Arts, Science and Commerce College, Indapur, Dist. Pune

TEACHING AND EVALUATION PLAN

Name of the teacher: Prof. Mane U.L	**A. Year:** 2021-2022		**Semester:** V
Subject: Physical Chemistry	**Paper:** IV CHE-501	**Class:**	T Y B Sc

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods available	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
1	Nov2020	2,3 & 4	10	10	**1. Quantum Chemistry [10 L]** Introduction, de Broglie hypothesis, The Heisenberg's uncertainty principle, quantisation of energy, Operators, Schrodinger wave equation, well behaved function, Particle in a one-, two and three-dimensional box (no derivation), Physical interpretation of the ψ and ψ2, sketching of wave function and probability densities for 1D box, degeneracy, applications to conjugated systems, zero-point energy and quantum tunnelling, Numerical.	10	**1. Quantum Chemistry [10 L]** Introduction, de Broglie hypothesis, The Heisenberg's uncertainty principle, quantisation of energy, Operators, Schrodinger wave equation, well behaved function, Particle in a one-, two and three-dimensional box (no derivation), Physical interpretation of the ψ and ψ2, sketching of wave function and probability densities for 1D box, degeneracy, applications to conjugated systems, zero-point energy and quantum tunnelling, Numerical	Nil	--
2	Dec 2020	1,2,3 &4	12	12	**2. Investigation of Molecular structure [16 L]** **Introduction:** Molar refraction and molecular structure, Dipole moment and molecular structure, electromagnetic spectrum, energy of molecules, Types of molecular spectra.	12	**2. Investigation of Molecular structure [16 L]** **Introduction:** Molar refraction and molecular structure, Dipole moment and molecular structure, electromagnetic spectrum, energy of molecules, Types of molecular spectra.	Nil	--

					Microwave Spectroscopy: **Infrared Spectroscopy:**		**Microwave Spectroscopy:** **Infrared Spectroscopy:**		
3	January 2022	1,2,3 &4	12	15	**Raman Spectroscopy:** **3. Photochemistry [10 L]** Introduction, Difference between thermal and photochemical processes, Laws of photochemistry: i) Grothus - Draper law ii) Stark-Einstein law, Quantum yield, Reasons for high and low quantum yield., Factors affecting Quantum yield, Experimental method for the determination of quantum yield, types of photochemical reactions - photosynthesis, photolysis, photocatalysis, photosensitization, Jablonski diagram depicting various processes occurring in the excited state: Qualitative description of fluorescence and phosphorescence, Chemiluminescence, Problems.	15	**Raman Spectroscopy:** **3. Photochemistry [10 L]** Introduction, Difference between thermal and photochemical processes, Laws of photochemistry: i) Grothus - Draper law ii) Stark-Einstein law, Quantum yield, Reasons for high and low quantum yield., Factors affecting Quantum yield, Experimental method for the determination of quantum yield, types of photochemical reactions - photosynthesis, photolysis, photocatalysis, photosensitization, Jablonski diagram depicting various processes occurring in the excited state: Qualitative description of fluorescence and phosphorescence, Chemiluminescence, Problems.	03	03 Extra lectures are taken

Semester VI **Paper: IV CHE- 601** **Year : 2021-2022**

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods available	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
1	April 2022	1,2,3 & 4	12	12	**1. Electrochemical Cells [16 L]** Electrochemical cells, reversible and irreversible cells with examples, The e.m.f. of electrochemical cell and its measurement, The Weston standard cell, Reference electrodes: The primary reference electrode and Secondary reference electrodes, The Nernst equation for E.M.F. of a cell. Types of reversible electrodes, the sign convention for electrode potentials, Thermodynamics of reversible cells and reversible electrodes, E.M.F. and equilibrium constant of cell reaction, Electrochemical series, Types of concentration cells, liquid junction potential, salt bridge, Applications of emf measurements: 1. Determination of pH of a solution by using hydrogen electrode, quinhydrone electrode and glass electrodes 2. Potentiometric titrations: i) Acid-base titrations, (ii) Redox titrations. (iii) Precipitation titration.	12	**1. Electrochemical Cells [16 L]** Electrochemical cells, reversible and irreversible cells with examples, The e.m.f. of electrochemical cell and its measurement, The Weston standard cell, Reference electrodes: The primary reference electrode and Secondary reference electrodes, The Nernst equation for E.M.F. of a cell. Types of reversible electrodes, the sign convention for electrode potentials, Thermodynamics of reversible cells and reversible electrodes, E.M.F. and equilibrium constant of cell reaction, Electrochemical series, Types of concentration cells, liquid junction potential, salt bridge, Applications of emf measurements: 1. Determination of pH of a solution by using hydrogen electrode, quinhydrone electrode and glass electrodes 2. Potentiometric titrations: i) Acid-base titrations, (ii) Redox titrations. (iii) Precipitation titration.	Nil	--

