

Annual Plan 2016-2017 (Odd Sem)

Name of the Faculty: R. Ramya

Subject: Physical Chemistry I (3hr/wk)

Department: Chemistry

Class and Semester: III B.Sc. Chemistry & V Sem

Unit	Month	Topics	Teaching Methods
I	June	Colligative properties & Adsorption: 1.1 Colligative properties-Lowering of vapour pressure-Osmosis and osmotic pressure-relation between osmotic pressure and vapour pressure of an ideal solution-reverse osmosis.	Lecture method
I	July	1.2 Elevation of boiling point and depression of freezing point-derivations and determinations vant Hoff factor. Slip test 1.3 Adsorption: Distinction between chemical and physical adsorption, adsorption isotherms – Freundlich adsorption isotherm- Langmuir adsorption isotherm – Derivation, measurement of surface area.	Lecture method
IV	August	Chemical Kinetics: 4.1 Definitions of terms- Derivations of expressions for Zero, First, Second and Third order rate equations -Study of kinetics by Volumetric, Polarimetric and dilatometric methods. Determination of order of the reactions. Slip test 4.2 Complex reactions – consecutive, parallel and reversible reactions (no derivation only examples) Effect of temperature on reaction rate – temperature coefficient – concept of activation energy – Arrhenius equation.	Lecture method
IV & V	September	4.3 Theories of reaction rates – Bimolecular collision theory- ARRT-Thermodynamic - aspects of ARRT. Comparison of collision theory and ARRT. Chemical Equilibrium: 5.1 Chemical equilibrium: Law of mass action- Law of chemical equilibrium-Thermodynamic derivation of Law of chemical equilibrium. 5.2 Vant Hoff reaction Isotherm-standard free energy change- Temperature Dependence of equilibrium Constant	Lecture method
V	October	5.2 Vant Hoff isochore- Le chatelier principle and its applications. 5.3 Enzyme catalysis: Mechanism and Kinetics of enzyme catalysis - MichaelisMenton Equation-effect of temperature on enzyme catalysis. Revision Internal Test	Power Point Presentation
	November	Commencement of University Examinations	

Annual Plan 2016-2017 (Odd Sem)

Name of the Faculty: R. Ramya

Subject: General Chemistry I (2hr/wk)

Department: Chemistry

Class and Semester: I B.Sc. Chemistry & ISem

Unit	Month	Topics	Teaching Methods
V	June	5.1 Definitions of molarity - normality - molality and mole fraction - their calculations	Lecture Method
V	July	Definition and examples for primary and secondary standards. Calculation of equivalent weight of acid, base, oxidizing agent, reducing agent and salt. Principle of Volumetric Analysis. Slip test	Lecture Method
V	August	5.2 Theories of acid-base - red-ox - complexometric, iodometric and iodimetric titrations. 5.3 Theories of indicators - acid-base indicators-choice of indicators - redox - metal ion and adsorption indicators.	Lecture Method
IV	September	4.1 Quantum chemistry - Quantum theory of radiation –The Sommerfield extension of Bohr theory- Planck's theory - photoelectric effect - Compton effect - Wave mechanical concept of the atom - de Broglie's relationship. Davisson and Germer experiment- wave nature of electron - Heisenberg's uncertainty principle. Slip test	Lecture Method
IV	October	4.2 Schrodinger wave equation (without derivation) - significance of wave functions, ψ and ψ^2 - probability distribution of electrons - radial probability distribution curves. Revision	Lecture Method
	November	Commencement of University Examination	

Annual Plan 2016-2017 (Even Sem)

Name of the Faculty: Dr. R. Ramya

Subject: Physical Chemistry II (2hr/wk)

