

*Pimpalner Education Society's*

**Karm.A. M. Patil Arts, Commerce & Kai. AnnasahebN.  
K. Patil Science Senior College Pimpalner, Tal.- Sakri,  
Dist.- Dhule.**



NAAC Reaccredited 'B' Grade

## TEACHER'S DIARY

**ACADEMIC YEAR : 2021- 2022**

Name : Dr. W. B. Shirsath  
Designation : Associate Professor  
Department : Chemistry





## TEACHING PLAN

Class: F.Y. B.Sc. Sem.: I Subject: Chemistry Paper Code: CH-101

Sr. No.	Month	Topics/Practical's
1	Sept-2021	<p>Chapter-1st - Electrolytic Conductance.</p> <p>Electrolytic conductances, Equivalent Conductance, Variation of conductances with concentration, Equivalent Conductance of infinite dilution, Kohlrausch's law &amp; its application</p> <p>Application of Conductance measurement</p> <ol style="list-style-type: none"> <li>Solubility of sparingly soluble salt</li> <li>Determination of Degree of dissociation</li> <li>Determination of Ionic product of water.</li> <li>Conductometric titration - Acid-Base titration</li> </ol> <p>Advantages of Conductometric titration</p>
2	Oct-2021	<p>Chapter-2 - Surface Chemistry</p> <p>Introduction: Adsorption, mechanism of adsorption, factors affecting adsorption of gases by solids. Difference bet<sup>n</sup> adsorption &amp; absorption</p> <p>Types of adsorption, Physical &amp; Chemical adsorption, Adsorption of gases by solids, Types of adsorption isotherm - Freundlich adsorption &amp; Langmuir Adsorption isotherm.</p> <p>Chapter - Mathematical Preparation in Chemistry</p> <p>Logarithm - Rules of logarithm (without proof), Characteristic &amp; Mantissa, Negative logarithm in calculating PH with change of base of logarithm, antilogarithm.</p>
3	Nov-21	<p>Graphical representation of eq<sup>n</sup> - Rules for drawing graph - Coordinates etc. eq<sup>n</sup> of str. line, slope &amp; intercept, Plotting the graph from the data of chemistry Properties &amp; Problems.</p>

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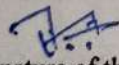


## TEACHING PLAN

Class: F.Y.B.Sc. Sem.: I Subject: Chemistry

Paper Code: (CH-10)

Sr. No.	Month	Topics/Practical's
	Nov-2021	<p><u>Differential</u> - Rule of differentiation, Algebraic logarithmic &amp; exponential function &amp; Numerical</p> <p><u>Integration</u>: Rule of integration, integration with limit, Algebraic, logarithmic &amp; exponential &amp; numerical.</p>
	Dec-2021	<p><u>Chapter - Periodic Properties</u>:-</p> <p><u>Atomic &amp; Ionic size</u> - definition &amp; explanation of atomic radius, Covalent radius, Vander Waals radius, Variation of atomic size along a period &amp; groups.</p> <p><u>Ionization energy</u>:- Definition &amp; explanation of atomic radius I.E. Factors affecting I.E. Variation of I.E. along period &amp; groups</p> <p>Application of I.E. to chemical behaviour of an element</p> <p><u>Electron affinity</u>:- Def<sup>n</sup> &amp; explanation factor affecting e<sup>-</sup> affinity. Variation of e<sup>-</sup> affinity along period &amp; groups</p> <p><u>Electronegativity</u> - Def<sup>n</sup> &amp; explanation, factors affecting variation of electronegativity, Pauling &amp; Mulliken method</p>
	Jan-2022	<p><u>S-block elements</u>: Electronic configuration</p> <p>Variation in properties of S-block elements - atomic radii, I.E., colour of flame, reducing properties</p> <p>metallic properties, Complexes of alkali metals with Salicylaldehyde, Acetyl acetone, Wrap around complex with polydentate ligand such as crown ether &amp; Cryptate, Complexes of alkali metal such as beryllium oxalate ion Chlorophyll Complexes of Ca &amp; Mg with EDTA</p>

  
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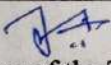
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## TEACHING PLAN