2	May 2022	1,2,3 ,& 4	12	12	Batteries: Primary and Secondary batteries, applications for Secondary Batteries, Fuel Cells: Types of fuel cells, advantages, disadvantages of fuels cells, comparison of battery Vs fuel cell. **2. Crystal structure [10 L]** Types of Solids: Isotropy and Anisotropy, Laws of crystallography: Law of constancy of interfacial angles, Law of rational indices, Law of crystal symmetry, Weiss indices and Miller indices, Crystal Structure: Parameters of the Unit Cells, Cubic Unit Cells: Three Types of Cubic Unit Cells, Calculation of Mass of the Unit Cell, Methods of Crystal structure analysis:	12	Batteries: Primary and Secondary batteries, applications for Secondary Batteries, Fuel Cells: Types of fuel cells, advantages, disadvantages of fuels cells, comparison of battery Vs fuel cell. **2. Crystal structure [10 L]** Types of Solids: Isotropy and Anisotropy, Laws of crystallography: Law of constancy of interfacial angles, Law of rational indices, Law of crystal symmetry, Weiss indices and Miller indices, Crystal Structure: Parameters of the Unit Cells, Cubic Unit Cells: Three Types of Cubic Unit Cells, Calculation of Mass of the Unit Cell, Methods of Crystal structure analysis:	0		
3	June 2022	1,2,3 ,& 4	12	12	**3. Nuclear Chemistry [10L]** Radioactivity, Types of Radiations, Properties of Radiations, Detection and Measurement of Radioactivity: Cloud chamber, Ionization Chamber, Geiger-Muller Counter, Scintillation Counter and Film Badges, Nuclear structure, Classification of nuclides, Types of Radioactive Decay, The Group Displacement Law, Kinetics of Radioactive Decay, Half-life, average life, Energy released in nuclear reaction, Mass Defect, Nuclear Binding Energy, Some applications of radio-isotopes as tracers: Chemical investigation –	12	**3. Nuclear Chemistry [10L]** Radioactivity, Types of Radiations, Properties of Radiations, Detection and Measurement of Radioactivity: Cloud chamber, Ionization Chamber, Geiger-Muller Counter, Scintillation Counter and Film Badges, Nuclear structure, Classification of nuclides, Types of Radioactive Decay, The Group Displacement Law, Kinetics of Radioactive Decay, Half-life, average life, Energy released in nuclear reaction, Mass Defect, Nuclear Binding Energy, Some applications of radio-isotopes as tracers: Chemical investigation – Esterification, Friedel - Craft reaction, Structural			

					Esterification, Friedel -Craft reaction, Structural determination – Phosphorus pentachloride, Age determination – use of tritium and C_{14} dating, Problems		determination – Phosphorus pentachloride, Age determination – use of tritium and C_{14} dating, Problems		

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Signature of Teacher | Signature of Head of Department | Signature of Faculty In-charge | Signature of the Principal

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TEACHING AND EVALUATION PLAN

Name of the teacher: Prof . Mane U.L	**A. Year:** 2021-2022		**Semester: III**
Subject: Physical & Analytical Chemistry		**Paper: I CH-301**	**Class:** S.Y.B.Sc

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	**Month**	**Week**	**No. of working days**	**No. of periods available**	**Topics to be taught**	**No. of periods engaged**	**Topics taught**	**Deviation in periods**	**Remarks**
1	Nov2021	2,3 & 4	12	12	**1. Chemical Kinetics: [12 L]** Introduction to kinetics, the rates of chemical reactions – definition of rates, rate laws and rate constants, reaction order and molecularity, determination of rate law, factors affecting reaction rates, integrated rate laws – zeroth-order reactions, first-order	12	**1. Chemical Kinetics: [12 L]** Introduction to kinetics, the rates of chemical reactions – definition of rates, rate laws and rate constants, reaction order and molecularity, determination of rate law, factors affecting reaction rates, integrated rate laws – zeroth-order reactions, first-order reactions, second-order	Nil	--