Department: Chemistry

Class and Semester: III B.Sc. Chemistry & VI Sem

Unit	Month	Topics	Teaching Methods
I	December	Unit I Photochemistry 1.1 Interaction of radiation with matter, differences between thermal and photochemical processes. Laws of photochemistry: Grothus-Draper law, Stark-Einstein law, Jablonski diagram depicting various processes occurring in the excited state (internal conversion, intersystem crossing)	Lecture Method
I & II	January	Qualitative description of fluorescence, phosphorescence, chemiluminescence quantum yield- photosensitized reactions. 1.2 Kinetics of photochemical combinations- H ₂ -Cl ₂ and H ₂ -Br ₂ reactions. Slip test Unit 2: Electrochemistry I 2.1 Conduction in metals and in electrolyte solutions, specific conductance and equivalent conductance, measurement of equivalent conductance.	Lecture Method
II & III	February	2.1 Variation of equivalent and specific conductance with dilution-Ostwalds dilution law. 2.2 Debye Huckel theory of strong electrolytes-Onsagar equation (no derivation) Significance and limitations. Kohlrausch law and its applications. Slip Test Unit 3: Electrochemistry II 3.1 Migration of ions-ionic mobility- Transport number and its determination-Hittorff method and moving boundary method-abnormal transport number	Lecture Method
III	March	3.2 Applications of conductometric measurements-determination of degree of dissociation of weak electrolytes, ionic product of water, solubility product of a sparingly soluble salt, Conductometric titrations. pH concept-buffer solutions, buffer activity-Henderson equation-applications of buffer solutions. Revision	Lecture Method
	April	Revision	

Annual Plan 2016-2017 (Even Sem)

Name of the Faculty: Dr. R. Ramya

Subject: Pharmaceutical Chemistry (3hr/wk)

Department: Chemistry

Class and Semester: III B.Sc. Chemistry & VI Sem

Unit	Month	Topics	Teaching Methods
I	December	1.1 Definition of the following terms: drug, pharmacophore, pharmacology, pharmacopoeia, bacteria, virus, chemotherapy and vaccine. 1.2 Causes, symptoms and drug for jaundice, cholera, malaria and filaria. First aid for accidents - antidotes for poisoning. Slip Test	Lecture Method
II & III	January	2.1 Causes, detection and control of anaemia and diabeties. Diagnostic test for sugar, salt and cholesterol in serum and urine. 2.2 Indian medicinal plants and uses-Tulasi, Neem, Kizhanelli, Mango, Semparuthi, Adadodai and Thoothvelai. Internal Test I 3.1 Antibacterials: Sulpha drugs-examples and actions-prontosilsulphathiazole, sulphafurazole	Lecture Method
III & IV	February	3.1 Antibiotics-definition and action of penicillin, streptomycin, chloramphenicol - SAR of chloramphenicol only. 3.2 Antiseptics and disinfectants - definition and distinction-phenolic compounds, chloro compounds, and cationic surfactant. Slip test 4.1 Analgesics, Antipyretics and anti inflammatory agents : Definition and actions - narcotic and non narcotic- morphine and its derivatives, pethidine and methodone	Lecture Method
IV & V	March	4.1- salicylic derivative, paracetamol, ibuprofen - disadvantages and uses. 4.2 Causes, and treatment of cancer - AIDS - AZT, DDC. Internal Test II 5.1 Anaesthetics - definition-local and general - volatile nitrous oxide, ether, Chloroform, cyclo propane- trichloroethylene - uses and disadvantages. 5.2 Drugs affecting CNS - Definition, distinction and examples for tranquilizers, sedatives, hypnotics, psychedelic drugs - LSD Hashish- their effects. Internal Test III	Lecture Method
	April	Revision	

Annual Plan 2017-2018 (Odd Sem)

Name of the Faculty: R. Ramya

Subject: Physical Chemistry I (5hr/wk)

