2022
 : M.Sc. Chemistry - II year
 : Synthetic Organic Chemistry
 : 2
 : 4

Semester : III
 Class Code : P14
 Subject Code : PCHJ20
 Total Hours : 30
 Total Marks : 100

Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	Retrosynthesis, disconnection approach, Synthesis, linear and convergent synthesis	Chalk & Board, Power Point, Videos	Disconnection Approach - Stuart Warren	Quiz, Written Test
I	One group C-X disconnection and two group C-X disconnection, Unpolarity of reactivity	Chalk & Board, Power Point, Videos	Disconnection Approach - Stuart Warren	Quiz Written Test
I	Protection of functional group (hydroxyl, amino, carbonyl and carboxyl groups)	Chalk & Board, Power Point, Videos	Disconnection Approach Stuart Warren	Quiz Written Test
I	Synthesis of target molecules based on disconnection and synthon approach Aspirin, 3-methylpentene, methyl 3-phenylbutanoate	Chalk & Board, Power Point, Videos	Disconnection Approach Stuart Warren	Quiz Written Test
I	Cis-1-isopropyl-2-benzyl ethylene, 2,6-dibromoaniline, reserpine	Chalk & Board, Power Point, Videos	Disconnection Approach Stuart Warren	Quiz Written Test
I	Saccharine, paracetamol, morpholine	Chalk & Board, Power Point, Videos	Disconnection Approach Stuart Warren	Quiz Written Test

X	2	II	Diaxial/equatorial, practicality, types of ligands and faces, homotopic heterotopic and enantiotopic	Advanced Organic Chemistry by Clayden & Greeves	Chalk & Board, Power Point	Quiz & written test
XI	2	II	Asymmetric synthesis, chiral auxiliaries, methods of asymmetric induction, substrate	Advanced Organic Chemistry by Clayden & Greeves	Chalk & Board, Power Point	Quiz & written test
XII	2	II	Reagent and catalyst controlled reactions (Examples)	Advanced Organic Chemistry by Clayden & Greeves	Chalk & Board, Power Point	Quiz & written test
XIII	2	II	Determination of enantiomeric and diastereomeric excess, enantiomeric discrimination	Advanced Organic Chemistry by Clayden & Greeves	Chalk & Board, Power Point	Quiz & written test
XIV	2	II	Methods of resolution, mechanical separation, formation of diastereomers	Advanced Organic Chemistry by Clayden & Greeves	Chalk & Board, Power Point	Quiz & written test
XV	2	II	Chromatography and biochemical transformation	Advanced Organic Chemistry by Clayden & Greeves	Chalk & Board, Power Point	Quiz & written test
XVI	2	V	Chemoselectivity - reduction and oxidation - examples, calculation	Advanced Organic Chemistry by Clayden & Greeves	Chalk & Board, Power Point	Quiz & written test
XVII	2	V	Regioselectivity - Birch reduction Stereoselectivity - principle	Advanced Organic Chemistry by Clayden & Greeves	Chalk & Board, Power Point	Quiz & written test
XVIII	2	V	Diastereoselective reaction - Hydroboration	Advanced Organic Chemistry by Clayden & Greeves	Chalk & Board, Power Point	Quiz & written test

Academic Year : 2021-2022
 Class : B.Sc. Chemistry - 1st year
 Subject : General Chemistry 1
 Hours / Week : 2
 Credits : 5

Semester : 1
 Class Code : U17
 Subject Code : UCHH20
 Total Hours : 30
 Total Marks : 100

S. No.	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
1	2	I	Bridge Course - Hydrocarbons, classification of functional groups, isomerism, common organic reactions	Chalk & Board, Power point, Videos	Organic Chemistry - Sone P.k	Quiz & Written Test
2	2	I	Valency, Oxidation number, oxidation & reduction, Calculation of oxidation state, Oxidising & Reducing agent	Chalk & Board, Power Point, Videos	Advanced Inorganic Chemistry - R.D. Madan	Quiz & Written Test
3	2	I	Balancing chemical equations - Oxidation number method and Ion electron method	Chalk & Board, Power Point, Videos	Advanced Inorganic Chemistry - R.D. Madan	Quiz & Written Test
4	2	II	Modern periodic law, General classification of elements in periodic table, General characteristics of s and p block elements	Chalk & Board, Power Point, Videos	Advanced Inorganic Chemistry - R.D. Madan	Quiz & Written Test
5	2	II	General characteristics of d and f block elements	Chalk & Board, Power Point, Videos	Advanced Inorganic Chemistry - R.D. Madan	Quiz & Written Test
6	2	IV	Acids and Bases - Concepts - Arrhenius, Lowry - Bronsted and Lewis acid-base theory, acid-base equilibria	Chalk & Board, Power point	Physical Chemistry - Puri & Sharma	Quiz & Written Test

16	5	Preparation of ppt. of strong and weak acid, solubility calculations	Chalk & Board	Physical chemistry - Puri & Sharma	Quiz = Written Test
17	2	Hard and soft acids and bases	Chalk & Board	Physical chemistry - Puri & Sharma	Quiz = Written Test
18	5	Buffer solutions, relative strength of acids and bases from K_a and K_b values	Chalk & Board	Physical chemistry - Puri & Sharma	Quiz = Written Test
19	2	Henderson - Hasselbalch equations	Chalk & Board	Physical chemistry - Puri & Sharma	Quiz = Written Test
20	2	Common ion effect, concept of sparingly soluble salts	Chalk & Board	Practical chemistry - O.P. Pandey	Quiz = Written Test
21	2	Solubility product principle, relation between solubility and solubility product	Chalk & Board	Physical chemistry - O.P. Pandey	Quiz = Written Test
22	2	Application of common ion effect and solubility product principle in inorganic qualitative analysis	Chalk & Board	Physical chemistry - O.P. Pandey	Quiz = Written Test
23	2	Eliminating the interfering radicals Significance of sodium carbonate extract	Chalk & Board	Practical chemistry - O.P. Pandey	Quiz = Written Test
		Spot test reagents - Magnesium, Aluminium		Practical chemistry	Quiz =

LESSON PLAN

Academic Year : 2021-2022
Class : B.Sc Chemistry - III year
Subject : Chemistry of Natural Products
Hours / Week : 4
Credits : 5

Semester : VI
Class Code : U17
Subject Code : UECHC-17
Total Hours : 60
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	4	I	Carbohydrates - classification, Ascending and descending of carbon chains in sugars Glucose & Fructose - Constitution	Power point, Chalk & Board	Advanced Organic Chemistry - Balke Bal Chem of Nat Prod Lundepchatmolek	Group discussion & Written Test
II	4	I	Reactions of glucose and fructose. Mutarotation, Determination of ring size	"	"	"
III	4	I	Epimerisation, Interconversion of aldoses and ketoses, Sucrose, maltose, starch and cellulose - structural elucidation	"	"	"
IV	4	II	Amino acids and proteins - classification Preparation of alpha amino acids	"	"	"
V	4	II	Properties and Reactions	"	"	"
VI	4	II	Peptide bond, synthesis Proteins - classification Primary & Secondary structure	"	"	"

Academic Year : 2021 - 2022
 Class : M.Sc. Chemistry - II year
 Subject : Organometallic and Bioinorganic Chemistry
 Hours / Week : 3
 Credits : 5

Semester : IV
 Class Code : P114
 Subject Code : PECH0220
 Total Hours : 45
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	3	I	Introduction - 18 electron rule and EAN rule - calculation, capacity - definition Carbonyl complexes - preparation & property	Chalk & Board Power point	Organometallic Chemistry of Transition Metals Robert H. Crabtree	Group discussion Written test
II	3	I	Carbonyl complexes - structure & bonding, Carbonylate ion, carbonyl hydride complex - preparation, properties, structure & bonding	"	"	"
III	3	I	Nitrosyl complex, metal alkyls - preparation, properties, structure and bonding	"	"	"
IV	3	I	Carbenes, carbynes and carbidic, non - aromatic alkenes and alkyne complexes - preparation & properties	"	"	"
V	3	I	Metallocenes - preparation and properties, structure & bonding	"	"	"
VI	3	IV	Metalloporphyrin and respiration (Cytochromes), Interaction between heme and dioxygen, structure & function of hemoglobin	"	Bioinorganic Chemistry by Asim K Das	"

Academic Year : 2021 - 2022
Class : B.Sc Chemistry - I year
Subject : General Chemistry II
Hours / Week : 2
Credits : 6

Semester : II
Class Code : 017
Subject Code : UCCHA20
Total Hours : 30
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
	2	III	Election displacement effects - Inductive effect - effect on bond length, dipole moment, reactivity of alkyl halides.	Chalk & Board Power point	Reaction mechanism including reaction intermediates Akmalash	Group discuss & Written test
	2	III	Strength of carbonylic acids and basic character of amines, Electromeric effect, Comparison with inductive effect	"	"	"
	2	III	Mesomeric effect, comparison with inductive effect	"	"	"
	2	III	Hyper conjugation, Steric effect	"	"	"
	2	III	Bond fission - homolytic and heterolytic, reaction intermediates, Carbocations - generation, structure, stability & Reactions	"	"	"
	2	III	Carbanions - generation, structure, stability and reactions	"	"	"

LESSON PLAN

Advanced organic chem by Bal & Aron Bal & Aron	Chalk & Board	Characterisation - hybridisation of sp ³ hybrid orbitals.	VII	3	III
Advanced org chem by Bal & Aron	Chalk & Board	Geometry of molecules - methane, ethane, ethylene, acetylene & benzene.	VIII	3	III
Principles of Phy. chemistry by Puri & Sharma	Chalk & Board	Classical Mechanics - the elm of an e ⁻ . Rutherford's scattering experiment.	IX	3	IV
Principles of Phy. chemistry by Puri & Sharma	Chalk & Board	Bohr theory and Sommerfeld extension of Bohr theory	X	3	V
Textbook of Phy. chem by P.L. Soni	Chalk & Board	Photoelectric effect and Compton effect	XI	3	V
Principles of Phy. chemistry by Puri & Sharma	Chalk & Board	Davisson & Germer experiment Heisenberg's uncertainty principle	XII	3	V
Principles of Phy. chemistry by Puri & Sharma	Chalk & Board	Quantum mechanics - Schrodinger wave equation	XIII	3	V
Principles of Phy. chemistry by Puri & Sharma	Chalk & Board	Significance of wave equation (No derivation)	XIV	3	V
Principles of Phy. chemistry by Puri & Sharma	Chalk & Board	Radial and angular wave functions	XV	3	V

(function, Radical Probability, Mixtures) Board (Physical Chem) Written Test

LESSON PLAN

Academic Year : 2021-2022
 Class : M.Sc Chemistry - II Year
 Subject : Electrochemistry
 Hours / Week : 3 hrs / week
 Credits : 4

Semester : III
 Class Code : PT4
 Subject Code : PCHL20
 Total Hours : 45 hrs
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	3	I	Activity and Activity Coefficient Ionic Strength and related Problems	Chalk & Board Power Point Videos	Introduction to Electrochemistry by Samuel Classstone	Assignments Test on Problems
II	3	I	Debye Huckel Theory of strong Electrolytes - Determinants of activity Coefficient.	Chalk & Board Power Point and Videos	Principles of Physical Chemistry by Puri & Sharma	Oral Test.
III	3	II	Polarography - Theory - Instrumentation - qualitative and quantitative application	Chalk & Board Power Point Videos.	Instrumental Methods of Chemical Analysis by M.S. Yadav	Written Test.
IV	3	II	Amperometric Titrations - Theory Types of titration curves - Bi-amperometric titration and app.	Chalk & Board Power Point Videos.	Instrumental Methods of Chemical Analysis by M.S. Yadav	Assignment & Written Test.
V	3	II	Cyclic Voltammetry, Theory, Instrumentation and its application to Inorganic System.	Principles of Instrumental methods of Ana by D. A. Skoog	Chalk & Board Power Point Videos.	Assignment Quiz
VI	3	II	Potentiometric titrations - Equivalence Point potential for Fe^{2+}/Fe^{3+} , MnO_4^- , H^+/Mn^{2+} Systems	Chalk & Board Power point Videos	Principles of Instrumental methods by D.A. Skoog	Assignment Oral Test

<u>VII</u>	I	<u>II</u>	Thermogravimetric analysis of polymers	Power Point	Polymer Science by V.R. Gowarikar	Assignment
<u>VIII</u>	I	<u>II</u>	Relation to structure Surface morphology - SEM	Power Point	Polymer Science by V.R. Gowarikar	Assignment
<u>IX</u>	I	<u>II</u>	Size of the particle determination - TEM	Chalk & Board Power Point	Polymer Science by V.R. Gowarikar	Assignment
<u>X</u>	I	<u>V</u>	Biopolymers - natural - starch, cellulose etc.	Chalk & Board Power Point	Polymer Science by V.R. Gowarikar	Quiz
<u>XI</u>	I	<u>V</u>	Synthetic Polymers - PVA, PVP, PLA	Chalk & Board Power Point	Polymer Science by V.R. Gowarikar	Oral Test
<u>XII</u>	I	<u>V</u>	Biomedical application of biopolymers - dental etc.	Power Point Chalk & Board	Journals Polymer Science Book	Quiz
<u>XIII</u>	I	<u>V</u>	Biomedical application of biopolymers in tissue eng.	Power Point Chalk & Board	Research Papers R. Joel Polymer	Oral Test
<u>XIV</u>	I	<u>V</u>	Industrial applications of biopolymers Packaging	Power Point Chalk & Board	Polymer Sci & Tech by R. Joel	Oral Test
<u>XV</u>	I	<u>V</u>	Industrial applications of polymers in electronics	Power Point Chalk & Board	Polymer Sci & Tech by R. Joel	Oral Test

LESSON PLAN

Academic Year : 2021 - 2022

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Semester :

II

Class :

B.Sc. Chemistry - 7th Year

Class Code :

3117

Academic Year : 2021-22
Class : M.Sc. Chemistry - II Year
Subject : Chemistry (Natural Products and Bioorganic)
Hours / Week : 2 hrs/week
Credits : 4

Semester : II
Class Code : P14
Subject Code : PCCH
Total Hours : 30hrs
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	2	II	Amino acids - metabolism of amino acids - oxidative deamination, transamination, urea cycle	Chalk & Board	Organic Chemistry by I.L. Finar Gurdeep Chahal	Assignment
II	2	II	Peptides - Synthesis of tripeptide - Solid phase peptide synthesis - Merrifield synthesis.	Chalk & Talk Method	Principles of Biochemistry by Lehninger	Test
III	2	II	Separation and Purification of proteins, dialysis, gel filtration and electrophoresis.	Chalk & Board PPT	Organic Chemistry by I.L. Finar.	Test Seminar.
IV	2	II	Structural aspects of Proteins	Chalk & Board.	Organic Chemistry by I.L. Finar	Test.
V	2	II	Determination of structure of proteins by XRD method	Chalk & Board PPT	Organic Chemistry by P.L. Kalsi I.L. Finar.	Test & Quiz
VI	2	II	Biosynthesis of amino acids - Phenyl alanine, tyrosine and proline only	Chalk & Board PPT	Organic Chemistry by I.L. Finar.	Seminar & Test

XV

2

V

Properties of colloidal systems - Tyndall Effect - Colloids.

Chalk & Board Principles of Biochemistry by P. L. Kalsi Assignment Sharma

LESSON PLAN

Academic Year : 2021-22
 Class : M.Sc. Chemistry - II Year
 Subject : Chemistry (Natural Products and Bioorganic)
 Hours / Week : 2 hrs / week
 Credits : 4

Semester : II
 Class Code : P14
 Subject Code : PCCH
 Total Hours : 30 hrs
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	2	II	Amino acids - metabolism of amino acids - oxidative deamination, transamination & urea cycle.	Chalk & Board	Organic Chem by I.L. Finar Gurdeep, Chak	Assignment
II	2	II	Peptides - Synthesis of tripeptide - solid phase peptide synthesis - Merrifield synthesis.	Chalk & Talk Method	Principles of Biochemistry by Lehninger	Test
III	2	II	Separation and Purification of proteins, dialysis, gel filtration and electrophoresis.	Chalk & Board. PPT.	Organic Chem by I.L. Finar.	Test Seminar.
IV	2	II	Structural aspects of proteins	Chalk & Board.	Organic Chemistry by I.L. Finar	Test
V	2	II	Determination of structure of proteins by XRD method	Chalk & Board PPT.	Organic Chem by P.L. Kalsi I.L. Finar.	Test & Quiz
VI	2	II	Biosynthesis of amino acids - Phenyl alanine, tyrosine and Proline only	Chalk & Board PPT.	Organic Chem by I.L. Finar.	Seminar & Test.