					reactions, second-order reactions (with equal and unequal initial concentration of reactants), half-life period, methods for determination order of a reactions, Arrhenius equation- temperature dependence of reaction rates, interpretation of Arrhenius parameters, reaction dynamics - collision theory and transition-state theory of bimolecular reactions, comparison of the two theories, Problems.		reactions (with equal and unequal initial concentration of reactants), half-life period, methods for determination order of a reactions, Arrhenius equation- temperature dependence of reaction rates, interpretation of Arrhenius parameters, reaction dynamics - collision theory and transition-state theory of bimolecular reactions, comparison of the two theories, Problems.		
2	Dec 2021	1,2,3 &4	14	14	**2. Surface Chemistry [6L]** Introduction to surface chemistry - some basic terms related to surface chemistry adsorption, adsorption materials, factors affecting adsorption, characteristics of adsorption, types of adsorption, classification of adsorption isotherms, Langmuir adsorption isotherm, Freundlich's adsorption isotherm, BET theory (only introduction), application of adsorption, problems. **3. Errors in Quantitative Analysis [5 L]** Introduction to errors, limitations of analytical methods, classifications of errors, accuracy, precision, minimization of errors, significant figures and computation, methods of	14	**2. Surface Chemistry [6L]** Introduction to surface chemistry - some basic terms related to surface chemistry adsorption, adsorption materials, factors affecting adsorption, characteristics of adsorption, types of adsorption, classification of adsorption isotherms, Langmuir adsorption isotherm, Freundlich's adsorption isotherm, BET theory (only introduction), application of adsorption, problems. **3. Errors in Quantitative Analysis [5 L]** Introduction to errors, limitations of analytical methods, classifications of errors, accuracy, precision, minimization of errors, significant figures and computation, methods of expressing accuracy and precision: mean and standard deviations,	Nil	--

					expressing accuracy and precision: mean and standard deviations, reliability of results and numerical.		reliability of results and numerical.		
3	January 2022	1,2 & 3	13	13	**4. Volumetric Analysis [13 L]** Introduction to volumetric analysis, classification of reactions in volumetric analysis, standard solutions, equivalents, normalities, and oxidation numbers, preparation of standard solutions, primary and secondary standards. **1. Neutralization titrations 2. ComplexometricTitrations 3. Redox Titrations: 4. Precipitation titrations:**	13	**4. Volumetric Analysis [13 L]** Introduction to volumetric analysis, classification of reactions in volumetric analysis, standard solutions, equivalents, normalities, and oxidation numbers, preparation of standard solutions, primary and secondary standards. **1. Neutralization titrations 2. ComplexometricTitrations 3. Redox Titrations: 4. Precipitation titrations:**	01	One Extra Lec taken

Semester IV **Paper: I CH-401** **Year : 2021-2022**

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	**Month**	**Week**	**No. of working days**	**No. of periods available**	**Topics to be taught**	**No. of periods engaged**	**Topics taught**	**Deviation in periods**	**Remarks**
1	May 2022	1,2,& 3	09	09	**1 1. Phase equilibrium [9L]** Introduction; definitions of phase, components and degrees of freedom of a system; stability of phases, criteria of phase equilibrium. Gibbs phase rule and its thermodynamic derivation, phase diagrams of one- component systems- water, carbon dioxide and	09	**1. Phase equilibrium [9L]** Introduction; definitions of phase, components and degrees of freedom of a system; stability of phases, criteria of phase equilibrium. Gibbs phase rule and its thermodynamic derivation, phase diagrams of one-component systems- water, carbon dioxide and sulphur systems,	Nil	--

					sulphur systems, problems.		problems.		
2	June 2022	1,2,3 ,& 4	12	12	**2. Ideal and real solutions [9L]** Introduction, chemical potential of liquids - ideal solutions, ideal dilute solutions -Raoult's and Henry's Law, liquid mixtures, phase diagram of binary systems : liquids -vapour pressure diagrams, temperature composition diagrams, liquid-liquid phase diagrams, solubility of partially miscible liquids-critical solution temperature, effect of impurity on partially miscible liquids, Problems. **3. Conductometry [6 L]** Introduction, Electrolytic Conductance, Resistance, conductance, Ohm's law, cell constant, specific and equivalent conductance, molar conductance, variation of equivalent and specific conductance with concentrations, Kohlrausch's law and its applications, conductivity cell, conductivity meter, Whetstone Bridge, determination of cell constant, conductometric titrations (strong acid-strong base, strong acid-weak base, weak acid strong base) and Numericals.	15	**2. Ideal and real solutions [9L]** Introduction, chemical potential of liquids - ideal solutions, ideal dilute solutions -Raoult's and Henry's Law, liquid mixtures, phase diagram of binary systems : liquids -vapour pressure diagrams, temperature composition diagrams, liquid-liquid phase diagrams, solubility of partially miscible liquids-critical solution temperature, effect of impurity on partially miscible liquids, Problems. **3. Conductometry [6 L]** Introduction, Electrolytic Conductance, Resistance, conductance, Ohm's law, cell constant, specific and equivalent conductance, molar conductance, variation of equivalent and specific conductance with concentrations, Kohlrausch's law and its applications, conductivity cell, conductivity meter, Whetstone Bridge, determination of cell constant, conductometric titrations (strong acid-strong base, strong acid-weak base, weak acid strong base) and Numericals.	03	03 Extra Lectures are taken.