Department: Chemistry

Class and Semester: III B.Sc. Chemistry & V Sem

Unit	Month	Topics	Teaching Methods
I	June	Colligative properties & Adsorption: 1.1 Colligative properties-Lowering of vapour pressure-Osmosis and osmotic pressure-relation between osmotic pressure and vapour pressure of an ideal solution-reverse osmosis.	Lecture method
I& II	July	1.2 Elevation of boiling point and depression of freezing point-derivations and determinations vant Hoff factor. Slip Test. 1.3 Adsorption: Distinction between chemical and physical adsorption, adsorption isotherms – Freundlich adsorption isotherm- Langmuir adsorption isotherm – Derivation, measurement of surface area. Unit-II Phase rule: 2.1 Definition of terms: Phase, components and degrees of freedom – Derivation of Gibbs phase rule. 2.2 One component system: Water and sulphur system – Reduced phase rule- Two component system: Simple eutectic system: Pb-Ag system, KI-water system freezing mixtures.	Lecture method
II & III	August	2.3 Thermal analysis and cooling curves, Compound formation with congruent melting point Zn – Mg, FeCl ₃ – Water system. Compound formation with incongruent melting point Na – K System. Internal Test I Unit III Solution: 3.1 Raoult's law – Ideal solution, Henry's law. Temperature composition diagrams – ideal liquid mixture (Toluene – Benzene) Non ideal mixture (Water– ethanol and water – hydrogen chloride) – Azeotropic mixtures- Distillation of immiscible liquids. 3.2 Partially miscible liquids: Phenol – Water, Triethylamine – Water systems.	Lecture method
III&IV	September	3.3 Nernst distribution law – Thermodynamic derivation – limitations- Applications of Nernst distribution law – Solvent extraction and Determination of Hydrolysis constant. Unit IV Chemical Kinetics: 4.1 Definitions of terms- Derivations of expressions for Zero, First, Second and Third order rate equations -Study of kinetics by Volumetric, Polarimetric and dilatometric methods. Determination of order of the reactions. Slip test. 4.2 Complex reactions – consecutive, parallel and reversible reactions (no derivation only examples) Effect of temperature on reaction rate – temperature coefficient – concept of activation energy – Arrhenius equation.4.3 Theories of reaction rates – Bimolecular collision theory- ARRT-Thermodynamic - aspects of ARRT. Comparison of collision theory and ARRT. Internal Test II	Lecture method
V	October	Chemical Equilibrium: 5.1 Chemical equilibrium: Law of mass action- Law of chemical equilibrium-Thermodynamic derivation of Law of chemical equilibrium. 5.2 Vant Hoff reaction Isotherm-standard free energy change- Temperature Dependence of equilibrium Constant5.2 Vant Hoff isochore- Le chatelier principle and its applications. 5.3 Enzyme catalysis: Mechanism and Kinetics of enzyme catalysis - MichaelisMenton Equation-effect of temperature on enzyme catalysis. Internal Test III	Power Point Presentation
	November	Commencement of University Examinations	

Annual Plan 2017-2018 (Odd Sem)

Name of the Faculty: R. Ramya

Subject: Data Analysis and Separation Techniques (1hr/wk)

Department: Chemistry

Class and Semester: III B.Sc. Chemistry & VSem

Unit	Month	Topics	Teaching Methods
III	June	Unit III Introduction	Lecture Method
III	July	3.1 Chromatography-principles and techniques of column, paper and thin layer chromatography-Rf value-applications.	Lecture with Power Point presentation
III	August	3.2 Ion exchange chromatography-principle-experimental techniques and applications.	Lecture Method
IV	September	Unit 4 4.1 HPLC and GC- Principle, instrumentation and applications	Lecture Method
IV	October	GC-MS and LC-MS-Principle, instrumentation and applications	Lecture Method
	November	Commencement of University Examination	

Annual Plan 2017-2018 (Even Sem)

Name of the Faculty: Dr. R. Ramya

Subject: Physical Chemistry II (4hr/wk)

