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

TEACHING AND EVALUATION PLAN

Name of the teacher: Prof. Mane U.L	**A. Year:** 2019-2020		**Semester:** III
Subject: Physical Chemistry	**Paper:** IV CH-331	**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	August 2019	2,3 & 4	10	10	**Chemical Kinetics : [10 L]** Recapitulation of Chemical Kinetics, Third order reaction, Derivation of integrated rate law for third order reaction with equal initial concentration, characteristics of third order reaction, examples of third order reaction, Methods to determine order of reaction using Integrated rate equation method, Graphical method, Half-life method, Differential method. Effect of temperature on reaction rate, Arrhenius equation, related numerical.	10	**Chemical Kinetics : [10 L]** Recapitulation of Chemical Kinetics, Third order reaction, Derivation of integrated rate law for third order reaction with equal initial concentration, characteristics of third order reaction, examples of third order reaction, Methods to determine order of reaction using Integrated rate equation method, Graphical method, Half-life method, Differential method. Effect of temperature on reaction rate, Arrhenius equation, related numerical.	Nil	--
2	Septem ber 2019	1,2,3 &4	14	14	**2. Electrolytic Conductance: [14 L]** Recapitulation of Electrolytic conductance,Specific and equivalent conductance,Variation of equivalent conductance with concentration,	14	**2. Electrolytic Conductance: [14 L]** Recapitulation of Electrolytic conductance,Specific and equivalent conductance,Variation of equivalent conductance with concentration, Kohlrausch's law and its applications	Nil	--

					Kohlrausch's law and its applications to determine a. Equivalent conductance at infinite dilution of a weak electrolyte, b. The ionic product of water, c. Solubility of sparingly soluble salts, Migration of ions and ionic mobilities, absolute velocity of ions, Transport number determination by Hittorf's method and moving boundary method, Relation between ionic mobility, ionic conductance and transport number, Ionic theory of conductance, Debye-Huckel – Onsager equation and its validity, Activity in solution, fugacity and activity coefficient of strong electrolyte.		to determine a. Equivalent conductance at infinite dilution of a weak electrolyte, b. The ionic product of water, c. Solubility of sparingly soluble salts, Migration of ions and ionic mobilities, absolute velocity of ions, Transport number determination by Hittorf's method and moving boundary method, Relation between ionic mobility, ionic conductance and transport number, Ionic theory of conductance, Debye-Huckel –Onsager equation and its validity, Activity in solution, fugacity and activity coefficient of strong electrolyte.		
3	October 2019	1 &2	16	16	**3. Investigations of Molecular Structure: [16 L]** Molar refraction, Electrical polarization of molecules, Permanent dipole moment, Determination of dipole moment, Molecular spectra - Rotational, vibrational and Raman spectra Reference	16	**3. Investigations of Molecular Structure: [16 L]** Molar refraction, Electrical polarization of molecules, Permanent dipole moment, Determination of dipole moment, Molecular spectra - Rotational, vibrational and Raman spectra Reference	Nil	--
4	January 2021	3 & 4	08	8	**4. Phase Rule: [08 L]** Definitions, Gibb's phase rule, one component system (moderate pressure only) for sulphur and water system, two component system for silver-lead and zinc-	8	**4. Phase Rule: [08 L]** Definitions, Gibb's phase rule, one component system (moderate pressure only) for sulphur and water system, two component system for silver-lead and zinc-	Nil	--

					cadmium.		cadmium.		

Semester IV Paper: IV CH-341 Year : 2019-2020

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	December 2019	1,2,3 & 4	14	14	**1. Electrochemical Cells [14 L]** Reversible and irreversible cells,EMF and its measurements,Standard cells, cell reaction and EMF,Single electrode potential and its calculation,Calculation of cellEMF,Thermodynamics of cell EMF,Types of electrodes,Classification of electrochemical cells with and without transference,Applications of EMFmeasurement-i)Solubility product of sparingly soluble salt,ii)Determination of pH,iii)Potentiometric titration	14	**1. Electrochemical Cells [14 L]** Reversible and irreversible cells,EMF and its measurements,Standard cells, cell reaction and EMF,Single electrode potential and its calculation,Calculation of cellEMF,Thermodynamics of cell EMF,Types of electrodes,Classification of electrochemical cells with and without transference,Applications of EMFmeasurement-i)Solubility product of sparingly soluble salt,ii)Determination of pH,iii)Potentiometric titration	Nil	--
2	January 2020	1,2,3 ,& 4	12	12	**2. Nuclear Chemistry [12 L]** The atom, nucleus and outer sphere, classification of nuclides, nuclear stability and binding	12	**2. Nuclear Chemistry [12 L]** The atom, nucleus and outer sphere, classification of nuclides, nuclear stability and binding	0	