3	July 2022	1,2,3 ,& 4	12	12	**4. Colorimetry: [6 L]** Introduction, interaction of electromagnetic radiation with matter, essential terms: radiant power, transmittance, absorbance, molar, Lamberts Law, Beer's Law, Lambert-Beer's Law, molar absorptivity, deviations from Beer's Law, Colorimeter: *Principle, Construction and components, Working*. Applications–unknown conc. By calibration curve method, Determination of unknown concentration of Fe(III) by thiocynate method, Numericals. **5. Column Chromatography [6 L]** Introduction, Principle of Column Chromatography, **Ion Exchange Chromatography:** Ion exchange resins, action of ion exchange resin (Ion exchange equilibria, Ion exchange capacity), Experimental technique, Application: i) Separation of Metal ions / non-metal ions on Ion Exchange Chromatography (*Zn(II) and Mg(II), Cl- and Br-),* ii) Purification of water. **Adsorption Chromatography – Liquid solid chromatography**: Introduction, the technique of conventional chromatography, column packing materials,	12	**4. Colorimetry: [6 L]** Introduction, interaction of electromagnetic radiation with matter, essential terms: radiant power, transmittance, absorbance, molar, Lamberts Law, Beer's Law, Lambert-Beer's Law, molar absorptivity, deviations from Beer's Law, Colorimeter: *Principle, Construction and components, Working*. Applications–unknown conc. By calibration curve method, Determination of unknown concentration of Fe(III) by thiocynate method, Numericals. **5. Column Chromatography [6 L]** Introduction, Principle of Column Chromatography, **Ion Exchange Chromatography:** Ion exchange resins, action of ion exchange resin (Ion exchange equilibria, Ion exchange capacity), Experimental technique, Application: i) Separation of Metal ions / non-metal ions on Ion Exchange Chromatography (*Zn(II) and Mg(II), Cl- and Br-),* ii) Purification of water. **Adsorption Chromatography –Liquid solid chromatography**: Introduction, the technique of conventional chromatography, column packing materials, Selection of solvent for adsorption chromatography, Adsorption column preparation and loading, Application – Purification of		

					Selection of solvent for adsorption chromatography, Adsorption column preparation and loading, Application – Purification of anthracene Size Exclusion Chromatography.		anthracene Size Exclusion Chromatography.		

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Incharge
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TEACHING AND EVALUATION PLAN

Name of the teacher: Prof. Deokate Kavita bhagwan | Year: 2021-2022 | Semester: VI
Subject:Inorganic Chemistry | Paper: CH-604 Inorganic chemistry II | Class: TYBSc

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods available	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
1	Dec 2021	3 &4	12	6	Organometallic chemistry	8	Organometallic chemistry	2	Extra lecture was conducted
2	January 2022	1& 2	12	6	Homogeneous and heterogeneous catalysis	4	Homogeneous and heterogeneous catalysis	Nil	--
3	January 2022	3 & 4	11	6	Homogeneous and heterogeneous catalysis ,Bioinorganic chemistry	4	Homogeneous and heterogeneous catalysis ,Bioinorganic chemistry	Nil	--
4	Feb 2022	1 &2	11	6	Bioinorganic chemistry and Inorganic polymers	4	Bioinorganic chemistry and Inorganic polymers	Nil	--
5	Mar 2022	1 & 2	12	6	Inorganic solids or ionic liquid of technological importance	4	Inorganic solids or ionic liquid of technological importance	Nil	--

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TEACHING AND EVALUATION PLAN

Name of the teacher: Dr. M. P. Shinde	**Year: 2021-2022**
Semester: I	
Subject: Analytical Chemistry	**Paper ;CH-502** **Class: T Y B Sc**