Academic Year : 2021-22
 Class : M.Sc. Chemistry - 2 Year
 Subject : Chemistry (Group Theory & Quantum Chemistry)
 Hours / Week : 3hrs/week
 Credits : 4

Semester : II
 Class Code : P14
 Subject Code : PCCH F20
 Total Hours : 12
 Total Marks : (20+60) = 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	3	I	Introduction - Symmetry elements and symmetry operations, group postulates and types of groups Subgro	Chalk & Board PPT Models	Group Theory and its app. by K.V.Raman	Oral Test
II	3	I	Group Multiplication table, Similarity transformation and classes of Symmetry operatn	Chalk & Board PPT, Models	Group Theory and its app. by K.V.Raman	Assignment
III	3	I	Molecular Point groups - point groups of molecules - point groups of Td, Oh molecules.	Chalk & Board PPT Chem Tube	Group Theory and its app. by K.V.Raman	Oral Test
IV	3	I	Matrices - Matrix representatns of Symmetry Operations, Reduc and Irreducible representations	Chalk & Board PPT	Group Theory and its app. by K.V.Raman	Test
V	3	I	Orthogonality Theorem and its consequences, Properties of irreducible representations	Chalk & Board	Group Theory and its app. by K.V.Raman	Assignment
VI	3	I	Crystallographic Symmetry 32 crystallographic point groups - space groups - Screw Axes	Chalk & Board You tube vide Link Chem	Group Theory by B. Sridhar & K.V.Raman	Test

VII	1	II	Construction of character table for C_{2v} and C_{3v} point groups - explain for C_{2v} & C_{3v}	Chalk & Board PPT	Group They by K.V. Raman	Assignment
VIII	3	II	Selection rules for vibrational IR & Raman Spectra. Mutual Exclusion rule with center of symmetry.	Chalk & Board PPT	Group They by Ramkrishnan	Assignment
IX	3	II	Applications to molecular vibrations (IR & Raman) for symmetry mole. H_2O , CH_4 , NH_3	Chalk & Board.	Group They by K.V. Raman	Assignment
X	3	II	Hybrid orbitals to non-linear molecules CH_4 , XeF_4 , BF_3 , SF_6 , NH_2 . Ethylene & Formaldehyde	Chalk & Board.	Group They by Salabhi. Kung'u	Oral Test.
XI	3	IV	Approximation methods - variational methods - trial wave fun - Hydrogen & Helium.	Chalk & Board.	Quantum Chemistry by A.K. Chaudhary	Test.
XII	3	V	Perturbation method and its application to particle in one dimensional box.	Chalk & Board	Quantum Chemistry by A.K. Chaudhary	Assignment
XIII	3	V	Born-Oppenheimer Approx. - treatment of molecules - application to Helium & Hydrogen	Chalk & Board.	Quantum Chemistry by A.K. Chaudhary	Test
XIV	3	V	Linear combination of Atomic Orbitals (LCAO) - molecules. orbital theory for hydrogen.	Chalk & Board.	Quantum Chemistry by A.K. Chaudhary	Test.
XV	3	V	Molecular orbital theory for conjugated systems.	Chalk & Board.	Quantum Chemistry by A.K. Chaudhary	Test.

VII	4	III	Rice Herzfeld mechanism, stopped flow and flash photolysis method.	Chalk and Board	Fast reactions Srinivasan.	Written test.
VIII	4	IV	Photochemistry - Jablonski diagram, Franck-Condon Principle, radiative and non-radiative transition.	Chalk and Board.	Photochemistry Mukherjee.	Assignment
IX	4	IV	Delayed fluorescence - E and P-type Spin forbidden transition.	Chalk and Board.	photochemistry Mukherjee.	Written test.
X	4	IV	Decay of electronically excited states, kinetics of unimolecular and bimolecular photophysical process.	Chalk and Board. Powerpoint.	photochemistry Gurdeep Singh	Assignment Test
XI	4	IV	Quenching - Stern Volmer equation, kinetics of excimer and exciplex formation.	Chalk and board Powerpoint.	Photochemistry Gurdeep Singh.	Written test.
XII	4	IV	kinetics of photochemical reaction Photosubstitution, photoisomerisation and photosensitization	chalk and board	photochemistry Mukherjee.	Written test. Assignment.
XIII	4	V	Photovoltaic, photogalvanic cells, application of solar energy, radiolysis of water, G-value, hydrated e ⁻ ion pair yield.	chalk and Board. Powerpoint.	Photochemistry Mukherjee.	Assignment. Oral test.
XIV	4	V	Radiation Chemistry - Interaction of high energy radiation with matter. Primary and secondary processes.	Chalk and board. Powerpoint.	Photochemistry Mukherjee.	Written test.
XV	4	V	Photocatalysis - application of TiO ₂ , Photochemical reaction of Vision.	chalk and board.	photochemistry Mukherjee.	Written test.

Academic Year : 2021-2022
 Class : M.Sc. CHEMISTRY - II YEAR.
 Subject : ELECTROCHEMISTRY.
 Hours / Week : 4
 Credits : 4

Semester : II
 Class Code : P14.
 Subject Code : PCCHL20
 Total Hours : 60
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	1	V	Fuel cells - efficiency, types of fuel cells.	Powerpoint.	Electrochemistry Bockris and Reddy.	Assignment.
II	1	V	Alkaline and phosphoric acid fuel cell.	Chalk and Board Powerpoint	Electrochemistry Bockris and Reddy.	Written test. Assignment.
III	1	V	High temperature and solid polymer electrolyte fuel cell.	Chalk and Board Powerpoint	Electrochemistry Bockris and Reddy.	Assignment.
IV	1	V	General developments of fuel cell technology.	Chalk and Board	Electrochemistry Bockris and Reddy.	Written and Oral test.
V	1	V	Electrochemical sensors - ion selective electrodes.	Chalk and Board.	Electrochemistry D.R. Crow.	Written test.
VI	1	V	kinetics of fuel cell.	Chalk and Board	Electrochemistry Bockris and Reddy	Assignment. Written test.

<u>VII</u>	2	<u>IV</u>	photochemistry - laws of light absorption - Lambert law and Lambert - Beer's law.	Chalk and Board	Allied chemistry by Balasubramanian	Assignment
<u>VIII</u>	2	<u>IV</u>	Strothius - Drapers law and Stark - Einstein law of photochemical equivalence.	Chalk and Board	Physical Chemistry by Puri and Sharma	Written Test
<u>IX</u>	2	<u>IV</u>	Quantum yield, photochemical reaction, Jablonski diagram	Chalk and Board	photochemistry by Mukherjee.	Written Test
<u>X</u>	2	<u>IV</u>	Jablonski diagram, Fluorescence.	Chalk and Board	Allied chemistry by Balasubramanian	Written Test
<u>XI</u>	2	<u>IV</u>	Phosphorescence, chemiluminescence.	Chalk and Board	Allied chemistry by Balasubramanian	Written Test.
<u>XII</u>	2	<u>IV</u>	Photosensitization.	Chalk and Board	Allied chemistry by Balasubramanian	Assignment
<u>XIII</u>	2	<u>IV</u>	causes, symptoms, treatment of Diabetes.	Chalk and Board	Allied Chemistry By Balasubramanian	Assignment
<u>XIV</u>	2	<u>IV</u>	causes, symptoms, treatment of cancer.	Chalk and Board	Allied chemistry by Balasubramanian	Assignment
<u>XV</u>	2	<u>IV</u>	causes, symptoms, treatment of AIDS.	Chalk and Board.	Allied Chemistry by Balasubramanian.	Assignment.

Academic Year : 2021-2022.
 Class : II M.Sc. CHEMISTRY.
 Subject : THERMODYNAMICS.
 Hours / Week : 4
 Credits : 5

Semester : IV
 Class Code : PCCH020 (P14)
 Subject Code : PCCH020
 Total Hours : 75
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
<u>I</u>	4	<u>I</u>	partial molar properties - free energy, volume, heat content - significance - determination.	Chalk and Board	Thermodynamics by Samuel Glasstone	Written Test
<u>II</u>	4	<u>I</u>	chemical potential - variation with temperature and pressure, Duhamel Margules equation, standard free energy.	Chalk and Board	Thermodynamics by Samuel Glasstone	Assignment
<u>III</u>	4	<u>I</u>	Determination of standard free energy, Fugacity, activity, activity coefficient and its determination.	Chalk and Board	Thermodynamics by Samuel Glasstone	Written test
<u>IV</u>	4	<u>I</u>	choice of standard states, variation of fugacity with temperature and pressure.	Chalk and Board	Thermodynamics by Samuel Glasstone.	Assignment
<u>V</u>	4	<u>III</u>	Partition function - factorisation, partition function for mixture of gases, evaluation of translational partition fn.	Chalk and Board	Statistical thermodynamics by M.C. Gupta.	Assignment
<u>VI</u>	4	<u>III</u>	Evaluation of Rotational, vibrational, electronic and nuclear partition function.	Chalk and Board.	Statistical thermodynamics by M.C. Gupta.	Written Test

101	+	101	Use of approximation of averages, simple and complex of data.	chalk and board	Statistical theory dynamics by M.C. Gupta	Written Test
102	+	102	Regression of least squares of 1st, 2nd and 3rd order, correlation and other tests.	chalk and board	Statistical theory dynamics by M.C. Gupta	Written Test
103	+	103	Index of numbers, index of price, index of quality, index of production, index of cost.	chalk and board	Statistical theory dynamics by M.C. Gupta	Assignment
104	+	104	Index and price averages, methods for calculation of index, chain in index.	chalk and board	Statistical theory dynamics by M.C. Gupta	Written Test
105	+	105	Statistical quality control - Planck, normal, binomial, poisson, hypergeometric and other tests.	chalk and board	Statistical theory dynamics by M.C. Gupta	Assignment
106	+	106	Application of statistical techniques in the field of spectroscopy and biological tests.	chalk and board	Statistical theory dynamics by M.C. Gupta	Assignment
107	+	107	Non-equilibrium thermodynamics - available, derivation of laws and tests.	chalk and board	Non-equilibrium Thermodynamics by Rajaram Kumbhakar	Written Test
108	+	108	Steady state, entropy production in chemical reactions, open flow, other applications, equilibrium thermodynamics.	chalk and board	Thermodynamics by Rajaram Kumbhakar	Written Test
109	+	109	Use of various methods for non-equilibrium thermodynamics.	chalk and board	Thermodynamics by Rajaram Kumbhakar	Written Test

Semester = EVEN (3)
 Class Code = PH
 Subject Code = PNHRA19
 Total Hours =
 Total Marks = 100

Sl. No.	Th. No.	Th. Title	Teaching Methodology	Learning Resources	Methods of Evaluation
101	101	Introduction and its classification	Chalk and Board	Human rights college book	Assignment
102	102	Basic features of Human constitution	Chalk and Board	Human rights college book	Written test
103	103	Political principles of state policy	Chalk and Board	Human rights college book	Quiz
104	104	Fundamental rights	Chalk and Board	Human rights college book	Quiz
105	105	Constitutional remedies	Chalk and Board	Human rights college book	Written test
106	106	Constitutional remedies	Chalk and Board	Human rights college book	Quiz

Academic Year : 2021 - 2022
 Class : I M.Sc
 Subject : Structural Inorganic chemistry
 Hours / Week : 5/Week
 Credits : 5

Semester : I
 Class Code : P14
 Subject Code : PCCHB20
 Total Hours : 75
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	5	1	Acids and bases, proton transfer equilibria in water - solvent levelling, Aqua acids & polyoxo compounds	Chalk & Board, Power point	Inorganic Chemistry Shriver & Atkins	Written test & Assignments
II	5	1	Lewis acids and bases, group characteristics of Lewis acids Lux & Flood, Usanovich acid and base concepts	Chalk & Board and Power point	Inorganic Chemistry Shriver & Atkins	Oral test
III	5	1	Super acids and bases, solvent & its classification, ionic liquids, Symbiosis and proton sponges.	Chalk & Board and Power Point	Inorganic Chemistry Shriver & Atkins	Oral test & Assignment
IV	5	2	Structure of complex solids, layered structures, Madelung constant, Imperfections in solids	Chalk & Board and Power point	Inorganic Chemistry J.E. Huheey	Written test & Oral test
V	5	2	Band theory, semiconductor and its types, Piezo and Pyro-electric materials & Meissner effect	Chalk & Board and Power point	Inorganic chemistry J.E. Huheey	Written test & Oral test
VI	5	2	BCS theory, Superconductor, Type II and III superconductor, structure of 123 oxides & H _T superconductors	Chalk & Board & Power point	Inorganic chemistry J.E. Huheey	Assignment & Oral test

<u>VII</u>	5	3	Structure of simple solids, unit cell and crystal systems, close packing of spheres and holes in closed packed structures.	Inorganic Videos, PPT & chalk & board	Inorganic chemistry Shriver & Atkins	Oral test & Assignment
<u>VIII</u>	5	3	Structure of metals and alloys, non closed packed structures, Polytropyism and Polymorphism	Videos, PPT, chalk and Board	Inorganic chemistry Shriver & Atkins	Assignment & written test
<u>IX</u>	5	3	Alloys and its types, Structure of ionic solids - binary and ternary phases.	Videos, PPT, Chalk and Board	Inorganic chemistry Shriver & Atkins	Written test & Oral test
<u>X</u>	5	4	Structure and bonding in polyacids - Isopolyacids and heteropolyacids of Molybdenum & Tungsten	PPT, Chalk & Board	Advanced Inorganic chemistry Cotton & Wilkinson	Assignment & Written test
<u>XI</u>	5	4	Silicates and its types, zeolites, feldspar, molecular sieves and ultramarines.	Chalk & Board, PPT	Inorganic chemistry J.E. Huheey	Oral test
<u>XII</u>	5	4	Polysulphur and nitrogen compounds, polythiazyl and polyorgano phosphazenes	Chalk & Board PPT	Inorganic chemistry J.E. Huheey	Assignment
<u>XIII</u>	5	5	Boranes and higher boranes, Wades rule - closo, nido and arachno structures.	Chalk & Board, PPT	Advanced Inorganic chemistry Cotton & Wilkinson	Assignment
<u>XIV</u>	5	5	Carboranes and metallocarboranes Closo, Nido and arachno structures	Power point, chalk & Board	Inorganic chemistry Cotton & Wilkinson	Written test
<u>XV</u>	5	5	Structure and bonding in boronitrides and metal clusters	PPT, Chalk & Board	Inorganic chemistry	Oral

LESSON PLAN

Academic Year : 2021 - 2022
Class : II B.Sc
Subject : Industrial chemistry
Hours / Week : 2 hours / week
Credits : 2

Semester : III
Class Code : U17
Subject Code : USCHA320
Total Hours : 30
Total Marks : 60

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	2	1	Introduction to polymers and classification of polymers	Chalk & Board Power point	Fundamental concepts of Applied chemistry Jayashree Ghosh	Assignment & Oral test
II	2	1	Types of polymerization, Preparation, properties and uses of natural polymer	Chalk & Board Power point	Applied chemistry Jayashree Ghosh	Assignment & Oral test
III	2	1	Preparation, Properties and uses of synthetic rubber, Polyvinyl chloride, polyester and polyamides	Chalk & Board Power point	Applied chemistry Jayashree Ghosh	Written test
IV	2	2	Introduction - constituent of animal skin & Preparation of hides for tanning.	Chalk & Board Power point	Applied chemistry Jayashree Ghosh	Oral test
V	2	2	Processing of leather, Vegetable and chrome tanning	Chalk & Board Power point	Applied chemistry Jayashree Ghosh	Oral test
VI	2	2	Finishing process, fat liquoring and effluent treatment	Chalk & Board Power point	Applied chemis-try Jayashree Ghosh	Oral test

<u>VII</u>	2	3	Classification and composition of fuels	Chalk & board Power point	Industrial Chemistry B.K. Sharma	Written test
<u>VIII</u>	2	3	Cracking, Fischer Tropsch and Bergius processes.	Chalk & Board Power point	Industrial Chemistry B.K. Sharma	Oral test
<u>IX</u>	2	3	Liquid fuel, Natural gas and water gas	Chalk & Board Power point	Industrial Chemistry B.K. Sharma	Written test
<u>X</u>	2	4	Classification of textile fibres	Chalk & Board Power point	Industrial Chemistry B.K. Sharma	Oral test
<u>XI</u>	2	4	Rayon, Nylon and textile chemical processing	Chalk & Board Power point	Industrial Chemistry B.K. Sharma	Assignment
<u>XII</u>	2	4	Classification of pigments and dyes.	Chalk & Board Power point	Industrial Chemistry B.K. Sharma	Written test
<u>XIII</u>	2	5	Raw materials and characteristics of glass.	Chalk & Board Power point	Industrial Chemistry B.K. Sharma	Oral test
<u>XIV</u>	2	5	Refractories and its classification	Chalk & Board Power point	Industrial Chemistry B.K. Sharma	Oral test
<u>XV</u>	2	5	Cement, paints and pigments	Chalk & Board Power point	Industrial Chemistry B.K. Sharma	Assignment

LESSON PLAN

Academic Year : 2021-2022
Class : I M.Sc
Subject : Organic Reactions and Mechanisms
Hours / Week : 3/week
Credits : 4