					energy.Discovery of radioactivity, types of radioactivity, general characteristics of radioactive decay and decay kinetics,Measurements radioactivity, gaseous ion collection method, proportional and G.M. counter.		energy.Discovery of radioactivity, types of radioactivity, general characteristics of radioactive decay and decay kinetics,Measurements radioactivity, gaseous ion collection method, proportional and G.M. counter.		
3	Februar y 2020	1,2,3 ,& 4	12	12	**3. Crystal structure [12 L]** Crystallization and fusion process,Crystallography, Crystal systems,-Properties of crystals, Crystal lattice and unit cell,-Crystal structure analysis by X ray - The Laue method and Braggs method, - X-ray analysis of NaCl crystal system, - Calculation of d and λ for a crystal system.	12	**3. Crystal structure [12 L]** Crystallization and fusion process,Crystallography, Crystal systems,-Properties of crystals, Crystal lattice and unit cell,-Crystal structure analysis by X ray - The Laue method and Braggs method, - X-ray analysis of NaCl crystal system, - Calculation of d and λ for a crystal system.		
4	March 2020	1,2& 3	10	10	**4. Quantum Chemistry [10 L]** Concept of quantization, atomic spectra (no derivation), wave particle duality, uncertainty principle, wavefunction and its interpretation, well-behaved function, Hamiltonian (energy) operator, formulation of Schrodinger equation, particle in box (1D, 2D and 3D box) (no derivations), sketching of wavefunction and probability densities for 1D box, correspondence principle, degeneracy(lifting of degeneracy), applications to conjugated systems, harmonic	10	**4. Quantum Chemistry [10 L]** Concept of quantization, atomic spectra (no derivation), wave particle duality, uncertainty principle, wavefunction and its interpretation, well-behaved function, Hamiltonian (energy) operator, formulation of Schrodinger equation, particle in box (1D, 2D and 3D box) (no derivations), sketching of wavefunction and probability densities for 1D box, correspondence principle, degeneracy(lifting of degeneracy), applications to conjugated systems, harmonic oscillator, wavefunction and probability densities (no derivation), zero point		--

					oscillator, wavefunction and probability densities (no derivation), zero point energy and quantum tunneling.		energy and quantum tunneling.		

1 The plan should be prepared in duplicate.
2 One copy of the plan should be submitted at the beginning of the term after filling up columns 1 to 6.
3 The second copy must be retained by the teacher and submitted at the end of the term. Part second of the plan i. e. coumns 7 to 10 must be filled up progressively at the end of every week.

Signature of Teacher

Signature of Head of Department

Head
Department Of Chemistry
Arts,Science & Commerce
College,Indapue,Dist.Pune

Signature of Faculty In-charge

Incharge
Science Faculty
Arts,Science & Commerce
College,Indapur, Dist.Pune

Signature of the Principal

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Arts, Science and Commerce College, Indapur, Dist. Pune
TEACHING AND EVALUATION PLAN

Name of the teacher: Prof . Mane U.L	**A. Year:** 2019-2020		**Semester:** III
Subject: Physical & Analytical Chemistry		**Paper:** I CH-211	**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	August 2019	2,3 & 4	10	10	Chapter 1: Elementary Chemical Kinetics [10] Introduction to Chemical kinetics, molecularity and order of reaction , reaction rates, rate laws, rate constant and its significance, Integrated rate law expression and its characteristics–first order, second order (single reactant, two reactants involved), examples of 1st and 2nd order reaction, pseudomolecular	10	Chapter 1: Elementary Chemical Kinetics [10] Introduction to Chemical kinetics, molecularity and order of reaction , reaction rates, rate laws, rate constant and its significance, Integrated rate law expression and its characteristics–first order, second order (single reactant, two reactants involved), examples of 1st and 2nd order reaction, pseudomolecular reactions, factors affecting rate of	Nil	--