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	**Month**	**Week**	**No. of working days**	**No. of periods available**	**Topics to be taught**	**No. of periods engaged**	**Topics taught**	**Deviation in periods**	**Remarks**
1	Nov2020	3 & 4	9	8	**Gravimetry** Introduction to gravimetric analysisPrecipitation methods	8	**Gravimetry (9 L)** Introduction to gravimetric analysis, Precipitation methods	Nil	--
2	Dec 2020	1& 2	12	8	Applications of gravimetry & problems & introduction to Inorganic Qualitative analysis	10	Applications of gravimetry & problems & introduction to Inorganic Qualitative analysis	Nil	--
3	Dec 2020	3 & 4	11	7	Solution preparation, separation of basic radicals & acidic radicals & removal of interfering radicals	8	Solution preparation, separation of basic radicals & acidic radicals & removal of interfering radicals	1	Extra lecture was conducted on sunday
4	January 2021	1 &2	11	8	Thermal methods of analysis & its Applications & Parameters of Instrumental analysis	8	Thermal methods of analysis & its Applications & Parameters of Instrumental analysis	Nil	--
5	January 2021	3 & 4	12	8	**UV-Visible spectroscopy** Introduction, Theory & problems	8	**UV-Visible spectroscopy** Introduction, Theory & problems	Nil	--

Semester II **Paper: CH-611 A** **Year : 2021-2022**

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods available	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
1	July 2021	2 & 4	11	8	Solvent Extraction: Principlee,theoey and problems and Interoduction to Chromatography and its classification	8	Solvent Extraction: Principlee,theoey and problems and Interoduction to Chromatography and its classification	Nil	--
2	August 2021	1 &2	11	8	Theory, technique and applications of Column chromatography, Paper chromatography & problems	9	Theory, technique and applications of Column chromatography, Paper chromatography & problems	1	Extra lecture was conducted
3	Sept 2021	1 & 2	12	8	Gas chromatography, GLC, GSC, HPLC, Principal, instrumentation & applications, SFC: Introduction	8	Gas chromatography, GLC, GSC, HPLC, Principal, instrumentation & applications, SFC: Introduction	Nil	--
4	Sept 2021	3 & 4	12	8	Electrophoresis: Introduction, Principle and theory	8	Electrophoresis: Introduction, Principle and theory		--
5	Oct 2021	1 & 2	12	8	Nephelometry and Turbidimetry Introduction, Principles instrumentation & problems	9	Nephelometry and Turbidimetry Introduction, Principles instrumentation & problems	1	Extra lecture was conducted

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Signature of Teacher **Signature of Head of Department** **Signature of Faculty In-charge** **Signature of the Principal**

Arts, Science and Commerce College, Indapur, Dist. Pune

TEACHING AND EVALUATION PLAN

Name of the Teacher : Mr. Nanaware R. M. Year: 2021-22 Semester: I

Subject: Inorganic Chemistry Paper: CH - 504 Class: T.Y.B.Sc.

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods available	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
1	Sept.	1&2	9	6	1. Molecular Orbital Theory Limitations of VBT,LCAO principle, types of combinations of MOs,	6	2. Molecular Orbital Theory Limitations of VBT,LCAO principle, types of combinations of MOs,,	Nil	
		3&4	12	6	Inorganic reaction mechanism	6	Inorganic reaction mechanism	Nil	
		5	4	2	Chemistry of transition elements	2	Chemistry of transition elements	Nil	
2	Oct.	1&2	7	3	Chemistry of transition elements	3	Chemistry of transition elements	Nil	
		3&4	10	6	Chemistry of f-block elements Lanthanides	6	Chemistry of f-block elements Lanthanides	Nil	
		5	6	3	Actinides	3	Actinides	Nil	
3	Nov.	1&2	10	6	Metals Semiconductors and superconductors	6	Metals Semiconductors and superconductors	Nil	
		3&4	11	6	Metals Semiconductors and superconductors	6	Metals Semiconductors and superconductors	Nil	

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Signature of Faculty Incharge

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TEACHING AND EVALUATION PLAN

Name of the teacher Mr. Nanaware R.M. Year: 2021-22 Semester: II

Subject: Chemistry Paper Inorganic Chemistry CH-605 Class: T.Y.B.Sc.