Semester : II
Class Code : P14
Subject Code : PCCHD20
Total Hours : 45
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	3	1	Oxidation by quinones and Selenium dioxide	Chalk and Board	Reactions, Rearrangements and Reagents S.N. Sanyal	Written Test
II	3	1	Oxidation by OsO_4 , lead tetraacetate, chromic acid and ozone/hydrogen peroxide	Chalk and Board	Reactions, Rearrangements and Reagents S.N. Sanyal	Oral Test
III	3	1	Formation of C-C bond in phenol coupling and acetylenic coupling	Chalk and Board	Organic Reactions Mechanism S.M. Mukerji	Assignment
IV	3	1	Oxidation by potassium permanganate, Pfitzer-Moffatt and Oppenauer oxidation	Chalk and Board	Reactions, Rearrangements and Reagents S.N. Sanyal	Oral Test
V	3	1 & 3	Dakin and Swern oxidation Wagner Meerwein rearrangement	Chalk and Board	Reactions, Rearrangements and Reagents S.N. Sanyal	Oral Test
VI	3	3	Demjanov, Dienone-phenol and Favorski rearrangement	Chalk and Board	Advanced Organic Chemistry Jerry March	Written Test

<u>VII</u>	3	3	Baeyer Villiger, Wolff, Curtius and Von-Richter rearrangement	Chalk and Board	Advanced Organic Chemistry Jerry March	Oral Test
<u>VIII</u>	3	3	Lassen, Schmidt rearrangement, Nitrenes, Methods of generating nitrenes and their reactions	Chalk and Board	Advanced organic chemistry Jerry March	Written Test
<u>IX</u>	3	3/4	Michael addition, Skraup and Hunsdicker reactions	Chalk and Board	Reactions, Rearrangements and Reagents S.N. Sanyal	Assignment
<u>X</u>	3	4	Ullmann, NEF and HVZ reactions	Chalk and Board	Reactions Rearrangements and Reagents S.N. Sanyal	Written Test
<u>XI</u>	3	5	Jablonski diagram, Norrish type I and II reactions	Chalk and Board	Organic Reaction Mechanism S.N. Mukherji	Oral Test
<u>XII</u>	3	5	Paterno-Buchi reaction, Photocycloaddition of α - β unsaturated ketones	Chalk and Board	Organic Reaction Mechanism S.M. Mukherji	Written Test
<u>XIII</u>	3	5	Pericyclic reactions - classification, Woodward Hoffmann rules	Chalk and Board	Organic Reaction Mechanism S.N. Mukherji	Oral Test
<u>XIV</u>	3	5	Electrocyclic reactions and its types, Cope and Claisen rearrangement	Chalk and Board	Organic Reaction Mechanism S.N. Mukherji	Oral Test
<u>XV</u>	3	5	Correlation diagram for butadiene - cyclobutene - cyclohexadiene	Chalk and Board	Organic Reaction Mechanism	Oral

LESSON PLAN

Academic Year : 2021 - 2022
Class : III SBE: Food chemistry
Subject : Food chemistry
Hours / Week : 2/week
Credits : 2

Semester : VI
Class Code : 017
Subject Code : USCHD619
Total Hours : 30
Total Marks : 60

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	2	1	Food adulteration in food grains, milk and butter	Chalk and Board	Food Science B. Srilakshmi	Written test
II	2	1	Food adulteration in ghee, ice creams, cakes and pepper	Chalk and Board	Food Science B. Srilakshmi	Oral test
III	2	1	Food adulteration in turmeric, chilli, edible oils and coffee powder. <small>FSSAI and HACCP laws</small>	Chalk and Board	Food Science B. Srilakshmi	Assignment
IV	2	2	Advantages and disadvantages of Sucralose, saccharin, cyclamate and aspartame	Chalk and Board	Food Science B. Srilakshmi	Oral test
V	2	2	Food flavours and leavening agents	Chalk and Board	Food Science B. Srilakshmi	Written test
VI	2	2	Antioxidants - propyl gallate, butylated hydroxytoluene and butylated hydroxytoluene	Chalk and Board	Food Science B. Srilakshmi	Oral test

<u>VII</u>	2	3	Food poison - pesticides, chemical poisons and first aid for poison consumed victims	Chalk and Board	Food Science B. Sailakshmi	Written test
<u>VIII</u>	2	3	Alcoholic and non alcoholic beverages	Chalk and Board	Food Science B. Sailakshmi	Oral test
<u>IX</u>	2	3	Addiction to alcohol and deaddiction measures.	Chalk and Board	Food Science B. Sailakshmi	Oral test
<u>X</u>	2	4	oils, saturated and unsaturated fats, MUFA and PUFA	Chalk and Board	Food Science B. Sailakshmi	Oral test
<u>XI</u>	2	4	Iodine value, RM value, Rancidity and its types	Chalk and Board	Food Science B. Sailakshmi	Written test
<u>XII</u>	2	4	Test and prevention of rancidity	Chalk and Board	Food Science B. Sailakshmi	Oral test
<u>XIII</u>	2	5	Classification and composition of fruits and vegetables	Chalk and Board	Food Science B. Sailakshmi	Oral test
<u>XIV</u>	2	5	Water soluble and water insoluble pigments	Chalk and Board	Food Science B. Sailakshmi	Written test
<u>XV</u>	2	5	Ripening and storage of fruits	Chalk and Board	Food Science B. Sailakshmi	Oral test

Academic Year : 2021 - 2022
Class : II B.Sc
Subject : Agricultural chemistry
Hours / Week : 2/week
Credits : 2

Semester : IV
Class Code : U17
Subject Code : USCHB420
Total Hours : 30
Total Marks : 60

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
<u>I</u>	2	1	Scope of agriculture in India and Tamil Nadu Branches of Agriculture	Chalk and Board	Principles of Agronomy S. Sankaran	Oral Test
<u>II</u>	2	1	Agronomical classification of crops	Chalk and Board	Principles of Agronomy S. Sankaran	Written Test
<u>III</u>	2	1	Major crops of India and Tamil Nadu Factors affecting crop production	Chalk and Board	Principles of Agronomy	Oral Test
<u>IV</u>	2	2	Soil classification and its properties	Chalk and Board	Fundamentals Concepts of applied chemistry Jayashree Ghosh	Oral Test
<u>V</u>	2	2	Soil temperature, soil colloids, soil minerals and soil pH.	Chalk and Board	Fundamentals Concepts of applied chemistry	Oral Test
<u>VI</u>	2	2	Soil acidity, alkalinity, buffering soil and soil formation	Chalk and Board	Fundamentals concepts of applied chemistry	Oral Test

<u>VII</u>	2	3	Farming, subsistence, mixed plantation, Conventional and Commercial farming	Chalk and Board	Chemistry in Daily life Kirpal Singh	Written test
<u>VIII</u>	2	3	Organic farming - Advantages and disadvantages Poultry and dairy farming	Chalk and Board	Chemistry in Daily Life Kirpal Singh	Oral test
<u>IX</u>	2	3	Certification of organic products - OFAI organic labelling	Chalk and Board	Chemistry in Daily life Kirpal Singh	Oral test
<u>X</u>	2	4	Insecticides, Methods of using pest control	Chalk and Board	Fundamental concepts of applied chemistry Jayashree Ghosh	Written test
<u>XI</u>	2	4	Arsenic, fluorine, boron, mercury, copper and Sulphur containing insecticides	Chalk and Board	Jayashree Ghosh	Written test
<u>XII</u>	2	4	Rodenticides and adverse environmental effects of pesticides	Chalk and Board	Jayashree Ghosh	Oral test
<u>XIII</u>	2	5	Nitrogenous fertilizers	Chalk and Board	Jayashree Ghosh	Oral test
<u>XIV</u>	2	5	Manure, compost and Saw dust	Chalk and Board	Jayashree Ghosh	Oral test
<u>XV</u>	2	5	Sewage, sludge and biogas	Chalk and	Jayashree Ghosh	Oral test

Academic Year : 2021-2022
 Class : B.Sc Chemistry - I Year
 Subject : General Chemistry - I
 Hours / Week : 1
 Credits :

Semester : I
 Class Code : D17
 Subject Code : UCC H1A20
 Total Hours : 15
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	1	I 1.4	Periodicity of Properties - Inclusion of Effective Nuclear Charge Screening constant.	Powerpoint	R.D. Madan - Inorganic Chemistry	Written test
II	1	I 1.4	Factors affecting and Periodicity of atomic radii.	Powerpoint	R.D. Madan - Modern Inorganic Chemistry	Written test
III	1	I 1.4	Factors affecting and Periodicity of Ionic radii.	Powerpoint	R.D. Madan - Modern Inorganic Chemistry	Written test
IV	1	I 1.4	Factors affecting and Periodicity of Ionization Potential	Powerpoint	R.D. Madan - Modern Inorganic Chemistry	Written test
V	1	I 1.4	Factors affecting and Periodicity of Electron affinity.	Powerpoint	R.D. Madan - Modern Inorganic Chemistry	Written test
VI	1	I 1.5	Factors affecting and Periodicity of electronegativity.	Powerpoint & Board	R.D. Madan - Modern Inorganic Chemistry	Written test

VIII	1	I	1.6	Determination of electronegativity Paulings and Mulliken's Scale.	Powerpoint Chalk & Board.	R.D. Madan - Modern Inorganic Chemistry.	Written test.
III	1	III	3.1	IUPAC system of nomenclature of organic compounds - Rules.	Powerpoint Chalk & Board	B.S. Bahl & Anur Bahl - Advanced Organic Chemistry.	Written test.
IX	1	III	3.2	IUPAC system of nomenclature Alkanes, substituted alkenes, alkyl radicals.	Powerpoint Chalk & Board	B.S. Bahl & Anur Bahl - Advanced Organic Chemistry.	Written test.
X	1	III	3.2	IUPAC system of nomenclature Alkenes, Alkynes.	Powerpoint Chalk & Board	B.S. Bahl & Anur Bahl - Advanced Organic Chemistry	Written test
XI	1	III	3.2	IUPAC system of nomenclature Alkyl substituents - Cycloalkanes	Powerpoint Chalk & Board	B.S. Bahl & Anur Bahl Advanced Organic Chemistry	Written test
XII	1	III	3.3	IUPAC system of nomenclature Alcohols, ethers, Aldehydes.	Powerpoint Chalk & Board	B.S. Bahl & Anur Bahl Advanced Organic Chemistry	Written test
XIII	1	III	3.3	IUPAC system of nomenclature ketones, carbonylic acids, esters, diene Compounds.	Powerpoint Chalk & Board	B.S. Bahl & Anur Bahl Advanced Organic Chemistry	Written test
XIV	1	III	3.3	IUPAC system of nomenclature aromatic & substituted aromatic, Polycyclic & heterocyclic compounds.	Powerpoint Chalk & Board	B.S. Bahl & Anur Bahl Advanced Organic Chemistry	Written test
XV	1	III	3.3	IUPAC system of nomenclature	Powerpoint Chalk & Board	B.S. Bahl & Anur Bahl Advanced Organic Chemistry	Written test

Academic Year : 2021-2022
 Class : B.Sc. Chemistry - III year
 Subject : SBE - Small Scale Chemistry
 Hours / Week : 2
 Credits :

Semester : V
 Class Code : USCHC519
 Subject Code : USCHC519
 Total Hours : 30
 Total Marks : 60

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
<u>I</u>	2	1	SSI - objectives, characteristics, Types of SSI, Role of SSI in Indian Economy	Power point Chalk & Board	Dr. V. Balu Entrepreneurship & Small Business Promotion.	Written test
<u>II</u>	2	1	Problems - SSI, steps in starting SSI, Laws for SSI.	Power point Chalk & Board	Dr. V. Balu Entrepreneurship & Small Business Promotion.	Written test
<u>III</u>	2	1	Finance Management, Quality Control, Marketing & Branding, Advertising.	Power point Chalk & Board	Dr. V. Balu Entrepreneurship & Small Business Promotion	Written test
<u>IV</u>	2	2	Soaps, Definition, Types of Soap, Manufacture of Laundry & Bathing Soap.	Power point Chalk & Board	Jl. Panda - Herbal Soaps & Detergents Hand Book.	Written test
<u>V</u>	2	2	Mechanism of cleansing action of Soap. Herbal Soap.	Power point Chalk & Board	Jl. Panda - Herbal Soaps & Detergents Hand Book.	Written test
<u>VI</u>	2	2	Detergents - Manufacture, herbal Shampoo, Anti dandruff & Conditioners.	Power point Chalk & Board	Jl. Panda - Herbal Soaps & Detergents Hand Book.	Written test

<u>VII</u>	2	3	Cosmetics - Definition, History, Kinds of Cosmetics.	B.M. Mittal & Sharma A Hand Book of Cosmetics	Powerpoint Chalk & Board	Written test
<u>VIII</u>	2	3	Preparation of face powder, face cream & lipstick.	B.M. Mittal & Sharma A Hand Book of Cosmetics	Power point Chalk & Board	Written test
<u>IX</u>	2	3	Perfumes - Definition, classification of essential oils & Preparation.	B.M. Mittal & Sharma A Hand Book of Cosmetics	Powerpoint Chalk & Board	Written test
<u>X</u>	2	4	Camphor, Bleaching powder, Biogas - Composition, Production & Uses.	B.k. Sharma Industrial Chemistry.	Powerpoint Chalk & Board	Written test
<u>XI</u>	2	4	Bagasse, Asofoetida - Composition manufacture & Uses.	B.k. Sharma Industrial Chemistry.	Powerpoint Chalk & Board	Written test
<u>XII</u>	2	4	Safety Matches & Agarbattis - Composition & Manufacture.	B.k. Sharma Industrial Chemistry.	Powerpoint Chalk & Board	Written test
<u>XIII</u>	2	5	PET, PVC, HDPE & PS - Recycling & Synthesis	B.k. Sharma Industrial Chemistry.	Powerpoint Chalk & Board	Written test
<u>XIV</u>	2	5	Reverse Osmosis, Coconut Oil - Manufacture & Application	B.k. Sharma Industrial Chemistry.	Powerpoint Chalk & Board	Written test
<u>XV</u>	2	5	Vulcanization of rubber, Plastics -	B.k. Sharma Industrial Chemistry.	Powerpoint Chalk & Board	Written test

<u>VII</u>	3	3	Vitamins - Classification, Fat-soluble Vitamins A, D, E & K.	Powerpoint Chalk & Board	Shrinandan Bansal - Food & Nutrition	Written test
<u>VIII</u>	3	3	Water Soluble Vitamins - Thiamine, Riboflavin, Niacin, Pyridoxine & Pantothenic Acid.	Powerpoint Chalk & Board	Shrinandan Bansal - Food & Nutrition	Written test
<u>IX</u>	3	3	Water Soluble Vitamins - Folate, Choline, Biotin, Ascorbic acid & Cyanocobalamin.	Powerpoint Chalk & Board	Shrinandan Bansal - Food & Nutrition	"
<u>X</u>	3	4	Minerals - Major elements (Ca, P, Na, K, Fe, Mg, I & F).	Powerpoint Chalk & Board	"	"
<u>XI</u>	3	4	Trace elements (Zn, Cu, Co, Se, Mo). Sources, functions, deficiency diseases RDA	Powerpoint Chalk & Board	"	"
<u>XII</u>	3	4	Balanced diet - Diet in Pregnancy & lactation.	Powerpoint Chalk & Board	"	"
<u>XIII</u>	3	5	Vegetables - Classification. Vegetable Cookery.	B. Sri Lakshmi Powerpoint Chalk & Board	B. Sri Lakshmi Power point Chalk & Board	"
<u>XIV</u>	3	5	Fruits - Nutritive Value of fruits, Pigments, pectic Substance.	Powerpoint Chalk & Board	"	"
<u>XV</u>	3	5	Repeinty & Antioxidants 60	Powerpoint Chalk & Board	"	"

<u>VII</u>	2	<u>II</u> 2.1	Mass Spectroscopy - Ionization techniques (ESI, FD, FAB, SIMS, MALDI).	Powerpoint Chalk & Board	H. kaur - Spectroscopy	Written test
<u>VIII</u>	2	<u>II</u> 2.2	molecular ions, isotope ions, metastable peak, Nitrogen & Ring rule, fragmentations	Powerpoint Chalk & Board	H. kaur - Spectroscopy	Written test
<u>IX</u>	2	<u>II</u> 2.3	Rearrangement ions - cleavage patterns	Powerpoint Chalk & Board	H. kaur - Spectroscopy	Written test
<u>X</u>	2	<u>II</u> 2.4	Applications of mass Spectra -	Powerpoint Chalk & Board	1) H. kaur 2) L. D. S. Yadav - Spectroscopy	Written test
<u>XI</u>	2	<u>II</u> 2.5	McLafferty rearrangement - phenols, nitro aldehydes, esters, acetals, ketals, lactams hetero aromatic Compounds.	Powerpoint Chalk & Board	1) H. kaur 2) L. D. S. Yadav - Spectroscopy	Written test
<u>XII</u>	2	<u>II</u> 2.6	Advantages of GC-MS Over MS.	Powerpoint Chalk & Board	H. kaur - Spectroscopy	Written test
<u>XIII</u>	2	<u>III</u> 3.1	NMR Spectroscopy - Larmor frequency, Rotated Proton, chemical shift, Shielding constants Ring current & Aromaticity for ^1H & ^{13}C .	Powerpoint Chalk & Board	1) H. kaur 2) R. M. Silverstein - Spectroscopy	Written test
<u>XIV</u>	2	<u>III</u> 3.2	Spin-spin interaction - Nuclear Overhauser effect (NOE)	Powerpoint Chalk & Board	1) H. kaur 2) R. M. Silverstein - Spectroscopy	Written test
<u>XV</u>	2	<u>III</u> 3.3	Applications of ^1H NMR, ^{13}C NMR, ^{31}P NMR & ^{19}F NMR.	Powerpoint Chalk & Board	1) H. kaur 2) R. M. Silverstein - Spectroscopy	Written test

Auxilium College (Autonomous)

(Accredited by NAAC with A+ Grade with a CGPA of 3.55 out of 4 in the 3rd Cycle)

Gandhi Nagar, Vellore - 632 006.