					reactions, factors affecting rate of reaction, measurement of rate of reaction, numericals		reaction, measurement of rate of reaction, numericals		
2	Septem ber 2019	1,2,3 &4	14	14	**Chapter 2: Photochemistry [10]** Introduction, thermal reactions and photochemical reactions, laws of photochemistry, quantum yield, measurement of quantum yield, types of photochemical reactionsphotosynthesis, photolysis, photocatalysis, photosensitization, photophysical process– fluorescence, phosphorescence, quenching, chemiluminiscence, numericals. **Chapter 3: Distribution law [04]** Nernst distribution law, Statement and thermodynamic proof for Nernst distribution law, association and dissociation of solute in solvent, application of distribution law, Numericals.	14	**Chapter 2: Photochemistry [10]** Introduction, thermal reactions and photochemical reactions, laws of photochemistry, quantum yield, measurement of quantum yield, types of photochemical reactionsphotosynthesis, photolysis, photocatalysis, photosensitization, photophysical process– fluorescence, phosphorescence, quenching, chemiluminiscence, numericals. **Chapter 3: Distribution law [04]** Nernst distribution law, Statement and thermodynamic proof for Nernst distribution law, association and dissociation of solute in solvent, application of distribution law, Numericals.	Nil	--
3	October 2019	1,2 & 3	12	12	**Chapter 4: Introduction to Analytical Chemistry [3]** Introduction, Chemical analysis, applications of chemical analysis, sampling, types of analysis, Common techniques, Instrumental methods, other techniques, factors affecting on choice of method. Chapter 5: Errors in Quantitative Analysis [5] Introduction, Error, Accuracy, precision, methods of expressing accuracy and precision, classification of errors, significant figures and computations, distribution of	16	**Chapter 4: Introduction to Analytical Chemistry [3]** Introduction, Chemical analysis, applications of chemical analysis, sampling, types of analysis, Common techniques, Instrumental methods, other techniques, factors affecting on choice of method. Chapter 5: Errors in Quantitative Analysis [5] Introduction, Error, Accuracy, precision, methods of expressing accuracy and precision, classification of errors, significant figures and computations, distribution of random errors, mean	04	Four Extra Lecs taken

					random errors, mean and standard deviations, reliability of results, Numericals. **Chapter 6: Inorganic Qualitative Analysis [8]** Basic principle, common ion effect, solubility, solubility product, preparation of original solution, classification of basic radicals in groups, separation of basic radicals, removal of interfering anions (phosphate and borate), detection of acid radicals.		and standard deviations, reliability of results, Numericals. **Chapter 6: Inorganic Qualitative Analysis [8]** Basic principle, common ion effect, solubility, solubility product, preparation of original solution, classification of basic radicals in groups, separation of basic radicals, removal of interfering anions (phosphate and borate), detection of acid radicals.		
4	Novemb er 2019	1 & 2	08	08	**Chapter 7: Analysis of Organic Compounds (Qualitative & Quantitative) [8]** I. Qualitative A. Types of organic compounds, Characteristic tests and classifications, reactions of different functional groups, analysis of binary mixtures. II Quantitative B. Analysis– estimation of C, H, (O) by combustion tube, detection of nitrogen, sulfur, halogen and phosphorous by Lassigen's test. C. Estimation of nitrogen by Dumas's Kjeldahl's method, estimation of halogen, sulphur and phosphate by Carious method. D. Determination of empirical and molecular formula, numerical problems.	08	**Chapter 7: Analysis of Organic Compounds (Qualitative & Quantitative) [8]** I. Qualitative A. Types of organic compounds, Characteristic tests and classifications, reactions of different functional groups, analysis of binary mixtures. II Quantitative B. Analysis–estimation of C, H, (O) by combustion tube, detection of nitrogen, sulfur, halogen and phosphorous by Lassigen's test. C. Estimation of nitrogen by Dumas's Kjeldahl's method, estimation of halogen, sulphur and phosphate by Carious method. D. Determination of empirical and molecular formula, numerical problems.	Nil	