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods available	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
1	Jan	1&2	07	4	Ionic solids Crystal structures SC,BCC, FCC, Close packing. Tetrahedral and octahedral voids	4	Ionic solids Crystal structures SC,BCC, FCC, Close packing. Tetrahedral and octahedral voids	Nil	
		3&4	12	6	Bon Haber cycle, Stoichiometric defects. Ionic radius	6	Bon Haber cycle, Stoichiometric defect's. Ionic radius	Nil	
		5	5	3	Acid-Bases and Donor-acceptor Chemistry	3	Acid-Bases and Donor-acceptor Chemistry	Nil	
2	Feb	1&2	11	6	Acid-Bases and Donor-acceptor Chemistry	6	Acid-Bases and Donor-acceptor Chemistry	Nil	
		3&4	11	6	Introduction to Nano chemistry	6	Introduction to Nano chemistry	Nil	
3	March	1&2	10	5	Chemical Toxicology	5	Chemical Toxicology	Nil	
		3&4	11	3	Chemistry of zeolites	03	Chemistry of zeolites	Nil	
		5	4	2	Chemistry of zeolites	2	Chemistry of zeolites	Nil	

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TEACHING AND EVALUATION PLAN

Name of the teacher: Dr. Bhosale R.R	**Year:** 2021-2022	**Semester:** I
Subject: Physical Chemistry	**Paper:** I CH- 101	**Class:** F. Y. B. Sc.

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods available	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
1	July2021	3 & 4	9	6	**Chemical Energetics:** Important principles of thermochemistry. Concept of standard state and standard enthalpies,	6	**Chemical Energetics:** Important principles of thermochemistry. Concept of standard state and standard enthalpies,	Nil	--
2	Aug 2021	1& 2	12	6	Calculation of bond energy, bond dissociation energy, Kirchhoff's equation. Statement of Third Law of thermodynamics ,problems	6	Calculation of bond energy, bond dissociation energy, Kirchhoff's equation. Statement of Third Law of thermodynamics ,problems	1	Extra lecture was conducted on sunday
3	Aug. 2021	3 & 4	11	6	**Chemical Equilibrium:** Free Energy and equilibrium - Concept, Definition and significance, response of equilibria to conditions- response to pressure , response to temperature,	6	**Chemical Equilibrium:** Free Energy and equilibrium - Concept, Definition and significance, response of equilibria to conditions- response to pressure , response to temperature,	Nil	----
4	Sept. 2021	1 &2	11	6	The perfect gas equilibrium, Van't Haff equation, Value of K at different temperature, Problems	6	The perfect gas equilibrium, t. Van't Haff equation, Value of K at different temperature, Problems	1	Extra lecture was conducted
5	Sept. 2021	3 & 4	12	6	**Ionic Equilibria:** Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant,	6	**Ionic Equilibria:** Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant,	Nil	---

Semester I **Paper: I CH-101** **Year : 2021-2022**

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods available	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
6	Oct. 2021	1 & 2	11	6	Ionization of weak acids and bases, pH scale, common ion effect. Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions.	6	Ionization of weak acids and bases, pH scale, common ion effect. Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions.	Nil	--
7	Oct. 2021	3 &4	11	6	Solubility and solubility product of sparingly soluble salts– applications of solubility product principle.	6	Solubility and solubility product of sparingly soluble salts– applications of solubility product principle.	4	Extra lecture was conducted

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INDAPUR-413106 DIST-PUNE

Arts, Science and Commerce College, Indapur, Dist. Pune

TEACHING AND EVALUATION PLAN

Name of the teacher: Dr. Bhosale R.R	**Year:** 2021-2022	**Semester:** II
Subject: Analytical Chemistry	**Paper:** I CH- 202	**Class:** F. Y. B. Sc.

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods available	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
1	Non.2021	3 & 4	9	6	**Introduction to Analytical Chemistry: Calculations used in Analytical Chemistry**: mole, millimole and Calculations, significant figures	6	**Introduction to Analytical Chemistry: Calculations used in Analytical Chemistry**: mole, millimole and Calculations, significant figures	Nil	--
2	Dec. 2021	1& 2	12	6	Solution and their concentrations- Chemical Stoichiometry – Empirical and Molecular Formulas, Problems.	6	Solution and their concentrations- Chemical Stoichiometry – Empirical and Molecular Formulas, Stoichiometric Calculations, Problems.	1	Extra lecture was conducted
3	Dec. 2021	3 & 4	11	6	**Qualitative Analysis of Organic Compounds:** binary mixtures, Lassiagen's test. Purification- recrystallization, distillation, sublimation	6	**Qualitative Analysis of Organic Compounds:** binary mixtures, Lassiagen's test. Purification recrystallization, distillation, sublimation	Nil	----
4	Jan. 2022	1 &2	11	6	**Chromatographic Techniques –** Paper and Thin Layer, IUPAC definition of chromatography.	6	**Chromatographic Techniques** –Paper and Thin Layer ,IUPAC definition of chromatography	1	Extra lecture was conducted
5	Jan. 2022	3 & 4	12	6	Paper, Thin Layer, Ion exchange , Gas permeation, affinity, Gas, Supercritical fluid, HPLC,	6	Paper, Thin Layer, Ion exchange , Gas permeation, affinity, Gas, Supercritical fluid, HPLC,	Nil	---