Phone No. : 0416 - 2241774



Academic Year : 2021 - 2022

FACULTY RECORD

Name : Ms. T. Revathy

Department : Chemistry

LESSON PLAN

Academic Year : 2021-2022
Class : II B.S.C. CHEMISTRY
Subject : UCCHD20 - GENERAL CHEMISTRY - II
Hours / Week : 3
Credits : 5

Semester : III
Class Code : U17
Subject Code : UCCHD20
Total Hours : 45
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	3	2	Alkaline Earth metals - occurrence, comparative study of oxides & halides	powerpoint	Modern Inorganic Chemistry - R.D. Madan	Oral test
II	3	2	comparative study of elements and compounds - hydroxides, sulphates & carbonates	Power point	Modern Inorganic chemistry - R.D. Madan	Oral test
III	3	2	Exceptional properties of Beryllium - Diagonal relationship between Be & Al Extraction of Magnesium	Powerpoint	Modern Inorganic chemistry - R.D. Madan	Class test
IV	3	2	Boron family - comparative study of oxides, hydroxides, halides & hydrides.	Chalk & Talk	Modern Inorganic chemistry - R.D. Madan	class test
V	3	2	Preparation, properties, uses and structures of LiAlH_4 , NaBH_4 & Borazole,	Chalk & Talk	Modern Inorganic chemistry - R.D. Madan	Assignment
VI	3	2	Preparation, properties, uses and structures of Diborane. carbon family - Compounds - hydrides, oxides and halides	Powerpoint	Modern Inorganic chemistry - R.D. Madan	Assignment

VII	3	2	Classification of silicates, chemistry of silicones and their applications	chalk and board	Textbook of Inorganic chemistry - P. L. Soni	Oral test
VIII	3	4	Alcohols - Nomenclature - reactions of alcohols with Na, HX, esterification	chalk and board	Advanced Organic chemistry - Bahl & Arun Bahl	Oral test
IX	3	4	Alcohols - oxidation with alk. KMnO_4 , acidic dichromate, CrHNO_3 & catalytic dehydrogenation	chalk and board	Advanced organic chemistry - Bahl & Arun Bahl	Oral test
X	3	4	Dihydric alcohol - Glycol - preparation, properties and uses.	Chalk and board	Organic chemistry - P. L. Soni	Written class test
XI	3	4	Trihydric alcohol - Glycerol - preparation, properties and uses.	Chalk and board	Advanced organic chemistry - Bahl & Arun Bahl	Assignment
XII	3	4	Ethers - isomerism, preparation by Williamson synthesis	powerpoint presentations	organic chemistry - P. L. Soni	Assignment
XIII	3	4	Reaction of ethers, Epoxides - preparation from alkene	power point presentations	Advanced Organic chemistry - Bahl & Arun Bahl	Written test
XIV	3	4	Ring opening reactions of epoxides	power point presentations	Advanced organic chemistry - Bahl & Arun Bahl	Oral test
XV	3	4	Reactions of epoxides with alcohol, ammonia derivative and LiAlH_4 in ethers	powerpoint presentations	Advanced Organic chemistry - Bahl & Arun Bahl	Oral test

LESSON PLAN

Academic Year : 2021-2022

Class : I M.Sc. CHEMISTRY

Subject : STEREOCHEMISTRY AND CONFORMATIONAL

Hours / Week : 5

Credits : 5

Semester : I

Class Code : P14

Subject Code : PCCHA20

Total Hours : 75

Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	5	1	Chirality, optical activity, projection formula and its interconversions	Powerpoint & Models	Advanced organic stereochemistry - N. Tewari	Concept checking Questions
II	5	1	Nomenclature - R/S, D/L, threo/erythro, syn/anti. Disymmetry of allenes, biphenyls and spiranes.	Whiteboard online	stereochemistry and conformational analysis - kalsi	Assignment
III	5	1	stereospecific and stereoselective reactions, Asymmetric synthesis - Cram's rule, principles of geometrical isomerism - E/Z, cycloalkanes	Powerpoint	stereochemistry-conformational mechanism - P.S. Kalsi	concept checking Question
IV	5	2	conformational analysis of disubstituted cyclohexane, cyclohexene - Allylic 1,2 and 1,3 Strain	Powerpoint & Models	Advanced organic stereochemistry - N. Tewari	oral Quiz
V	5	2	Conformation of cyclohexanone - 2-alkyl and 3-alkyl ketone effect. conformation of 6 membered rings containing hetero atom	Powerpoint & 3D animated structures	stereochemistry of organic compounds - D. Nasipuri	oral quiz
VI	5	2	Conformations of decalin - Quantitative correlation between conformation and reactivity - Curtin-Hammett principle.	Powerpoint & 3D animated structures	stereochemistry of organic compounds - D. Nasipuri	concept checking questions

<u>VII</u>	5	3	S_N2 reaction, S_N1 reaction - kinetics, mechanism and factors influencing it.	stereochemistry models & simulations & ppt	stereochemistry of organic compounds - D. Nasipuri	Assignment
<u>VIII</u>	5	3	Mixed S_N1 & S_N2 reactions - substitution by ambident nucleophile, substitution at allylic, vinylic, benzylic and aryl halides	powerpoint and whiteboard online	stereochemistry of carbon compounds - Ernest L. Eliel	oral quiz
<u>IX</u>	5	3	SET - Types - photoinduced & chemically induced - NQP - acyclic open chain, π systems & aromatic rings, cyclic system, π & σ bond	simulations and powerpoint	stereochemistry - conformation and mechanism - P. S. Kalsi	oral quiz
<u>X</u>	5	4	E_1 , E_2 , E_1CB reaction - kinetics, mechanism and evidences. competition between substitution and elimination.	chalk and board	stereochemistry - conformation and mechanism - Kalsi	Assignment
<u>XI</u>	5	4	stereochemistry of E_2 - syn & anti reaction, orientation of the double bond. Regiochemistry of E_1 , E_2 and E_1CB	chalk and board	stereochemistry of carbon compound - Eliel	Concept checking questions
<u>XII</u>	5	4	Pyrolytic eliminations - acyclic and allylic, molecular rearrangement - Grob's fragmentation, Mechanism allied to E_1 & E_2	chalk and board	stereochemistry - conformation and mechanism - Kalsi	Seminar
<u>XIII</u>	5	5	ORD & CD - terminology - plots curves - application - determination of structure, configuration, conformation and optical activity	simulations, models and powerpoint	stereochemistry of carbon compound - Eliel	oral quiz
<u>XIV</u>	5	5	Rotatory dispersion of ketones - applications, The Axial haloketone rule and the octane rule	chalk and board	stereochemistry of carbon compound - Eliel	oral quiz
<u>XV</u>	5	5	Absolute configuration and ketal formation, stereochemical analysis - polarimetry, chiral GC & HPLC and NMR techniques	chalk and board	stereochemistry of carbon compound - Eliel	oral quiz

LESSON PLAN

Academic Year : 2021-2022
Class : II M.Sc. CHEMISTRY
Subject : MOLECULAR SPECTROSCOPY
Hours / Week : 1
Credits : 3

Semester : III
Class Code : P14
Subject Code : PCCH K20
Total Hours : 15
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	1	5	Rotational spectroscopy; classification of molecules, rigid diatomic molecule	Models, simulations and powerpoint	Fundamentals of Molecular spectroscopy - C.N. Banwell	oral quiz
II	1	5	Energy calculation, selection rule, Intensity of spectral line, effect of isotopic substitution	Powerpoint	Fundamentals of Molecular spectroscopy - Banwell	Problem solving assignment
III	1	5	Non Rigid rotator and significance of D value	Whiteboard online	Fundamentals of Molecular spectroscopy - P.S. Sindhu	oral quiz
IV	1	5	Microwave spectra of polyatomic molecules.	chalk and Board	Fundamentals of molecular spectroscopy - P.S. Sindhu	oral quiz
V	1	5	vibrational spectroscopy; Harmonic oscillator, selection rules.	simulations and Powerpoint	Fundamentals of molecular spectroscopy - C.N. Banwell	Problem solving assignment
VI	1	5	Vibrational energy of diatomic molecules, Zero point energy, Force constant and bond strength	simulations and Powerpoint	Fundamentals of molecular spectroscopy - C.N. Banwell	Problem solving assignment

VII	1	5	Anharmonicity, Morse potential energy diagram, Franck Condon principle.	Chalk and Board	Molecular structure and spectroscopy - G. Anuldas	concept checking questions
VIII	1	5	vibrational spectra of polyatomic molecules.	chalk and Board	Fundamentals of molecular spectroscopy - C.N. Banwell	problems solving assignment
IX	1	5	Vibration-rotation spectroscopy, P, Q, R branches	chalk and Board	Fundamentals of molecular spectroscopy - C.N. Banwell	Oral quiz
X	1	5	Breakdown of Born-Oppenheimer approximation	chalk and Board	Molecular structure and spectroscopy - Anuldas	oral quiz
XI	1	5	Vibration of polyatomic molecules, normal modes of vibration, overtones, hot bands, Fermi resonance	simulation and powerpoint	Fundamentals of molecular spectroscopy - C.N. Banwell	Problem solving assignment
XII	1	5	Raman spectroscopy: Classical and quantum theories of Raman effect	Chalk and board	Fundamentals of molecular spectroscopy - C.N. Banwell	oral quiz
XIII	1	5	Pure Rotational, spectra, selection rules, Stokes and anti-Stokes lines.	chalk and board	Fundamentals of molecular spectroscopy - C.N. Banwell	Oral quiz
XIV	1	5	vibrational Raman spectra, selection rule, Stokes and anti-Stokes line,	Chalk and board	Fundamentals of molecular spectroscopy - C.N. Banwell	concept checking questions
	1	5	vibrational-rotational Raman spectra, selection rules, Stokes and anti-Stokes lines, mutual exclusion principle.	chalk and board	Fundamentals of molecular spectroscopy - C.N. Banwell	oral quiz

LESSON PLAN

Academic Year : 2021-2022
Class : II B.S.C CHEMISTRY
Subject : GENERAL CHEMISTRY-IY
Hours / Week : 2
Credits : 5

Semester : IV
Class Code : UCCE20/UI7
Subject Code : UCCE20
Total Hours : 30
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	2	1	Nitrogen family - preparations, properties and uses of hydrazine	Chalk and board	Modern Inorganic Chemistry - R.D. Madan	Oral Quiz
II	2	1	Structure and properties of oxides of Nitrogen (N_2O , NO , N_2O_5)	Models and Chalk and board	Modern Inorganic Chemistry - R.D. Madan	Written test
III	2	1	Structure and properties of oxyacids and halides of phosphorous (H_3PO_4 , H_3PO_3 , PCl_3 & PCl_5)	Models & Chalk and board	Modern Inorganic Chemistry - R.D. Madan	Written test
IV	2	1	Oxygen family - comparative study of compounds - hydrides, halides, oxides and oxyacids	Chalk and board	Modern Inorganic Chemistry - R.D. Madan	Oral Quiz
V	2	1	Halogens - comparative study of elements and compounds - hydroacids, oxyacids	Chalk and board	Modern Inorganic chemistry - R.D. Madan	Oral Quiz
VI	2	1	Interhalogen compounds, pseudo halogens - comparison of halogens and pseudo halogens	Chalk and board	Modern Inorganic Chemistry - R.D. Madan	Group discussion

LESSON PLAN

Academic Year : 2021-2022
Class : I M.Sc. CHEMISTRY
Subject : ADVANCED COORDINATION CHEMISTRY
Hours / Week : 4
Credits : 4

Semester : II
Class Code : P14
Subject Code : POCHE 20
Total Hours : 60
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	4	1	Thermodynamic and kinetic stability - Relation between K & β , Trend in K value - Irving William series, classification of metals	chalk & board	Concise coordination chemistry - R. Gopalan	oral test
II	4	1	Factors affecting the stability of complexes. Detection of complex formation	Chalk and board	Concise coordination chemistry - R. Gopalan	Group discussion
III	4	1	Determination of stability constant by spectrophotometric, polarographic and potentiometric method	chalk and board	Concise coordination chemistry - R. Gopalan	oral test
IV	4	1	optical rotatory dispersion and circular dichroism, ^{temperature effect} Schiff's base structure and stability - Porphyrin, Corrin, crown ethers and crypts	chalk and board, presentations	Nptel.ac.in (electron transfer in living systems)	written test
V	4	3	Types of absorption spectra - Ligand spectra, ion spectra, CT, LF, R-S coupling Microstates - term symbols for d ⁿ ions	chalk and board	Coordination chemistry - Ajay Kumar	oral test
VI	4	3	Selection rules - Laporte's and spin selection rules, splitting of terms in Oh and Td complexes. Orgel diagrams	chalk and board	Concise coordination chemistry - R. Gopalan	Problems solving skills

VII	4	3	Tanabe - Sugano diagrams - Racah parameters - nephelauletic effect. CT spectra - classification	chalk and board	Coordination Chemistry - Ajay Kumar	Group discussion
VIII	4	3	Magnetic characteristics of complexes - Gouy and Faraday's method - orbital contribution to magnetic moment	presentation	Concise Coordination Chemistry - R. Gopalan	oral test
IX	4	4	Electron transfer rxns: OSM, ISM, factors affecting OSM and ISM	chalk and board	Coordination Chemistry - Ajay Kumar	oral test
X	4	4	OSM vs ISM, 2 electron transfer, non complementary e ⁻ transfer rxn. e ⁻ transfer in cytochromes, rubredoxin, ferredoxin	Chalk and board	Concise Coordination Chemistry - R. Gopalan	Oral test
XI	4	4	Geometrical and optical isomerisation rxns, Ligand substitution in sq. planar complexes factors influencing the reactivity	chalk and board	Concise Coordination Chemistry - R. Gopalan	written test
XII	4	5	Trans effect - Trans effect series - theory cis effect, mechanism of substitution in oct complexes. - Ia & Id	Chalk and board	Concise coordination chemistry - R. Gopalan	written test
XIII	4	5	Hydrolysis reactions - acid and base hydrolysis of 6 coordinated Co(III) ammine complex - mechanisms - evidence	Chalk and board	Inorganic chemistry - Purcell & Kotz	Assignment
XIV	4	5	Replacement of coordinated water - mechanisms - evidences - rates of water replacement - orbital occupation effects	chalk and board	Inorganic chemistry - Purcell & Kotz	oral test
XV	4	5	chemistry of Pt & Co Compounds, Metal complexes in medicinal chemistry, industrial and agricultural processes	chalk and board, presentation	Inorganic Chemistry - Purcell & Kotz	Assignment

Academic Year : 2021-2022
Class : II M.Sc. CHEMISTRY
Subject : SOLID STATE AND NUCLEAR CHEMISTRY
Hours / Week : 3
Credits : 4

Semester : IV
Class Code : PI4
Subject Code : PCCHN20
Total Hours : 45
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	3	1	Structure of solids - Miller planes, Miller indices of hexagonal system, distance between planes	Models and simulations	Solid state chemistry - A.R. west	problem solving questions
II	3	1	Reciprocal lattice - XRD instrumentation & analysis - Structure of perovskite, CdI_2 , NiAs, spinels and inverse spinels	models and simulations	Solid state chemistry - smart and Moore	class test
III	3	1	Diffusion, diffusion coefficient, mechanism, vacancy and interstitial diffusion - Growing single crystal - Different methods	Demonstration	Solid state chemistry - Smart & Moore	practical lab work
IV	3	1	Electronic properties of solids - Hall effect and its applications, pyro, piezo and ferro electricity	Chalk and board	Solid state chemistry - A.R. west	Oral quiz
V	3	2	Magnetic properties of solids - hysteresis loss and loops. Types - dia, para, ferro, anti-ferro, ferri magnetism - ferrites, garnets	Chalk and board	Solid state chemistry - A.R. west	oral quiz
VI	3	2	Solid state electrolyte - β alumina - applications Solid state reactions - formation of spinels, Coprecipitation and sol-gel method	chalk and board	Solid state chemistry - A.R. west	Group discussion