Class : S.V.B.Sc. Sem.: I Subject : Chemistry Paper Code.: CH-301

Sr. No.	Month	Topics/Practical's
		<p>Chapter 1 - Solution - Introduction Solubility factors affecting solubility Types of solution Different way of expressing the concentration Ideal &amp; non-ideal soln, classification of binary soln. of completely miscible liquid on the basis of Raoult's law.</p> <p>Binary Pt. diagram of miscible binary mixtures, Distillation of binary miscible solution Azeotropes, the fractionating column, Solubility of pure miscible liquid pairs</p> <p>Phase diagram, Phenol-Water system Triethylamine-Water. &amp; Nicotine-Water system.</p>
		<p>Chapter 2 :- Colligative Properties - Introduction Lowering of v.p. of solvent, Calculation of mol. wt from lowering of v.p. of solvent, B.P. elevation of soln. F.P. depression of soln. Calculation of mol. wt from depression in f.p.</p> <p>Osmosis &amp; o.p. Landberg's method for the determination of elevation of B.P. &amp; Berkeley &amp; Harvey method soln of electrolyte, Colligative property of electrolyte, Solved numerical problems.</p> <p>The d-block elements: Elements of 2<sup>nd</sup>, 3<sup>rd</sup> &amp; 4<sup>th</sup> transition series, General characteristics of d-block elements - a) metallic character b) molar volume &amp; densities c) Atomic radius &amp; Ionic radius d) m.p. &amp; B.P. e) I.E. f) Reactivity g) oxidation state h) Standard electrode potential i) Reducing property j) Colours k) magnetic properties l) Catalytic properties</p> <p>Tendency to form complexes.</p>

  
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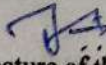


## TEACHING PLAN

Class : S.Y.B.Sc Sem.: I Subject : Chemistry

Paper Code : CH-104

Sr. No.	Month	Topics/Practical's
		<p><u>Chapter-1 - Introduction to Analytical Chemistry</u>                      Introduction, Importance of analytical chemistry                      Types of analysis - quantitative &amp; qualitative                      Concept of sampling, definition, procedure                      for sampling, Types of sampling                      Accuracy, precision, significant figure, significant                      of zero, rounding off.                      Error - Defn Types of error, Source of                      error, minimization of error, Good laboratory                      practice, material, safety data sheet, fire                      handling of chemicals.</p>
		<p><u>Chapter-2 Acid-Base titration - Principles</u> Acid-Base                      indicator, Havelbach eq<sup>n</sup>, titration range of indicator                      Acid-Base titration w.r.t. to neutralisation curve                      Selection of Indicator &amp; calculation of pH - B.P.A. &amp; C.A.                      2) S.B &amp; W.A; Application of Acid-Base titration</p>
		<p><u>Chapter-3 : Precipitation titration - Principle</u>, titration                      curve, use of indicator, detection of end pt, Precipitation                      of AgNO<sub>3</sub> sol<sup>n</sup>, Standardisation by Mohr's method                      Estimation of halide by Fajan's method, Application.</p>
		<p><u>Chapter-4 - Chromatography - Defn</u> Introduction                      Advantages, disadvantages of Chromatography, Principle of                      chromatography, classification of Chromatography                      Partition adsorption, Ion exchange Paper Chromatography                      Paper Chromatography - ascending &amp; descending                      Rf value - Application                      Thin layer Chromatography (TLC) Principle                      Technique &amp; application                      Ion exchange Chromatography - Cation-anion exchange                      Resins, Principle technique &amp; application.</p>

  
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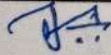
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## TEACHING PLAN

Class: F.Y. B.Sc Sem.: II<sup>nd</sup> Subject: Chemistry Paper Code.: CH-201

Sr. No.	Month	Topics/Practical's
		<p>Chapter-I: Gaseous State - The Kinetic theory of ideal gases, Assumption of Kinetic theory of gases, Kinetic gas eq<sup>n</sup> and its significance. Deduction of gas law, Avogadro Principle. Graham's law, Kinetic energy of translation. Derivation of real gases from ideal behaviour, Reasons for deviation, Compressibility factor, Vander-weal's eq<sup>n</sup> its application.</p> <p>Andrew's Isotherm of eq<sup>n</sup>, Relation bet<sup>n</sup> critical constant and Vanderweal constant, <del>trans</del> Liquefaction of gases, Joule-Thomson effect, related numerical.</p> <p>Chapter-II<sup>nd</sup> - Liquid State.</p> <p>Introduction Surface tension, unit of S.T. factors affecting S.T. determination of S.T. Single capillary rise method &amp; Stalagmometer method. Viscosity of liquids, unit of viscosity, measurement of viscosity of liquid by Ostwald method, Problems.</p> <p>Chapter-III<sup>rd</sup> - II<sup>nd</sup> law of thermodynamics</p> <p>Introduction, limitation of I<sup>st</sup> law of thermodynamics. Spontaneous &amp; non-spontaneous Processes with examples. Statement of II<sup>nd</sup> law of thermodynamics, Entropy. Entropy change for System, mixing of ideal gases. Physical transformations and related numericals.</p> <p>Chapter-IV - metal &amp; metallurgy, overview of metal.</p> <p>Various steps involved in metallurgical process, Concentration of ores, reduction, leaching, reduction to free metal. Electrometallurgy, metallic character, defining of metal.</p> <p>Chapter-V - P-block elements - Electronic configuration, variation in properties, atomic radius, I.E. electronegativity, metallic character, oxidation states, reactivity, Acidic-basic character of hydrogen, Bonding &amp; shapes of following molecules - <math>\text{H}_2, \text{O}_2, \text{P}_4, \text{S}_8, \text{Cl}_2, \text{diamond}</math> etc.</p>