Semester II **Paper: I CH-202** **Year : 2021-2022**

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods available	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
6	Feb. 2022	1 & 2	11	6	Thin Layer Chromatography: Theory and principles, Paper Chromatography- technique, sample preparation, types of paper, solvents	6	Thin Layer Chromatography: Theory and principles, Paper Chromatography- technique, sample preparation, types of paper, solvents	Nil	--
7	Feb. 2022	3 &4	11	6	**pH meter:** pH meter, Glass pH electrode, combination of pH electrode-Complete Cell, Standard Buffer ,pH measurement, How does it works? Applications.	6	**pH meter:** pH meter, Glass pH electrode, combination of pH electrode-Complete Cell, Standard Buffer, pH measurement, How does it works? Applications.	---	----

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Signature of Teacher

Signature of Head of Department

Head
Department Of Chemistry
Arts,Science & Commerce
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Signature of Faculty In-charge

Incharge
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TEACHING AND EVALUATION PLAN

Name of the teacher: Dr. Bhosale R.R **Year:** 2021-2022 **Semester:** V

Subject: Environmental Chemistry **Paper:** I CH-511A **Class:** T. Y. B. Sc.

Part I: Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods available	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
1	Nov 2021	1 & 2	12	6	**Concepts and Scope:** Environmental Pollution and Classification, their Segments, Biogeochemical cycles of C, N, P, S and O system.	6	**Concepts and Scope:** Environmental Pollution and Classification, their Segments, Biogeochemical cycles of C, N, P, S and O system.	Nil	--
2	Nov. 2021	3&4	12	6	Hydrosphere and Water Pollution Hydrological Cycle : Classification of water pollutants,	6	Hydrosphere and Water Pollution Hydrological Cycle : Classification of water pollutants, water quality parameters.	Nil	Extra lecture was conducted on sunday
3	Dec. 2021	1 &2	12	6	Eutrophication, Sampling and monitoring water quality parameters: pH, D.O, COD, TOC, TH, free chlorine.	6	Eutrophication, Sampling and monitoring water quality parameters: pH, D.O, COD, TOC, TH, free chlorine.	Nil	----
4	Dec. 2021.	3 &4	12	6	**Analytical Techniques in water Analysis:** domestic water quality parameters, Cr, Cu, Fe, Pb, Mn, Hg (Exclude polarographic and AAS methods), COD, BOD, TOC,	6	**Analytical Techniques in water Analysis:** domestic water quality parameters, Cr, Cu, Fe, Pb, Mn, Hg (Exclude polarographic and AAS methods), COD, BOD, TOC,	Nil	Extra lecture was conducted
5	Jan. 2022	1&2	12	6	phenols, pesticides, surfactants, tannis and lignins, E. Coli,	6	phenols, pesticides, surfactants, tannis and lignins, E. Coli,	Nil	---

Semester I **Paper: I CH-511A** **Year: 2021-2022**

Part I: Teaching Plan						Part II: Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods available	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
6	Jan. 2022	3 &4	12	6	**Water pollution and treatment methods:** Water pollutants, Eutrophication, Waste water industrial waste water treatment, drinking water supplies, Trace elements in water, chemical speciation (Cu, Pb, Hg, As, Se, Cr)	10	**Water pollution and treatment methods:** Water pollutants, Eutrophication, Waste water industrial waste water treatment, drinking water supplies, Trace elements in water, chemical speciation (Cu, Pb, Hg, As, Se, Cr)	+4	Extra lecture

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TEACHING AND EVALUATION PLAN

Name of the teacher: Dr. Bhosale R.R	**Year: 2021-2022**	**Semester: VI**
Subject: Physical Chemistry-III	**Paper: CH-602**	**Class: T. Y. B. Sc.**