VII	3	3	The quark theory - quarks - classification, mass and charge, quark-quark gluon interaction.	powerpoint presentation	Essentials of Nuclear chemistry - H.J. Arnikar	oral test
VIII	3	3	the magnetic properties of the nucleus - Bohr magneton, Nuclear magneton, the neutron mag. Moment, structure of the nucleus	chalk and board	Essentials of nuclear chemistry - H.J. Arnikar	Oral test
IX	3	3	The net magnetic moments of the nuclei, the spin I, the magnetic moment μ_I , Nordheim rules - liquid drop model derivation	chalk and board	Essentials of Nuclear chemistry - H.J. Arnikar	written test
X	3	3	Fermi-gas model, collective model merits and limitations	chalk and board	Essentials of Nuclear chemistry - H.J. Arnikar	written test
XI	3	3	Nuclear reaction - cross section, Q value, threshold energy and compound nucleus theory	chalk and board	Essentials of Nuclear chemistry - H.J. Arnikar	oral test
XII	3	5	Hot atom chemistry and chemical effect of radioactive decay. Detectors: & accelerators introduction	chalk and board	Nuclear chemistry - U.N. Dash	oral test
XIII	3	5	India's 3 stage nuclear power programme - pressurized heavy water reactor, FBTR and thorium based reactor	powerpoint presentation	Essentials of Nuclear chemistry - H.J. Arnikar	Group discussion
XIV	3	5	Cloud chamber, bubble chamber, GM counter, scintillation and cherenkov counters, linear accelerators, cyclotron and synchrotron	powerpoint presentation	Modern physics - Mungesan	seminar
XV	3	5	Reprocessing of spent fuels: Recovery of U & Pu. Nuclear waste management - low, intermediate & high level waste disposal	powerpoint presentation & simulations	Nuclear chemistry - R.K. Dore, & Manohwar, Madhav	seminar

Academic Year : 2021-22
 Class :
 Subject : GENERAL CHEMISTRY III
 Hours / Week : 2 hrs/week
 Credits :

Semester : III
 Class Code :
 Subject Code : UCC11D20
 Total Hours :
 Total Marks :

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	2	1	Cal of For wt. or Molecular weight. Note concept. Relationship between Molar Mass, Mole & Avogadro No.	Ppt Slides	Chemistry 2e by Paul Flowers, Klaus Theopold, R. Langley.	Verify your Learning Assignments
II	2	1	Solns. - Definition, Properties, Concentr. terms, Molarity, Molality, Normality - Definition, Mathematical Expression & Comparison.	Ppt Slides	Chemistry 2e. 2) Modern Anal. chem. by David Harvey.	Verify your Learning Assignments
III	2	1	Eq. wt. Calculation - for an acid, base, Oxidising agent, reducing agent, salt. Vol. Anal - theory, Titrant, Titrant & Indicator.	Ppt Slides	1) Chemistry 2e. 2) Modern Anal. chem. by David Harvey.	Verify your Learning Assignments
IV	2	1	Preparation of solns. & standardisation of Commercial acids. Primary & second standards - characteristics with examples.	Ppt slides	1) Anal. chem by Usha Rani 2) Mod. Anal. chem David Harvey	class Test
V	2	1	Theory of Acid-base titrations Theory of Acid-base indicators	Ppt slides	1) Anal. chem by Usha Rani 2) Anal. chem. by Gary Christian.	Home Assignments
VI	2	1	Theory of Redox titrations. Theory of Redox indicators.	Ppt slides	1) Anal. chem by Usha Rani 2) Anal. chem by Gary Christian.	Home Assignments

<u>VII</u>	2	1	Theory of complexometric titrations & their indicators.	Ppt slides	1) Anal chem by Usha Parit 2) Anal chem by Gary Christian	Home Assignments
<u>VIII</u>	2	1	Theory of Iodometry, Iodimetry and their indicators.	Ppt slides	Anal chem by Gary Christian	Home Assignments.
<u>IX</u>	2	1	Theory of Precipitation titration and adsorption indicators	Ppt slides	Anal chem by Gary Christian	Take home Assignments.
<u>X</u>	2	1	Types of Errors, Accuracy, Precision & Significant figures.	Ppt slides	Modern Anal. Chem by David Harvey.	Take home Assignments
<u>XI</u>	2	3	Cycloalkanes - Preparation Wurtz-Fittig, Wurtz-Fittig's ring closure & reduction of Δ° hydrocarbon	Ppt slides	Org chem Bahl & Arun Bahl	Class test
<u>XII</u>	2	3	Substitution & ring opening reactions	PPT slides	Org chem Bahl & Arun Bahl	class test
<u>XIII</u>	2	3	Brownian Motion theory, Theory of standard state	PPT slides	Org chem Bahl & Arun Bahl	class test
<u>XIV</u>	2	3	Carboxylic acids - nomenclature & acidity constants	PPT slides.	Org chem Bahl & Arun Bahl	class test
<u>XV</u>	2	3	Acid strength - comparison	PPT slides	Org chem Bahl & Arun Bahl	class test

LESSON PLAN

Academic Year : 2021-22.
Class :
Subject : NME COSMETICS & DYES
Hours / Week : 3 hrs/week.
Credits :

Semester : V
Class Code :
Subject Code : UGCHB519
Total Hours :
Total Marks :

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	3	1.	Cosmetics Definition and classification. History of cosmetics.	Powerpoint slides, Jam Board.	Chemistry in Daily Life Kirpal Singh.	Class test
II	3	1	Components of cosmetics. Deodorants and antiperspirants. Definition & differences.	Powerpoint slides, Jam Board.	Chemistry in Daily Life Kirpal Singh	Class test
III	3	1	Aerosols, Perfumes, Fragrances with Examples. Pros and Cons of Synthetic Cosmetics.	Powerpoint slides & Jam Board.	Chemistry in Daily Life Kirpal Singh.	Class test.
IV	3	2	Basic Concept of Cosmetic Safety, Role of FDA in Cosmetic Safety.	Powerpoint slides, Jam Board.	Handbook of Cosmetic Science & Tech. FDA website.	Test
V	3	2	Safety test items & Evaluation methods.	Ppt slides & Jam Board.	Handbook of Cos. Tech & Scie FDA website.	Test
VI	3	2.	Testing on human - Patch Test & Usage test.	Ppt slides & Jam Board.	Handbook of Cos. Science & Technology	Test.

VII	2	1	DSC - Principle, instrumentation & Applications.	Ppt slides	DIA & DSC Haene et al, Chap. 5.	class test.
VIII	2	1	Thermometric titrations - Principle, instrumentation & Applications.	Ppt slides.	Instru. Methods Chem Anal. A K Sivasubawa	class test.
IX	2	4	Introduction to Computers - History, Hardware, Software & Programming Languages.	Ppt slides.	C Programming by K V Raman	Take home Assignment
X	2	4	C-Programming; Variables, Constants, Operators, input & output functions.	Unix terminal, Jam Board	Programiz - Online tutorial	Take home Assignment
XI	2	4	C-Programming, Control statement, loop	Unix terminal, Jam Board	Programiz - Online tutorial	Take home Assignment
XII	2	4	Go to statement - functions, Arrays.	Unix terminal, Jam Board	Programiz - Online tutorial	Take home Assignment
XIII	2	4	Pointers, Calculation of PH, Solubility product.	Unix terminal, Jam Board	Programiz - Online tutorial	Take home Assignment
XIV	2	4	Calculation of Bond Energy using Born-Landé equation, Intro. to internet services in India WWW, HTTP, IITM, ICPIIP	Unix terminal, Jam Board	Programiz - Online tutorial	Take home Assignment
				"	History	"

Academic Year : 2021-22
 Class : II B.Sc.
 Subject : EVS
 Hours / Week :

LESSON PLAN

LESSON PLAN

Academic Year : 2021-22
 Class : NME (III YEAR)
 Subject : COSMETICS & DYES
 Hours / Week : 3 hrs.
 Credits :

Semester : VI
 Class Code :
 Subject Code : UGCH3619
 Total Hours :
 Total Marks :

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	3	1	Cosmetics: Definition and classification.	Chalk and Board	Chem. in Daily Life Kirpal Singh.	Take home Assignment
II	3	1	Components of cosmetics: Deodorants and Antiperspirants - definition.	Chalk and Board	Chem. in Daily Life Kirpal Singh.	Take home Assignment
III	3	1	Aerosols, Perfumes and fragrances with Examples. Pros & Cons of Synthetic cosmetics	Chalk and Board	Chem. in Daily Life Kirpal Singh.	Take home Assignment
IV	3	2	Basic concept of cosmetics Safety.	Chalk and Board	Handbook of Cosmetic Science Marc Paye.	Take home Assignment
V	3	2	Safety test items and Evaluation methods.	Chalk and Board	Handbook of Cosm. Science. Marc. Paye.	Take home Assignment
VI	3	2	Testing on Human - Patch test and Usage test	Chalk and Board.	Handbook of Cosm. Science. Marc. Paye.	Take home Assignment

<u>VII</u>	2	<u>III</u>	Biodiversity and its value	Chalk and Board.	UGC Syllabus; NBD-Material	Take home Assignment
<u>VIII</u>	2	<u>III</u>	India as a nation of Mega Biodiversity	Chalk and Board.	UGC Syllabus; NBD-Material.	Take home Assignment
<u>IX</u>	2	<u>III</u>	Threats to Biodiversity and its conservation	Chalk and Board.	UGC Syllabus; NBD-Material.	Take home Assignment
<u>X</u>	2	<u>IV</u>	Environmental Pollution-Types	Chalk and Board.	UGC Syllabus	Class Test.
<u>XI</u>	2	<u>IV</u>	Water, air, noise and soil - causes, effects and control	Chalk and Board.	UGC Syllabus	Take home Assignment
<u>XII</u>	2	<u>IV</u>	Rain water harvesting and Solid waste management.	Chalk and Board.	UGC Syllabus.	Take home Assignment
<u>III</u>	2	<u>V</u>	Human Population and Environment, Environmental Pollution act.	Chalk and Board.	UGC Syllabus.	Take home Assignment
<u>IV</u>	2	<u>V</u>	Climate change and afforestation, Sustainable development.	Chalk and Board.	UGC Syllabus	class test.
			Environment Protection	Chalk and Board.	UGC Syllabus	

Academic Year : 2021-22
Class : NME (III YEAR)
Subject : COSMETICS & DYES
Hours / Week : 3 hrs.
Credits :

Semester : VI
Class Code :
Subject Code : UGCH3619
Total Hours :
Total Marks :

LESSON PLAN

Academic Year : 2021-22
 Class : II B.Sc.
 Subject : EVS
 Hours / Week : 2 hours.
 Credits :

Semester : IV
 Class Code :
 Subject Code :
 Total Hours :
 Total Marks :

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	2	I	Multidisciplinary nature of Envir. Studies, scope and importance.	chalks Board.	UGC Syllabus	Take home Assignment
II	2	I	Nat. resources: Uses, over-exploitation of water, land and Energy.	chalk and Board.	UGC Syllabus	Take home Assignment
III	2	I	Natural Resources:- Forest and Mineral Resources	chalk and Board	UGC Syllabus	Take home Assignment
IV	2	II	Ecosystem - Types, structure and Function.	chalk and Board	UGC Syllabus	Take home Assignment
V	2	II	Ecosystem - Forest, Grassland.	chalk & Board	UGC Syllabus	Take home Assignment
VI	2	II	Ecosystem - Desert and Aquatic ecosystem	chalk and Board	UGC Syllabus	class test.

<u>VII</u>	3	3	Herbal cosmetics - fruits & vegetables as hair care & skin care.	Chalk and Board.	Herbal Principles by Roland Hardman	Take home Assignment
<u>VIII</u>	3	3	Perfumes and fragrances, skin care herbs - olive, amla, Aromatherapy - intro.	Chalk and Board	Herbal Princip. by Roland Hardman	Take home Assignment
<u>IX</u>	3	3	Oils used in Aromatherapy - Standardisation of Herbal Extracts.	Chalk and Board.	Herbal primer by Roland Hardman	Take home Assignment
<u>X</u>	3	4	Dyes - Definition of dyes, requirements of a good dye.	Chalk and Board.	Applied chem by Jayashree Ghosh.	Take home Assignment
<u>XI</u>	3	4	Natural and Synthetic Dyes - definition & limitations	Chalk and Board.	Applied chem by Jayashree Ghosh.	Take home Assignment
<u>XII</u>	3	4	Synthetic dyes - definition, Primaries and intermediates.	Chalk and Board	Applied chem by Jayashree Ghosh.	Take home Assignment
<u>XIII</u>	3	5	Textile uses of dyes - impact of the textiles and leather dye industry	Chalk and Board	Fundamental Concepts of Env. Chem. Sodhi	Take home Assignment
<u>XIV</u>	3	5	Biomedical Uses - Tablets, Symps and capsules, DNA Markers, Food and Cosmetics	Chalk and Board.	Fun. concept Env. Chem. Sodhi.	Take home Assigned

Academic Year : 2021-22
 Class : I M Sc.
 Subject : PHARMACEUTICAL CHEM.
 Hours / Week : 2 hrs.
 Credits :

Semester : II
 Class Code :
 Subject Code : PECHC20
 Total Hours :
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	2	3	Drug discovery - introd. discovery of Penicillin	Chalk and Board	Med chem by Ahuwalia	class test
II	2	3	Discovery of Lead Compounds.	chalk and Board	Med chem by Ahuwalia	class test
III	2	3	Lead modification - Modification of functional groups, SAR	chalk and Board	Med chem by Ahuwalia	class test
IV	2	3	QSAR - Hammett Eqn, Taft Equation.	chalk and Board	Med chem by Ahuwalia	class test
V	2	3	3D plot, Drug Design using QSAR.	chalk and board	Med chem by Ahuwalia	class test.
VI	2	3	Computer Aided drug design (CADD).	chalk and Board.	Med. chem by Ahuwalia	class test

LESSON PLAN

Academic Year : 2021 - 2022
 Class : B.Sc Chemistry - III year
 Subject : Analytical Chemistry
 Hours / Week : 5
 Credits : 4

Semester : V
 Class Code : U17
 Subject Code : UECNA116
 Total Hours : 75
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	5	I	Principle of gravimetric analysis - Characteristic and choice of precipitants - Specific and selective precipitants - Co-precipitation - Post precipitation.	Powerpoint	Elements of Analytical Chemistry R. Goralan	Quiz, Written test
II	5	I	Data analysis - Types of errors - Standard deviation.	Powerpoint	Instrumental Analysis Skogg, Holler and Crouch	Quiz, Written test
III	5	I	Chromatography: Paper chromatography - Principle, technique and applications	Powerpoint	Instrumental methods of chemical Analysis B.K. Sharma	Quiz, Written test
IV	5	II	Column chromatography: Principle, technique and applications	Powerpoint	Instrumental methods of chemical Analysis B.K. Sharma	Quiz, Written test
V	5	II	TLC: Principle, technique and applications. Principles of GC & HPLC	Powerpoint	Instrumental methods of chemical Analysis B.K. Sharma.	Quiz, Written test
VI	5	II				

VII	5	III	UV-Visible Spectroscopy: Absorption laws - Calculations involving Beer-Lambert's law.	Powerpoint	Elementary Organic Spectroscopy Y. R. Sharma.	Assignment, Written test
VIII	5	III	Instrumentation - Block diagrams with description of components.	Powerpoint	Analytical Chemistry Usharani	Assignment, Written test
IX	5	III	Types of electronic transitions - Factors affecting absorption maximum.	Powerpoint and Chalk & Board	Analytical Chemistry Usharani	Assignment, Written test
			IR Spectroscopy: Types of vibrations Vibrational frequencies of CO ₂ & H ₂ O.	Powerpoint and Chalk & Board	Elementary Organic Spectroscopy Y. R. Sharma	Assignment, Written test
X	5	IV	Instrumentation of IR Spectroscopy.	Powerpoint and Chalk & Board.	Elementary Organic Spectroscopy Y. R. Sharma	Assignment, Written test
XI	5	IV	Identification of simple organic molecule.	Powerpoint and Chalk & Board	Instrumental methods of chemical analysis B.K. Sharma	Assignment, Written test
XII	5	IV	NMR Spectroscopy: Principle and Instrumentation, Chemical Shift	Powerpoint and Chalk & Board	Elementary Organic Spectroscopy Y. R. Sharma	Assignment, Written test
XIII	5	IV	NMR Spectrum of simple compound.	Powerpoint and Chalk & Board.	Elements of Analytical Chemistry R. Gopalan	Assignment Written test
XIV	5	V	Mass Spectrometry: Principle	Powerpoint and Chalk & Board.	Analytical Chemistry Usharani	Assignment Written test
XV	5	V		Powerpoint and Chalk & Board.		