Department: Chemistry

Class and Semester: III B.Sc. Chemistry & VI Sem

Unit	Month	Topics	Teaching Methods
I	December	1.1 Interaction of radiation with matter, differences between thermal and photochemical processes. Laws of photochemistry: Grothus-Draper law, Stark-Einstein law, Jablonski diagram depicting various processes occurring in the excited state (internal conversion, intersystem crossing) Qualitative description of fluorescence, phosphorescence, chemiluminescence quantum yield- photosensitized reactions. 1.2 Kinetics of photochemical combinations- H ₂ -Cl ₂ and H ₂ -Br ₂ reactions.	Lecture Method
II & III	January	Unit II 2.1 Conduction in metals and in electrolyte solutions, specific conductance and equivalent Variation of equivalent and specific conductance with dilution-Ostwalds dilution law. 2.2 Debye Huckel theory of strong electrolytes-Onsagar equation (no derivation) Significance and limitations. Kohlrausch law and its applications. Unit III 3.1 Migration of ions-ionic mobility- Transport number and its determination-Hittorff method and moving boundary method-abnormal transport number	Lecture Method
III & IV	February	3.2 Applications of conductometric measurements-determination of degree of dissociation of weak electrolytes, ionic product of water, solubility product of a sparingly soluble salt, Conductometric titrations. pH concept- buffer solutions, buffer activity-Henderson equation-applications of buffer solutions. Electrochemistry – III: 4.1 Solubility product and its relationship with solubility - Hydrolysis of salts- expressions for hydrolysis constant, degree of hydrolysis and pH of aqueous salt solutions. 4.2 Electromotive force- Electrolytic and Galvanic cells-Daniel cell, Standard Weston cadmium cell reversible and irreversible cells, conventional representation of electrochemical cells. EMF of a cell and its measurement. Computation of cell EMF.- Nernst equation	Lecture Method
IV & V	March	4.3 Types of reversible electrodes: gas, metal-metal ion, metal-insoluble salt- anion, amalgam and redox electrodes. Single electrode potential, standard hydrogen electrode-reference electrodes-standard electrode potential, sign conventions. Derivation of thermodynamic quantities of cell reactions (ΔG , ΔH and ΔS), 5.1 Cells-types - Concentration cells with and without transference, liquid junction potential. 5.2 Applications of emf measurements-valency of doubtful ions, solubility product and activity coefficient, potentiometric titration- Determination of pH using hydrogen, quinhydrone and glass electrodes. 5.3 Decomposition potential and overvoltage (basic concepts)- fuel cells (H ₂ -O ₂ cell) Lead storage battery.	Lecture Method
	April	Revision	

Annual Plan 2017-2018 (Even Sem)

Name of the Faculty: Dr. R. Ramya

Subject: Pharmaceutical Chemistry (2hr/wk)

Department: Chemistry

Class and Semester: III B.Sc. Chemistry & VI Sem

Unit	Month	Topics	Teaching Methods
I	December	1.1 Definition of the following terms: drug, pharmacophore, pharmacology, pharmacopoeia, bacteria, virus, chemotherapy and vaccine.	Lecture Method
I & IV	January	1.2 Causes, symptoms and drug for jaundice, cholera, malaria and filaria. First aid for accidents - antidotes for poisoning. 4.1 Analgesics, Antipyretics and anti inflammatory agents : Definition and actions - narcotic and non narcotic- morphine and its derivatives, pethidine and methadone - salicylic derivative, paracetamol, ibuprofen - disadvantages and uses.	Lecture Method
IV & V	February	4.2 Causes, and treatment of cancer - AIDS - AZT, DDC. 5.1 Anaesthetics - definition-local and general - volatile nitrous oxide, ether, Chloroform, cyclopropane- trichloroethylene - uses and disadvantages.	Lecture Method
V	March	5.2 Drugs affecting CNS - Definition, distinction and examples for tranquilizers, sedatives, hypnotics, psychedelic drugs - LSD Hashish- their effects.	Lecture Method
	April	Revision	