  
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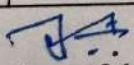


## TEACHING PLAN

Class : S.Y.B.Sc. Sem.: II Subject : Chemistry

Paper Code. : (11-101)

Sr. No.	Month	Topics/Practical's
		<p><b>Chapter-I - Electrochemistry - Introduction</b>                      Emf of its measurement, Reversible &amp; Irreversible                      Std. cell, cell reaction &amp; Emf Convention, Sign of emf, Single electrode Potential, Std. Hydrogen &amp; Calomel electrode.</p> <p>Calculation of single electrode potential                      Calculation of cell emf from single electrode potential, Thermodynamics of electrode potential (Nernst eq<sup>n</sup>) Std. Potential &amp; eq<sup>m</sup> constant.                      Classification of electrolytes related numerical.</p> <p><b>Chapter-II - Chemical thermodynamics</b>                      Introduction, The Helmholtz free energy <math>\Delta A</math> for reaction Gibbs free energy <math>\Delta G</math> for chemical reaction. Significance of free energy, Calculation of free energy, Fugacity &amp; activity concept, The Leach criterion                      Std. free energy change of formation (Criteria of physical equilibria involving pure substances)                      Clapeyron Clausius-Clapeyron eq<sup>n</sup> its uses - V.P. of liquid, variation of v.p. with temp. Differential form of Clausius-Clapeyron eq<sup>n</sup> &amp; its application.</p> <p><b>Chapter-III - Basic concept of Co-ordination Chemistry</b>                      Double salt &amp; Co-ordination compounds, Co-ordination complex, related numericals, Co-ordination number, Types of ligands, Chelating ligand &amp; Chelates, Physical method used in study of complex, Nomenclature of Co-ordination compounds.</p> <p><b>Chapter-IV - Conductors, Insulators &amp; Semiconductors</b>                      General properties of metals, Conductors, Insulators &amp; Semiconductors, Intrinsic &amp; extrinsic Semiconductors.                      Application of Semiconductors.</p>

  
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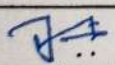
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### TEACHING PLAN

Class : S.Y.B.Sc., Sem.: II Subject : Chemistry Paper Code. : CH-404

Sr. No.	Month	Topics/Practical's
		<p><u>Chapter-I - Redox titration -</u>                      Oxidation-reduction, redox reaction, oxidising agents, redox titration, Titration of <math>\text{Ce(IV)}</math> vs <math>\text{Fe(II)}</math>                      Nature of titration curve, Calculation of emf during titration                      Detection of end point, redox indicators                      Self indicator &amp; starch indicator                      Titration involving iodine - Iodometry &amp; Iodometry, Determination of dissolved oxygen (<math>\text{O}_2</math>) of water sample, Application of redox titration</p> <p><u>Chapter-II - Complexometric titration.</u>                      Complexes, ligand, types of ligands, Chelate, Chelating agent, Formation of complexes, Formation constant, Chelating agent, EDTA equilibria, EDTA titration curve; Detection of end-use of indicators, Principle involved in colour change of indicators, characteristics of metal ion indicator                      Application of complexometric titration with reference to analysis of soil, Estimation of Calcium &amp; magnesium ions by complexometric titration</p> <p><u>Chapter-III - Gravimetric analysis -</u>                      Introduction, Advantages of gravimetric analysis                      Solubility product, Condition for precipitation                      Steps of gravimetric analysis, Precipitation of salt                      precipitation digestion, Impurities in the precipitate                      Co-precipitation &amp; post precipitation, Filtration                      Washing drying or ignition Weighing                      Application - estimation of Ba as <math>\text{BaSO}_4</math>                      Ni. as <math>\text{Ni}_2\text{S}_3</math>, Pb as <math>\text{PbSO}_4</math></p>



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