LESSON PLAN

Academic Year : 2021-2022
 Class : M.Sc. Chemistry - II year
 Subject : Analytical Chemistry
 Hours / Week : 2
 Credits : 4

Semester : III
 Class Code : U17
 Subject Code : PECH220
 Total Hours : 75
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	3	II 2.1	Gas chromatography: Principle and Instrumentation.	Powerpoint	Instrumental analysis Skrey, Holler and Grech	Assignment, Quizz
II	3	II 2.2 2.3	Applications of GC. Principle and Instrumentation of HPLC	Chalk & Board	Instrumental methods of chemical analysis B.K. Sharma	Written test
III	3	II 2.4	Applications of HPLC. Comparison of HPLC and GC	Chalk & Board	Instrumental Methods of chemical Analysis B.K. Sharma	Written test
IV	3	II 2.5	Principle, Properties and Instrumentation of Supercritical Fluid Chromatography.	Powerpoint	Instrumental Analysis Skrey, Holler, Gruch	Quizz, Written test
V	3	II 2.6	Supercritical fluid extraction and its applications.	Chalk & Board	Instrumental methods of chemical Analysis B.K. Sharma	Assignment, Quizz.
VI	3	III 3.1 3.2	Atomic absorption Spectroscopy: Principle and Instrumentation.	Chalk & Board	Instrumental Methods of chemical Analysis B.K. Sharma	Assignment, Written test

VII	3	III	Influences: Spectral and non-spectral interferences.	Powerpoint	Instrumental Analysis Sreeg, Heller, Crouch	Assignment, Written test
VIII	3	III 34	Difference between AAS and AES.	Powerpoint	Instrumental Analysis Sreeg, Heller, Crouch	Written test Quiz.
IX	3	III 35	Advantages of AAS and applications of Atomic absorption Spectroscopy.	Powerpoint	Instrumental Analysis Sreeg, Heller, Crouch	Written test
X	3	IV 36	Photo acoustic Spectroscopy: Principle, Instrumentation and applications.	Chall & Board	Instrumental methods of chemical analysis B.K. Sharma	Assignment, Written test
XI	3	IV 5.1	Environmental Chemistry: BOD, COD, TDS, TS, TSS	Chall & Board	Environmental Chemistry S.S. Dara	Quiz, Written test
XII	3	IV 5.2 5.3	Wastewater Treatment and Reverse Osmosis.	Powerpoint	Wastewater Treatment P. Chemsinsinott	Seminar Written test
XIII	3	IV 54	Toxicity of Hg, Pb, Cd and As.	Chall & Board	Wastewater Treatment P. Chemsinsinott	Assignment, Written test
XIV	3	I 55	Principles of Green chemistry	Powerpoint	Chemistry for Green Environment M.M. Sivakavina	Quiz, Written test
XV	3	I 56	Carbon - Oxygen bond formation: <small>ANVA</small> <small>condensation</small>	Powerpoint	Green Environment M.M. Sivakavina	Quiz, Written test

LESSON PLAN

Academic Year : 2021-2022
 Class : B.Sc Zoology - I year
 Subject : Allied Chemistry
 Hours / Week : UACWA 20 1
 Credits : 4

Semester : I
 Class Code : 01F
 Subject Code : UACWA20
 Total Hours : 60
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	1	I 1.1	Aromatic Compounds - Aromaticity Huckel's Rule.	PowerPoint	Advanced Organic Chemistry Arun Bahl & Bahl	Assignment
II	1	I 1.2	Application of Huckel's rule for benzeneid : Benzene, Naphthalene	PowerPoint	Advanced Organic Chemistry Bahl & Arun Bahl	Assignment
III	1	I 1.2	Application of Huckel's rule for benzeneid : Anthracene, Quinoline	PowerPoint	Advanced Organic Chemistry Bahl & Arun Bahl	Assignment
IV	1	I 1.2	Application of Huckel's rule for non-benzeneid : Azulene, Furanone	PowerPoint	Advanced Organic Chemistry Bahl & Arun Bahl	Assignment
V	1	I 1.3	Preparation, Properties and uses of naphthalene.	PowerPoint	Advanced Organic Chemistry Bahl & Arun Bahl	Written test
VI	1	III 3-1	Polymer Chemistry : Classification of Polymers.	Chalk & Board	Polymer Chemistry G.S. Nisra	Written test

VII	1	III	2.2	Natural sulfoxone with examples	Chalk & Board	Polymer Chemistry G.S. Misra	Quizz
VIII	1	III	3.2	Synthetic sulfoxone with examples	Chalk & Board	Polymer Chemistry G.S. Misra	Written test
IX	1	III	3.3	Preparation and uses of nylon 6,6	PowerPoint	Polymer Chemistry G.S. Misra	Written test
X	1	III	3.3	Preparation and uses of terylene	Chalk & Board	Polymer Chemistry G.S. Misra	Written test
XI	1	II	5.1	Fuel gases: Natural & water gas.	PowerPoint	Test Book of Pharmaceutical Chemistry - Jayashree	Quizz
XII	1	II	5.1	Fuel gases: Semi water & carbonated water gas.	Chalk & Board	Pharmaceutical Chemistry Jayashree Ghosh	Quizz
XIII	1	I	5.1	Fuel gases: Oil gas & Producer gas.	Chalk & Board	Pharmaceutical Chemistry Jayashree Ghosh	Assignment
XIV	1	I	5.2	Types of glasses.	PowerPoint	Pharmaceutical Chemistry Jayashree Ghosh	Quizz

LESSON PLAN

Academic Year : 2021-2022
 Class : BSc Chemistry - III year
 Subject : Pharmaceutical Chemistry
 Hours / Week :
 Credits :

Semester : VI
 Class Code : UFT
 Subject Code : UECHE 19
 Total Hours : 75
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	5	I	Definition & Ions of Pharmaceutical Chemistry. Causes, Symptoms and drugs for anaemia, Jaundice and Cholelithiasis.	Chalk & Board	Pharmaceutical Chemistry Jayashree Ghosh	Written Test
II	5	I	Causes, Symptoms and drugs for malaria, Filaria, dengue fever, Chikungunya. Diagnostic Test for Syphilis, salt and cholesterol.	Chalk & Board	Applied Chemistry Jayashree Ghosh	Written Test
III	5	I	Indian Medicinal plants : Neem, Rose, Keerghandi, Mango, Adathoda, Hibiscus Indica and Ficus.	Power point Presentation	Pharmaceutical Chemistry Jayashree Ghosh	Assignment
IV	5	II	Synthesis and Therapeutic uses of Sulphonamides, Penicillin, Sulpha Thiogole and Sulpha furazole.	Chalk & Board	Pharmaceutical Chemistry Jayashree Ghosh	Written Test
V	5	II	Antibiotics : SAR of Penicillin and Streptomycin.	Chalk & Board	Applied Chemistry Jayashree Ghosh.	Query
VI	5	II	Antibiotics : SAR of Chloramphenicol and Tetracyclines. Antiseptics and Disinfectants.	Chalk & Board	Pharmaceutical Chemistry Jayashree Ghosh	Written Test

<u>VII</u>	5	III	Analgesics and Antipyretics: Morphine, Paracetamol and Ibuprofen	Chalk & Board	Pharmaceutical Chemistry Jayashree Ghosh	Written Test
<u>VIII</u>	5	III	Anaesthetics: Ether, chloroform and thioental sodium, Propomid.	Chalk & Board	Pharmaceutical Chemistry Lakshmi	Written Test
<u>IX</u>	5	III	Toxicology of drugs: Principle dose/ effect [LD, ED]	Chalk & Board	Pharmaceutical Chemistry Jayashree Ghosh	Quiz
<u>X</u>	5	IV	Definition, causes, symptoms and treatment of cancer	Powerpoint Presentation	Pharmaceutical Chemistry Lakshmi	Assignment
<u>XI</u>	5	IV	AIIS and Oral hypoglycemic agents	Chalk & Board	Applied Chemistry Jayashree Ghosh	Written Test
<u>XII</u>	5	IV	Anticonvulsant agent, Blood grouping and Blood Pressure.	Power Point Presentation	Pharmaceutical Chemistry Jayashree Ghosh.	Assignment
<u>XIII</u>	5	V	Cardiovascular drugs: Quinidine Anti hypertensive agents: Aldomet & Reserpine	Chalk & Board	Pharmaceutical Chemistry Lakshmi	Written Test
<u>XIV</u>	5	V	Anti anginal agents: Nitrites Vaso dilator: Tolazoline, Papaverine.	Chalk & Board	Applied Chemistry Jayashree Ghosh	Quiz
<u>XV</u>	5	V	Organic Pharmaceutical acids: Colouring Preservatives, sweetening	Chalk & Board	Applied Chemistry Jayashree Ghosh	Assignment

LESSON PLAN

Academic Year : 2021-2022
Class : M.Sc. Chemistry - I year
Subject : Pharmaceutical Chemistry
Hours / Week : 2
Credits :

Semester : II
Class Code : P14
Subject Code : PECHM 20
Total Hours : 75
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	2	I	1.1 Classification of drugs: Biological, Chemical, Commercial and lay Public.	Chalk & Board	Pharmaceutical Chemistry Jayashree Ghosh	Written test
II	2	I	1.2 Mechanism of drug action: Receptor binding, Biological responses, Bond formation	Chalk & Board	Pharmaceutical Chemistry Jayashree Ghosh	Written test
III	2	I	1.3 Metabolism of drugs: Phase I and Phase II reactions.	Chalk & Board	Medicinal Chemistry Ahluwalia	Written test
IV	2	I	1.4 Routes of administration of drugs.	Chalk & Board	Medicinal Chemistry Ahluwalia	Written test
V	2	I	1.5 Absorption of drugs: Factors affecting absorption.	Chalk & Board	Pharmaceutical Chemistry Jayashree Ghosh	Written test
VI	2	I	1.6 Digestion and absorption of Proteins and fats.	Chalk & Board	Pharmaceutical Chemistry Lakshmi	Written test

LESSON PLAN

Academic Year : 2021 - 2022
Class : M. Sc Chemistry - II Year
Subject : Natural Products and Bio-organic Chemistry
Hours / Week : 1
Credits :

Semester : IV
Class Code : P14
Subject Code : PCCHM 20
Total Hours : 75
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	1	V	Introduction of enzyme chemistry	Chalk & Board	Text book of Biochemistry Sathyanarayana	Written Test
II	1	V	Terminology: Reactive site, catalytic activity and its mechanism.	Chalk & Board	Enzymes Chemistry Hermann Dugas	Assignment
III	1	V	Enzymatic mechanism of alpha chymotrypsin.	Chalk & Board	Enzymes Chemistry Hermann Dugas	Written Test
IV	1	V	Immobilised enzyme chemistry	Chalk & Board	Bio-organic, inorganic Chemistry P.S. Kalsi	Assignment
V	1	V	Enzymes in synthetic organic chemistry	Chalk & Board	Bio-organic - inorganic Chemistry P.S. Kalsi	Written test
VI	1	V	Enzymes in synthetic organic chemistry	Chalk & Board	Bio-organic, inorganic Chemistry P.S. Kalsi	Written test

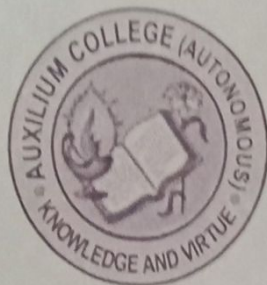
VII	1	V	Enzymes in synthetic organic chemistry.	Organic	Chalk Sp Board	Text book of Bio-organic Chemistry K.S. Kalasi	Assignment
VIII	1	V	Structure, biological and mechanism of coenzymes A, mechanism of TPP.	Organic	Chalk Sp Board	Text book of Biochemistry Sallygenoyana	Assignment
XII	1	V	Structure, biological and mechanism of TPP.	Organic	Chalk Sp Board	Enzymes Chemistry Hermann Eugaro	Assignment
IX	1	V	Structure, biological and mechanism of PLP.	Organic	Chalk Sp Board	Bio-organic, inorganic Chemistry K.S. Kalasi	Written test
XI	1	V	Structure, biological function of NAD ⁺	Organic	Chalk Sp Board	Text book of Biochemistry Sallygenoyana	Written test
XII	1	V	Structure and biological function of NADP	Organic	Chalk Sp Board	Enzymes Chemistry Hermann Eugaro	Written test
XIII	1	V	Structure and biological function of FAD	Organic	Chalk Sp Board	Text book of Biochemistry K.S. Kalasi	Written test
XIV	1	V	Structure and biological function of Lipic acid	Organic	Chalk Sp Board.	Enzyme Chemistry Hermann Eugaro.	Written Test
XV	1	V	Structure and biological function of Vitamin B ₁₂	Organic	Chalk Sp Board	Enzyme Chemistry Hermann Eugaro	Assignment

Auxilium College (Autonomous)

(Accredited by NAAC with A⁺ Grade with a CGPA of 3.55 out of 4 in the 3rd Cycle)

Gandhi Nagar, Vellore - 632 006.

Phone No. : 0416 - 2241774



Academic Year : 2021 - 2022

FACULTY RECORD

Name : Ms. Nithya . S

Department : Chemistry

LESSON PLAN

Academic Year : 2021-2022
 Class : I. B.Sc. Biochemistry & II. B.Sc. physics
 Subject : Allied Chemistry
 Hours / Week : 4
 Credits : 4

Semester : I and III
 Class Code :
 Subject Code : VACHA20 & VACHA320
 Total Hours : 60
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
1	4	<u>I</u>	1.1 Aromatic Compounds - Aromaticity Huckel's Rule. 1.2. Application of Huckel's Rule	power point presentation	Organic Chemistry by BS Bahl and Arun Bahl	Assignment
2	4	<u>I</u>	1.3 preparation, properties and uses of naphthalene. 1.4 Heterocyclic compound	power point presentation	Organic Chemistry by BS Bahl and Arun Bahl	Test
3	4	<u>I</u>	1.5 Electrophilic substitution in Benzene mechanism 1.6 Nitration, Halogenation, acylation	power point presentation	Organic Chemistry by BS Bahl and Arun Bahl	Assignment & Test
4	4	<u>II</u>	2.1 Chemical kinetics - Rate of the reaction. 2.2 Factors affecting rate of the rxn.	power point presentation & Lecture method	physical Chemistry by BR Puri & LR Sharma	Test
5	4	<u>II</u>	2.3 Molecularity and order of the reaction 2.4 Derivation of rate constant of 1st order reaction	power point presentation	physical Chemistry by BR Puri & LR Sharma	Quiz
6	4	<u>II</u>	2.5 Arrhenius Theory 2.6 Collision Theory - Bimolecular rxn.	power point presentation	physical Chemistry by BR Puri & LR Sharma	Assignment & Test

LESSON PLAN

Academic Year : 2021 - 2022
Class : I BBA / I. B. com / I. B. com (B.S.I) / I. B. Sc.
Subject : SBE : Agricultural chemistry
Hours / Week : 2
Credits : 2

Semester : I and II
Class Code :
Subject Code : USCHA120 and USCHA220
Total Hours : 30
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
1	2	I	1.1 Scope of agriculture in India and Tamil Nadu 1.2 Branches of agriculture	power point presentation	principle of agronomy by Sankaran and Subash	Test
2	2	I	1.3 Arts and science business of crop production 1.4 Agronomical classification of crops	power point presentation	principle of agronomy by Sankaran and Subash	Assignment
3	2	I	1.5 Major crops of India and Tamil Nadu 1.6 Factors affecting crop production.	power point presentation	principle of agronomy by Sankaran and Subash	Test
4	2	II	2.1 Soil classification and survey 2.2 Soil texture and soil water	power point presentation	Applied chemistry by Jayashree bhash	Test
5	2	II	2.3 Soil temperature and soil colloids 2.4 Soil minerals and soil pH.	power point presentation	Applied chemistry by Jayashree bhash	Assignment
6	2	II	2.5 Soil acidity, alkalinity and buffering 2.6 Soil fertility and soil formation.	power point presentation	Applied Chemistry by Jayashree bhash	Quiz

7	2	<u>III</u>	3.1 Farming - subsistence farming 3.2 plantation farming, mixed farming	Lecture method	principle of agronomy by Sankaran and Subash	Assignment
8	2	<u>III</u>	3.3 organic farming, dairy farming 3.4 Advantage of organic farming	Lecture method	principles of agronomy by Sankaran and Subash	Test
9	2	<u>III</u>	3.5 Certification of organic products 3.6 Research findings on organic food.	Lecture method	principles of agronomy by Sankaran and Subash	Quiz
10	2	<u>IV</u>	4.1 Insecticides, Fungicides and herbicides 4.2 Method of using pest control	Lecture method	Applied Chemistry by Jayashree Ghosh	Test
11	2	<u>IV</u>	4.3 Insecticides - Arsenic, fluorine and boron 4.4 Mercury, copper and sulphur compound	Lecture method	Applied Chemistry by Jayashree Ghosh	Assignment
12	2	<u>IV</u>	4.5 Modern insecticides 4.6 Benefits of pesticides.	Lecture method	Applied Chemistry by Jayashree Ghosh	Assignment
13	2	<u>V</u>	5.1 Fertilizer - classification - Examples 5.2 Nitrogenous fertilizers	Lecture method	Applied Chemistry by Jayashree Ghosh	Quiz
14	2	<u>V</u>	5.3 Ill effect of fertilizer 5.4 Manures, compost and saw dust	Lecture method	Applied Chemistry by Jayashree Ghosh	Test
15	2	<u>V</u>	5.5 Farmyard manure 5.6 Sewage and sludge	Lecture method	Applied Chemistry by Jayashree Ghosh	Test