Part I : Teaching Plan						**Part II : Evaluation of Plan**			
1	2	3	4	5	6	7	8	9	10
Sr. No.	**Month**	**Week**	**No. of working days**	**No. of periods available**	**Topics to be taught**	**No. of periods engaged**	**Topics taught**	**Deviation in periods**	**Remarks**
1	March 2022	2 &3	12	6	**Colligative properties of dilute solutions:** Solution, electrolytes and nonelectrolytes, Colligative properties.	6	**Colligative properties of dilute solutions:** Solution, electrolytes and nonelectrolytes, Colligative properties.	Nil	----
2	March 2022	4& 5	11	6	Relation between Vant Hoff's factor and degree of dissociation, **Kinetics of Reactions in the Solid State:** Factors affecting, Rate Laws,	6	Relation between Vant Hoff's factor and degree of dissociation, **Kinetics of Reactions in the Solid State:** Factors affecting, Rate Laws,	Nil	-----
3	April. 2022	1 & 2	12	6	Applying Rate Laws, Results of Some Kinetic Studies, The Deaquation-Anation of [Co (NH3)5H2O]Cl3,	6	Applying Rate Laws, Results of Some Kinetic Studies, The Deaquation-Anation of [Co(NH3)5H2O]Cl3,	Nil	------
4	May. 2022	1 &2	12	6	**Electronic structure and macroscopic properties:** electronic structure of solids, conductors and insulators,	10	**Electronic structure and macroscopic properties:** electronic structure of solids, conductors and insulators, Ionic crystals, semiconductors, cohesive energy in metals.	4	Extra lecture
5	May. 2022	3 &4	12	6	Ionic crystals, semiconductors, cohesive energy in metals. **Polymres:**	10	**Polymers:** Polymer definition, Preparation, Classification, bonding & Molecular forces,	4	Extra lecture

Semester VI **Paper: I CH-602** **Year : 2021-2022**

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods available	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
6	May 2022	1,2 &3,4	----	---		6	Molecular weights of polymers: Molecular weight & degree of polymerisation, Practical significance of polymer molecular weights.	6	Extra lecture was conducted

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Teacher name: Sachin D.Kharat **Year : 2021-2022** **Class: T.Y.B.Sc** **Semester I** **Paper: CH-510 (B) : Polymer Chemistry**

Part I : Teaching Plan						Part II : Evaluation of Plan			
1	2	3	4	5	6	7	8	9	10
Sr. No.	Month	Week	No. of working days	No. of periods available	Topics to be taught	No. of periods engaged	Topics taught	Deviation in periods	Remarks
1	Nov 2021	3 & 4	11	6	Introduction and history of polymeric materials	6	Introduction and history of polymeric materials	Nil	--
2	Dec 2021	1 &2	11	5	Polymerization Chemistry	6	Polymerization Chemistry	1	Extra lecture was conducted
3	Jan. 2022	1 &2	12	6	Polymerization Chemistry Molecular weight of Polymers	6	Polymerization Chemistry Molecular weight of Polymers	Nil	--
4	Jan 2022	3 &4	12	6	Important Polymers	6	Important Polymers		--
5	Feb 2022	1 &2	12	5	Important Polymers	5	Important Polymers	Nil	

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TEACHING AND EVALUATION PLAN

Name of the teacher: Sachin D. Kharat	**Year: 2021-2022**	**Semester: II**
Subject: Analytical Chemistry -II	**Paper: CH-611(A)**	**Class: T.Y. B.Sc**

Part I : Teaching Plan						**Part II : Evaluation of Plan**			
1	2	3	4	5	6	7	8	9	10
Sr. No.	**Month**	**Week**	**No. of working days**	**No. of periods available**	**Topics to be taught**	**No. of periods engaged**	**Topics taught**	**Deviation in periods**	**Remarks**
1	March 2022	3 & 4	9	6	Solvent extraction Instrumental Methods of Chromatographic Analysis	6	Solvent extraction Instrumental Methods of Chromatographic Analysis	Nil	--
2	April 2022	1& 2	12	6	High Performance Liquid Chromatography	6	High Performance Liquid Chromatography	Nil	--
3	April 2021	3 & 4	11	5	Gas Chromatography	6	Gas Chromatography	1	Extra lecture was conducted on sunday
4	May 2022	1 &2	11	6	Atomic Absorption Spectroscopy	6	Atomic Absorption Spectroscopy	Nil	--
5	May 2022	3 & 4	12	6	Flame Emission Spectroscopy	6	Flame Emission Spectroscopy	Nil	--

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