LESSON PLAN

Academic Year : 2021 - 2022
 Class : II B.Sc / III B.Com / IV BBA
 Subject : NME: Food and Nutrition Chemistry
 Hours / Week : 3
 Credits : 2

Semester : V and VI
 Class Code :
 Subject Code : U6CHA519 and U6CHA517
 Total Hours : 45
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
1	3	<u>I</u>	1.1 Nutrition and health concept 1.2 Classification of food	power point presentation	Food and Nutrition by Srinandhan bansal	Test
2	3	<u>I</u>	1.3 Nutrients - Macro and Micro nutrients 1.4 Carbohydrate - source and classification	power point presentation	Food and Nutrition by Srinandhan bansal	Test
3	3	<u>I</u>	1.5 Blood sugar level 1.6 Carbohydrate metabolism	power point presentation	Food and Nutrition by Srinandhan bansal	Assignment
4	3	<u>II</u>	2.1 proteins - Source, classification and functions 2.2 Deficiency diseases, energy requirement	power point presentation	Food and Nutrition by Srinandhan bansal	Quiz
5	3	<u>II</u>	2.3 protein- metabolism 2.4 Fats- source, classification, function	power point presentation	Food and Nutrition by Srinandhan bansal	Test
6	3	<u>IV</u>	2.5 Deficiency diseases, energy requirement 2.6 Fat metabolism	power point presentation	Food and Nutrition by Srinandhan bansal	Test

7	3	<u>III</u>	3.1 Vitamins - classification, difference 3.2 Fat soluble vitamins (A and D)	power point presentation & Lecture method	Food and Nutrition by Sri nandhan Bansal	Assignment
8	3	<u>III</u>	3.3 Fat soluble vitamins (E and K) 3.4 Water soluble vitamins - Thiamine	power point presentation & Lecture method	Food and Nutrition by Sri nandhan Bansal	Quiz
9	3	<u>III</u>	3.5 Water soluble vitamins - Folate 3.6 Ascorbic acid - sources, functions.	Lecture method	Food and Nutrition by Sri nandhan Bansal	Test
10	3	<u>IV</u>	4.1 Minerals classification 4.2 Major elements (Ca, P, Na, K)	Lecture method	Food and Nutrition by Sri nandhan Bansal	Test
11	3	<u>IV</u>	4.3 Major elements (Fe, Mg, I and F) 4.4 Trace elements (Zn, Cu, Co, Se, Mo)	Lecture method	Food and Nutrition by Sri nandhan Bansal	Assignment
12	3	<u>IV</u>	4.5 Balanced diet 4.6 Diet in pregnancy and lactation	Lecture method	Food and Nutrition by Sri nandhan Bansal	Test
13	3	<u>V</u>	5.1 Vegetables - Nutritive value 5.2 Vegetable cookery	Lecture method	Food science by Sri lakshmi	Quiz
14	3	<u>V</u>	5.3 Fruits - Nutritive value 5.4 Ripening of fruits	Lecture method	Food science by Sri lakshmi	Assignment
15	3	<u>V</u>	5.5 Storage of fruits 5.6 Antioxidants	Lecture method	Food science by Sri lakshmi	Quiz

Academic Year : 2021-2022
 Class : I.B.Sc. Biochemistry & II.B.Sc. physics
 Subject : Allied chemistry
 Hours / Week : 4+4
 Credits : 4+4

Semester : II and IV
 Class Code :
 Subject Code : UACHB20 & UACHB420
 Total Hours : 60+60
 Total Marks : 100+100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
1	4	I	1.1 Co-ordination chemistry - definition of the terms - ligands, chelate, Chelation 1.2 Nomenclature of mononuclear complexes	Lecture method	Allied chemistry by Veeriyayan and Vasudevan	Assignment
2	4	I	1.3 Werner's theory and Pauling's theory Sidwick's Theory 1.4 Effective atomic number rule	Lecture method	Allied chemistry by Veeriyayan and Vasudevan	Assignment
3	4	I	1.5 Chemistry of EDTA 1.6 Chemistry of haemoglobin and Chlorophyll	Lecture method	Allied chemistry by Veeriyayan and Vasudevan	Test
4	4	II	2.1 Isomerism - types of isomerism. 2.2 Stereo isomerism - optical isomerism - Cause of optical activity.	Lecture method	Allied chemistry by Veeriyayan and Vasudevan	Assignment
5	4	II	2.3 optical isomerism of lactic acid and tartaric acid - R-S Notation 2.4 Racemisation and resolution	Lecture method	Allied chemistry by Veeriyayan and Vasudevan	Test
6	4	III	2.5 Geometrical isomerism of maleic and fumaric acids E-Z notation 2.6 Tautomerism keto enol tautomerism	Lecture method	Allied chemistry by Veeriyayan and Vasudevan	Test

7	4	<u>ii</u>	3.1 Ionic equilibria - strong and weak electrolytes, common ion effect. 3.2 Definition of pH, pKa, pK _b and pK _w	Lecture method	Allied Chemistry by Veerajagan and Vasudevan	Assignment
8	4	<u>iii</u>	3.3 Electrochemical cells - construction definition of emf, standard electrode potential 3.4 Types of cells - primary & secondary	Lecture method	Text book of Physical Chemistry by puri & sharma	Assignment
9	4	<u>iii</u>	3.5 principle of standard hydrogen electrode and calomel electrode. 3.6 principle of Electrophoresis, electro dialysis	Lecture method	Text book of physical chemistry by puri & sharma	Test
10	4	<u>iv</u>	4.1 photochemistry - Laws of light absorption - Lambert's law and Beer's law 4.2 Grotthuss - Draper's law and Stark law	Lecture method	Text book of physical chemistry by puri & sharma	Assignment
11	4	<u>iv</u>	4.3 Quantum yield (Definition) 4.4 photochemical reactions, kinetics of hydrogen and chlorine reaction	Lecture method	Allied Chemistry by Veerajagan and Vasudevan	Test
12	4	<u>iv</u>	4.5 Jablonski diagram 4.6 Fluorescence, phosphorescence, photosensitization and chemiluminescence	Lecture method	Allied Chemistry by Veerajagan and Vasudevan	Test
13	4	<u>v</u>	5.1 Medicinal Chemistry - definition and one example for analgesics - antipyretics etc 5.2 Local anesthetics and general anesthetics	Lecture method	Applied Chemistry by Jayashree gosh	Assignment
14	4	<u>v</u>	5.3 Antibiotics - penicillin, Streptomycin Chloramphenicol 5.4 Causes and treatment of Diabetes.	Lecture method	Applied Chemistry by Jayashree gosh	Test
15	4	<u>v</u>	5.5 Cause and treatment of Cancer 5.6 Cause and treatment of AIDS	Lecture method	Applied Chemistry by Jayashree gosh	Test

LESSON PLAN

Academic Year : 2021 - 2022
 Class : J.B.Sc./I.B.Sc./I.BBA/I.BCA
 Subject : SBE: Agricultural Chemistry
 Hours / Week : 2
 Credits : 2

Semester : II
 Class Code :
 Subject Code : USCHA220
 Total Hours : 30
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
1	2	<u>I</u>	1.1 Scope of agriculture in India and Tamilnadu 1.2 Branches of agriculture	Lecture method	Principles of agronomy by Sankaran and Subhash	Assignment
2	2	<u>I</u>	1.3 Arts and science business of crop production 1.4 Agronomical classification of crops	Lecture method	Principle of agronomy by Sankaran and Subash	Test
3	2	<u>I</u>	1.5 Major crops of India and Tamilnadu. 1.6 Factors affecting crop production	Lecture method	Principle of agronomy by Sankaran and Subhash	Test
4	2	<u>II</u>	2.1 Soil classification and survey 2.2 Soil texture and soil water	Lecture method	Applied Chemistry by Jayashree goash	Assignment
5	2	<u>II</u>	2.3 Soil temperature and soil colloids 2.4 Soil minerals and soil pH.	Lecture method	Applied chemistry by Jayashree goash	Test
6	2	<u>II</u>	2.5 Soil acidity, alkalinity and buffering. 2.6 Soil fertility and soil formation.	Lecture method	Applied chemistry by Jayashree goash	Test

7	2	III	3.1 Farming - subsistence farming 3.2 plantation farming, mixed farming	Lecture method	principle of agronomy by Bankaran and Subash	Assignment
8	2	III	3.3 organic farming and dairy farming 3.4 Advantage of organic farming	Lecture method	principle of agronomy by Bankaran and Subash	Test
9	2	III	3.5 Certification of organic products 3.6 Research findings on organic food	Lecture method	principle of agronomy by Bankaran and Subash	Test
10	2	III	4.1 Insecticides, Fungicide and herbicide 4.2 Method of using pest control	Lecture method	Applied chemistry by Jayashree goash	Assignment
11	2	IV	4.3 Insecticides - Arsenic, Fluorine and boron 4.4 Mercury, Copper and Sulphur compound	Lecture method	Applied chemistry by Jayashree goash	Test
12	2	III	4.5 Modern insecticides 4.6 Benefits of pesticides.	Lecture method	Applied chemistry by Jayashree goash	Test
13	2	V	5.1 Fertilizer - Classification - examples 5.2 Nitrogenous fertilizers	Lecture method	Applied chemistry by Jayashree goash	Assignment
14	2	V	5.3 All kinds of fertilizer 5.4 Manure, Compost and saw dust	Lecture method	Applied chemistry by Jayashree goash	Test
15	2	V	5.5 Farmyard manure 5.6 Sewage and Sludge	Lecture method	Applied chemistry by Jayashree goash	Test

Academic Year : 2021-2022
 Class : B.Sc / BCA / B.Com / BBA
 Subject : NMF: Food and Nutrition chemistry
 Hours / Week : 3
 Credits : 2

Semester : VI
 Class Code :
 Subject Code : UGEHA619
 Total Hours : 45
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
1	3	I	1.1 Nutrition and health concept 1.2 Classification of food	Lecture method	Food and Nutrition by Srirandhan Bansal	Assignment
2	3	I	1.3 Nutrients - macro and micro nutrients 1.4 Carbohydrate - source & classification	Lecture method	Food and Nutrition by Srirandhan Bansal	Test
3	3	I	1.5 Blood Sugar level 1.6 Carbohydrate metabolism	Lecture method	Food and Nutrition by Srirandhan bansal	Test
4	3	II	2.1 proteins - sources, classification and functions 2.2 Deficiency disease - ER	Lecture method	Food and Nutrition by Srirandhan Bansal	Assignment
5	3	II	2.3 protein - metabolism 2.4 Fats - sources, classification, function	Lecture method	Food and nutrition by Srirandhan bansal	Test
6	3	II	2.5 Deficiency diseases, energy requirement 2.6 Fat metabolism	Lecture method	Food and Nutrition by Srirandhan bansal	Test

7	3	III	3.1 vitamins - Classification, differences 3.2 Fat Soluble vitamin (A and D)	Lecture method	Food and Nutrition by Srirandhan bansal	Assignment
8	3	III	3.3 Fat soluble vitamin (E and K) 3.4 water soluble vitamin - Thiamine	Lecture method	Food and nutrition by Srirandhan bansal	Test
9	3	III	3.5 water soluble vitamin - Folate 3.6 Ascorbic acid - Sources functions.	Lecture method	Food and nutrition by Srirandhan bansal	Test
10	3	II	4.1 Minerals Classification 4.2 Major elements (Ca, P, Na, K)	Lecture method	Food and Nutrition by Srirandhan bansal	Assignment
11	3	II	4.3 Major elements (Fe, Mg, I and F) 4.4 Trace elements (Zn, Cu, Co, Se, Mo)	Lecture method	Food and Nutrition by Srirandhan bansal	Test
12	3	II	4.5 Balanced diet 4.6 Diet in pregnancy and lactation	Lecture method	Food and Nutrition by Srirandhan bansal	Test
13	3	I	5.1 vegetables - Nutritive value 5.2 Vegetable cookery	Lecture method	Food and Nutrition by Sri Lakshmi	Assignment
14	3	I	5.3 Fruits - Nutritive value 5.4 Ripening of fruits	Lecture method	Food and Nutrition by Sri Lakshmi	Test
15	3	I	5.5 Storage of fruits 5.6 Antioxidants.	Lecture method	Food and Nutrition by Sri Lakshmi	Test

<u>VII</u>	2	4	Principles and synthetic process involving phase transfer catalysis - nitriles from alkyl halides, benzoyl cyanides from benzoyl chloride.	Chalk & Board	Organic synthesis by Ahluwalia	Quiz, Written Test
<u>VIII</u>	2	4	Preparation of alkyl fluorides from alkyl halides, alcohols from alkyl halides using PTC	Chalk & Board	Organic synthesis by Ahluwalia	Quiz, Written Test
<u>IX</u>	2	4	Preparation of anides from alkyl halides, sodium alkyl sulphonates from alkyl halides using PTC	Chalk & Board	Organic synthesis by Ahluwalia	Quiz, Written Test
<u>X</u>	2	4	Preparation of alkyl nitrates, thiocyanates, cyanates and p-toluenesulphonates from alkyl halides using PTC	Chalk & Board	Organic synthesis by Ahluwalia	Quiz, Written Test
<u>XI</u>	2	4	Preparation of aryl ethers and thioethers, esterification using PTC	Chalk & Board	Organic synthesis by Ahluwalia	Quiz, Written Test
<u>XII</u>	2	4	Diazotransfer by phase transfer catalyst, dihalocarbene	Chalk & Board	Organic synthesis by Ahluwalia	Quiz, Written Test
<u>XIII</u>	2	5	Transition metal catalysed reactions - reaction and mechanism of Heck reaction and Suzuki cross coupling reaction	Chalk & Board	Organic reaction mechanism by Kalsi, Corey & Sundberg, Clayden, Cornforth	Quiz, Written Test
<u>XIV</u>	2	5	Reaction and mechanism of carbonylation, hydroformylation and epoxide-allylic alcohol rearrangement.	Chalk & Board	Organic reaction mechanism by Kalsi, Corey & Sundberg, Clayden.	Quiz, Written Test
<u>XV</u>	2	5	Chemoselectivity - reduction and oxidation - examples - calculation.	Chalk & Board	Organic synthesis by Coleman, Hekroy, etc. Chem 309, 2012 by Kalsi, etc.	Quiz, Written Test

LESSON PLAN

Academic Year : 2021-2022
Class : IMSC CHEMISTRY
Subject : PECHA20- POLYMER CHEMISTRY
Hours / Week : 3
Credits : 4

Semester : I
Class Code : P14
Subject Code : PECHA20
Total Hours : 45
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	3	1	Introduction - basic concepts of polymer science- definitions, degree of polymerization, molecular forces and chemical bonding in polymers	Power point presentation	Polymer science by V.R. Gowariker, Fred W. Billmeyer	Quiz, Written Test
II	3	1	classification of polymers- natural and synthetic- organic and inorganic- thermoplastic and thermosetting polymers- plastics, elastomers, fibres, liquid resins, linear, branched, cross linked, addition and condensation polymers.	Power point presentation	Polymer science by V.R. Gowariker	Quiz, Written Test
III	3	1	Polymerisation techniques - bulk, suspension, solution and emulsion techniques, mechanism and kinetics of addition polymerisation, cationic and anionic polymerization	Power point presentation	Polymer science by V.R. Gowariker	Quiz, Written Test
IV	3	1	Mechanism and kinetics of free radical and condensation polymerisation, coordination polymerization - mechanism using Ziegler Natta catalyst	Power point presentation	Polymer science by V.R. Gowariker	Quiz, Written Test
V	3	3	Polymer reactions- hydrolysis, acidolysis, hydrogenation, addition and substitution reactions, cyclisation, cross-linking and vulcanisation	Power point presentation	Polymer science by V.R. Gowariker	Quiz, Written Test
VI	3	3	Graft and block copolymers- definitions and reactions leading to the formation of graft and block copolymers	Power point presentation	Polymer science by V.R. Gowariker	Quiz, Written Test

<u>VII</u>	3	3	Types of degradation - chemical degradation, physical degradation, biodegradable polymers, and mechanism of degradation (thermal oxidation, photo-oxidation, mechanical degradation, degradation by ionizing radiation, osmotic shock)	Chalk and board	Polymer Science by V.R. Gowarikar, Fred W. Billmeyer	Quiz, Written Test
<u>VIII</u>	3	3	Degradation of special polymers: polyolefins, polyvinyl chloride (PVC) and polymethyl methacrylate (PMMA)	Power point presentation	Polymer Science by V.R. Gowarikar, Fred W. Billmeyer	Quiz, Written Test
<u>IX</u>	3	4	Physical properties, stress-strain behaviour, mechanical properties (tensile, flexural, impact, fatigue, modulus, creep, elongation) Electrical properties (dielectric strength, surface resistivity, volume resistivity, power factor, dielectric constant)	Chalk and board	Polymer Science by V.R. Gowarikar, Fred W. Billmeyer	Quiz, Written Test
<u>X</u>	3	*	Polymer processing - films sheets, moulding, compression, blow moulding, injection moulding, extrusion moulding, casting of films, calendaring, recycling of plastics, elastomers, impregnation, processing, rubber tapes, vulcanisation, properties, reticulating	Chalk and board	Polymer Science by V.R. Gowarikar, Fred W. Billmeyer, M.S. Rhalnagar	Quiz, Written Test
<u>XI</u>	3	4	Fibers - introduction, production, fiber spinning, textile fibers, industrial fibers, recycling.	Chalk and board	Polymer Science by V.R. Gowarikar, Fred W. Billmeyer	Quiz, Written Test
<u>XII</u>	3	4	Molecular weights of polymers - number average, weight average molecular weights, determination of molecular weight of polymers by viscometry, gel permeation chromatography (GPC), membrane osmometry, vapour phase osmometry, ultra centrifugation, light scattering and matrix assisted Laser Desorption Ionisation (MALDI) methods.	Chalk and board	Polymer Science by V.R. Gowarikar, Fred W. Billmeyer	Quiz, Written Test
<u>XIII</u>	3	5	Applications of polymers - industrially important polymers - synthesis, properties and uses of natural and synthetic polymers.	Chalk and board	Polymer Science by V.R. Gowarikar, Fred W. Billmeyer	Quiz, Written Test
<u>XIV</u>	3	5	Synthesis, properties and uses of polytetrafluoroethylene (Teflon), polystyrene, rayon, nylon, polyacrylates, polyvinyl chloride (PVC), polyacrylonitrile (PAN) and polystyrene-divinylbenzene.	Chalk and board	Polymer Science by V.R. Gowarikar, Fred W. Billmeyer	Quiz, Written Test
<u>XV</u>	3	5	Electrically conducting polymers - poly acetylene - poly aniline	Chalk and board	Polymer Science by V.R. Gowarikar, Fred W. Billmeyer	Quiz, Written Test

Academic Year : 2021 - 2022
Class : I BSc 2020/2021
Subject : UACHA20 - ALLIED CHEMISTRY - I
Hours / Week : 1
Credits : 4

Semester : I
Class Code : U33
Subject Code : UACHA20
Total Hours : 15
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	1	1	Heterocyclic compounds - Preparation, properties and uses of furan	Power point presentation	Advanced Organic chemistry by Bahl & Arun Bahl	Quiz, Written Test
II	1	1	Preparation, properties and uses of thiophene	Power point presentation	Advanced Organic chemistry by Bahl & Arun Bahl	Quiz, Written Test
III	1	1	Preparation, properties and uses of pyrazole	Power point presentation	Advanced Organic chemistry by Bahl & Arun Bahl	Quiz, Written Test
IV	1	1	Electrophilic substitution in benzene - Mechanism of nitration	Power point presentation	Advanced Organic chemistry by Bahl & Arun Bahl	Quiz, Written Test
V	1	1	Mechanism of halogenation and sulfonation	Power point presentation	Advanced Organic chemistry by Bahl & Arun Bahl	Quiz, Written Test
VI	1	1	Electrophilic substitution in benzene - Mechanism of alkylation and acylation	Power point presentation	Advanced Organic chemistry by Bahl & Arun Bahl	Quiz, Written Test

<u>VI</u>	1	3	Preparation and uses of polyethylene	Chalk and Board	Polymer Science by V.R. Gowariker	Quiz, Written Test
<u>VII</u>	1	3	Preparation and uses of PVC	Chalk and Board	Polymer Science by V.R. Gowariker	Quiz, Written Test
<u>VIII</u>	1	3	Protein fibres	Chalk and Board	Polymer Science by Fred W. Billmeyer	Quiz, Written Test
<u>IX</u>	1	3	Protein Fibres - chemical composition	Chalk and Board	Polymer Science by Fred W. Billmeyer	Quiz, Written Test
<u>X</u>	1	3	Properties of wool	Chalk and Board	Polymer Science by Fred W. Billmeyer	Quiz, Written Test
<u>XI</u>	1	3	Properties of silk	Chalk and Board	Polymer Science by Fred W. Billmeyer	Quiz, Written Test
<u>XII</u>	1	5	Dye chemistry - terms - chromophore, auxochrome, bathochromic shift, hypsochromic shift, hyperchromic shift	Chalk and Board	Advanced Organic Chemistry by Bahl & Arun Bahl	Quiz, Written Test
<u>XIII</u>	1	5	Azo and triphenylmethane dyes	Chalk and Board	Advanced Organic Chemistry by Bahl & Arun Bahl	Quiz, Written Test
<u>XIV</u>	1	5	Preparation of methyl orange	Chalk and Board	Advanced Organic Chemistry	Quiz

Academic Year : 2021 - 2022

Class : II MSc CHEMISTRY

Subject : PECTG20 - ORGANOMETALLIC AND BIOINORGANIC CHEMISTRY

Hours / Week : 2

Credits : 4

Semester : IV

Class Code : P14

Subject Code : PECTG 20

Total Hours : 30

Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	2	2	Addition reactions - 1,2 addition to double bonds	chalk and board	Inorganic chemistry by J. Huheey	Quiz, Written Test
II	2	2	Conjugation	chalk and Board	Advanced Inorganic chemistry by F.A. Cotton and G. Wilkinson	Quiz, Written Test
III	2	2	Deconjugation	chalk and Board	Advanced Inorganic chemistry by F.A. Cotton and G. Wilkinson	Quiz, Written Test
IV	2	2	oxidative addition reactions	Chalk and Board	Inorganic chemistry by J. Huheey	Quiz, Written Test
V	2	2	Reductive elimination reactions	Chalk and Board	Inorganic chemistry by J. Huheey	Quiz, Written Test
VI	2	2	substitution reactions of octahedral complexes and their mechanisms	Chalk and Board	Selected Topics in Inorganic chemistry by Mahid U. Malik, G.P. Tuli, R.D. Madan.	Quiz, Written Test

<u>VII</u>	2	2	Insertion reaction	chalk and board	Advanced Inorganic chemistry by F.A. Cotton and G. Wilkinson	Quiz, written Test
<u>VIII</u>	2	2	Rearrangement reactions of aluminium and tin compounds and their mechanisms	Chalk and Board	Advanced Inorganic Chemistry by F.A. Cotton, G. Wilkinson, J. Huheey.	Quiz, written test
<u>IX</u>	2	2	Fluxional isomerism - definition, examples and mechanism	Chalk and Board	Inorganic chemistry by M.C. Shriver, P.W. Atkins, C.H. Langford	Quiz, written Test
<u>X</u>	2	3	Hydrogenation of olefins (Wilkinson's catalyst), modification of the original catalyst.	chalk and Board	Advanced Inorganic chemistry by F.A. Cotton, G. Wilkinson, Inorganic chemistry by J. Huheey	Quiz, written Test
<u>XI</u>	2	3	Hydroformylation of olefins using cobalt and rhodium catalyst (oxo process)	chalk and Board	Advanced Inorganic Chemistry by F.A. Cotton and G. Wilkinson Inorganic chemistry by J. Huheey	Quiz, written Test
<u>XII</u>	2	3	oxidation of olefins to aldehydes and ketones (Wacker process)	Chalk and Board	Advanced Inorganic Chemistry by F.A. Cotton	Quiz, written Test
<u>XIII</u>	2	3	Cyclo oligomerisation of acetylene using Nickel catalyst (Reppe's catalyst)	chalk and Board	Inorganic chemistry by J. Huheey	Quiz, written Test
<u>XIV</u>	2	3	Olefin isomerization and its mechanism	chalk and Board	Inorganic Chemistry by M.C. Shriver, Atkins, Langford	Quiz, written Test
<u>XV</u>	2	3	Olefin metathesis and polymer catalyst	chalk and Board	Inorganic Chemistry by M.C. Shriver, Atkins, Langford	Quiz, written Test

Academic Year : 2021-2022
Class : II MSc
Subject : SOLID STATE CHEMISTRY AND NUCLEAR CHEMISTRY
Hours / Week : 1
Credits : 4

Semester : IV
Class Code : P14
Subject Code : PCCHN20
Total Hours : 15
Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	1	4	Rutherford's experiment, Types of nuclear reactions, Direct reactions, Photoneuclear and threshold nuclear reactions	Chalk and Board	Essentials of Nuclear Chemistry by H.J. Amickar; V.N. Dash	Quiz, Written Test
II	1	4	Modes of radioactive decay, nuclear isomerism, isomeric transition, Internal conversion, Stellar energy, nucleosynthesis of light and heavy elements	Chalk and Board	Essentials of Nuclear Chemistry by H.J. Amickar; V.N. Dash	Quiz, Written Test
III	1	4	Hydrogen burning, Carbon burning, e, s, γ , p and α processes	Chalk and Board	Essentials of Nuclear Chemistry by H.J. Amickar; V.N. Dash	Quiz, Written Test
IV	1	4	Separation of isotopes - Boron isotope - isotope exchange and laser irradiation	Chalk and Board	Essentials of Nuclear Chemistry by H.J. Amickar; V.N. Dash	Quiz, Written Test
V	1	4	Uranium isotope - ultracentrifugation	Chalk and Board	Essentials of Nuclear Chemistry by H.J. Amickar; V.N. Dash	Quiz, Written Test
VI	1	4	Uranium isotope - laser irradiation	Chalk and Board	Essentials of Nuclear Chemistry by H.J. Amickar; V.N. Dash	Quiz, Written Test

<u>VII</u>	1	4	Analytical applications of radioisotopes as tracers	Chalk and Board	Essentials of nuclear chemistry by H.J. Amtekar; U.N. Datta	Quiz, written test
<u>VIII</u>	1	4	Isotope dilution analysis	Chalk and Board	Essentials of nuclear chemistry by H.J. Amtekar; U.N. Datta	Quiz, written test
<u>IX</u>	1	4	Neutron activation analysis	Chalk and Board	Essentials of Nuclear Chemistry by H.J. Amtekar; U.N. Datta	Quiz, written Test
<u>X</u>	1	4	Age determination by tritium	Chalk and Board	Essentials of Nuclear chemistry by H.J. Amtekar; U.N. Datta	Quiz, written Test
<u>XI</u>	1	4	Age determination by carbon-14 content	Chalk and Board	Essentials of Nuclear Chemistry by H.J. Amtekar; U.N. Datta	Quiz, written Test
<u>XII</u>	1	2	Luminescence	Chalk & Board (Ref. Solid state chemistry and its applications by A.R. West and Smart & Moore)	Solid state chemistry and its applications by A.R. West and Smart & Moore	Quiz, written Test
<u>XIII</u>	1	2	Phosphors	Chalk and Board (Ref. Solid state chemistry and its applications by A.R. West and Smart & Moore)	Solid state chemistry and its applications by A.R. West and Smart & Moore	Quiz, written Test
<u>XIV</u>	1	2	Ruby Laser	Chalk & Board (Ref. Solid state chemistry and its applications by A.R. West and Smart & Moore)	Solid state chemistry and its applications by A.R. West and Smart & Moore	Quiz, written Test
<u>XV</u>	1	2	Neodymium Laser	Chalk & Board (Ref. Solid state chemistry and its applications by A.R. West and Smart & Moore)	Solid state chemistry and its applications by A.R. West and Smart & Moore	Quiz, written Test

Academic Year : 2021 - 2022
 Class : I MSc
 Subject : GROUP THEORY AND QUANTUM CHEMISTRY
 Hours / Week : 2
 Credits : 4

Semester : II
 Class Code : P14
 Subject Code : PCCHE20
 Total Hours : 30
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	2	3	Introduction to quantum mechanics - Black body radiation	Chalk and Board	Quantum Chemistry by R.K. Prasad	Quiz, Written Test
II	2	3	Rayleigh Jean's and Planck's law of radiation	Chalk and Board	Quantum Chemistry by R.K. Prasad	Quiz, Written Test
III	2	3	Photoelectric effect, Bohr's quantum theory	Chalk and Board	Quantum Chemistry by R.K. Prasad	Quiz, Written Test
IV	2	3	Compton effect	Chalk and Board	Quantum Chemistry by R.K. Prasad, R. Pantharaman	Quiz, Written Test
V	2	3	Quantum mechanical postulates - Operators - types of operators and Hermitian property	Chalk and Board	Quantum Chemistry by R.K. Prasad	Quiz, Written Test
VI	2	3	Particle in a box model (one and two dimensional cases)	Chalk and Board	Quantum Chemistry by D.A. McQuarrie	Quiz, Written Test

<u>vi</u>	2	3	Particle in a box model (three dimensional case)	Chalk and Board	Quantum chemistry by D.A. McQuarrie	Quiz, Written Test
<u>vii</u>	2	3	Schrodinger equation for hydrogen atom and He^+ ion	Chalk and Board	Quantum Chemistry by D.A. McQuarrie	Quiz, Written Test
<u>ix</u>	2	3	Origin of quantum numbers and their significance	Chalk and Board	Quantum Chemistry by R.K. Prasad	Quiz, Written Test
<u>x</u>	2	4	one dimensional harmonic oscillator	Chalk and Board	Quantum chemistry by D.A. McQuarrie	Quiz, Written Test
<u>xi</u>	2	4	Normalisation and the characteristics of the Eigen functions of a harmonic oscillator	Chalk and Board	Quantum Chemistry by D.A. McQuarrie	Quiz, Written Test
<u>xii</u>	2	4	The recursion formula for the Hermite polynomials, selection rules of the harmonic oscillator and space quantization of electronic orbitals	Chalk and Board	Quantum Chemistry by R.K. Prasad	Quiz, Written Test
<u>xiii</u>	2	4	Rotation of diatomic molecules - wave equation and solution of the rigid rotor	Chalk and Board	Quantum Chemistry by D.A. McQuarrie	Quiz, Written Test
<u>xiv</u>	2	4	Schrodinger wave equation and solution of particle in a ring.	Chalk and Board	Quantum Chemistry by D.A. McQuarrie	Quiz, Written Test
<u>xv</u>	2	4	Calculation of rotational constants and bond lengths of diatomic molecules	Chalk and Board	Quantum Chemistry by D.A. McQuarrie	Quiz, Written Test

Academic Year : 2021-2022
 Class : I BSc ZOOLOGY
 Subject : APPLIED CHEMISTRY - II
 Hours / Week : 2
 Credits : 4

Semester : II
 Class Code : U33
 Subject Code : UACHS20
 Total Hours : 30
 Total Marks : 100

Proposed Week	No. of Hrs	Unit	Topics to be Covered	Teaching Methodology	Learning Resources	Methods of Evaluation
I	2	1	coordination chemistry - Definition of the terms	chalk and Board	Modern Inorganic chemistry by R.D. Madan	Quiz, written Test
II	2	1	Nomenclature of mononuclear complexes	chalk and Board	Modern Inorganic Chemistry by R.D. Madan	Quiz, written Test
III	2	1	Werner's and Pauling Theory, Sidgwick's theory	chalk and Board	Modern Inorganic Chemistry by R.D. Madan	Quiz, written Test
IV	2	1	Effective Atomic Number rule	chalk and Board	Modern Inorganic chemistry by R.D. Madan	Quiz, written Test
V	2	1	chemistry of EDTA	chalk and Board	Modern Inorganic Chemistry by R.D. Madan	Quiz, written Test
VI	2	1	chemistry of haemoglobin and chlorophyll	chalk and Board	Modern Inorganic chemistry by R.D. Madan	Quiz, written Test

VII	2	1	Polymerism - types of isomerism	Chalk and Board	Modern Inorganic Chemistry by D. Madan	Quiz, written test
VIII	2	1	Metamerism - optical isomerism - cause of optical activity	Chalk and Board	Modern Inorganic Chemistry by R.D. Madan	Quiz, written test
IX	2	2	Optical isomerism of lactic acid and tartaric acid, R-S notation (one asymmetric carbon atom)	Chalk and Board	Advanced Organic Chemistry by Bahl & Arun Bahl	Quiz, written test
X	2	1	Racemisation and resolution	Chalk and Board	Advanced Organic Chemistry by Bahl & Arun Bahl	Quiz, written test
XI	2	2	Geometrical isomerism of maleic and fumaric acids, E-Z notation.	Chalk and Board	Advanced Organic Chemistry by Bahl & Arun Bahl	Quiz, written test
XII	2	2	Tautomerism - keto-enol tautomerism	Chalk and Board	Advanced Organic Chemistry by Bahl & Arun Bahl	Quiz, written test
XIII	2	5	Medicinal chemistry - Analgesics, antipyretics, antiseptics, tranquilisers, sedatives and hypnotics.	Chalk and Board	Textbook of Pharmaceutical Chemistry by Jayashree Ghosh	Quiz, written test
XIV	2	5	Local anaesthetics and general anaesthetics	Chalk and Board	Textbook of Pharmaceutical Chemistry by Jayashree Ghosh	Quiz, written test
XV	2	5	Drugs - Penicillin, streptomycin	Chalk and Board	Textbook of Pharmaceutical Chemistry by Jayashree Ghosh	Quiz, written test