Semester IV | Paper: I CH-221 | Year : 2019-2020

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	December 2019	2,3 & 4	09	09	**1 1Chapter 1: Free Energy and Equilibrium [12]** Introduction, Helmholtz free energy, variation of Helmholtz free energy with volume and temperature, Helmholtz free change energy for chemical reaction,Gibb's free energy, Variation of Gibb's free energy with pressure and temperature, Gibb's free energy change for chemical reaction, Free energy change for physical transitions, Free energy change for an ideal gas; standard free energy change, Gibb's-Helmholtz equation, Properties and significance of Gibb's free change, Van't Hoff reaction isotherm, thermodynamic equilibrium constants, Relation between Kp and Kc for gaseous reactions, variation of equilibrium constant with temperature, Criteria for chemical equilibrium, Physical equilibrium, Clapeyron equation, Clausius–Clapeyron equation, Application of Clausius– Clapeyron equation, numericals.	12	**1 1Chapter 1: Free Energy and Equilibrium [12]** Introduction, Helmholtz free energy, variation of Helmholtz free energy with volume and temperature, Helmholtz free change energy for chemical reaction,Gibb's free energy, Variation of Gibb's free energy with pressure and temperature, Gibb's free energy change for chemical reaction, Free energy change for physical transitions, Free energy change for an ideal gas; standard free energy change, Gibb's-Helmholtz equation, Properties and significance of Gibb's free change, Van't Hoff reaction isotherm, thermodynamic equilibrium constants, Relation between Kp and Kc for gaseous reactions, variation of equilibrium constant with temperature, Criteria for chemical equilibrium, Physical equilibrium, Clapeyron equation, Clausius–Clapeyron equation, Application of Clausius– Clapeyron equation, numericals.	03	3 Extra Lectures are taken.

2	January 2020	1,2,3 ,& 4	12	12	Chapter 2: Solutions of Liquids In Liquids [12] Types of solutions, Ideal solutions, Raoult's law, ideal and non ideal solutions, Henry's law, Application of Henry's law with example CS2 in acetone, problems based on Raoult's law and Henry's law, vapor pressure–composition diagram of ideal and non ideal solution, temperature composition diagram of miscible binary solutions, distillation from temperature–composition diagram, Azeotropes, Partially immiscible liquids.	12	Chapter 2: Solutions of Liquids in Liquids [12] Types of solutions, Ideal solutions, Raoult's law, ideal and non ideal solutions, Henry's law, Application of Henry's law with example CS2 in acetone, problems based on Raoult's law and Henry's law, vapor pressure–composition diagram of ideal and non ideal solution, temperature composition diagram of miscible binary solutions, distillation from temperature–composition diagram, Azeotropes, Partially immiscible liquids.	00	
3	Februar y 2020	1,2,3 ,& 4	12	12	**Chapter 3: Introduction to volumetric analysis [6]** Introduction, methods of expressing concentrations, primary and secondary standard solutions. Apparatus used and their calibration: burettes, microburettes, volumetric pipettes, graduated pipettes, volumetric flask, methods of calibration, Instrumental & noninstrumental analysis – principles & types. Chapter 4: Non Instrumental volumetric analysis [18] Indicators–theory of indicators, acid base indicators, mixed and universal indicators [3] Acid–Base titrations: Strong acid–Strong base, Weak acid–strong base, Weak acid-Weak base titration, Displacement titrations, polybasic acid titrations. (Discuss	15	**Chapter 3: Introduction to volumetric analysis [6]** Introduction, methods of expressing concentrations, primary and secondary standard solutions. Apparatus used and their calibration: burettes, microburettes, volumetric pipettes, graduated pipettes, volumetric flask, methods of calibration, Instrumental & noninstrumental analysis – principles & types. Chapter 4: Non Instrumental volumetric analysis [18] Indicators–theory of indicators, acid base indicators, mixed and universal indicators [3] Acid–Base titrations: Strong acid–Strong base, Weak acid–strong base, Weak acid-Weak base titration, Displacement titrations, polybasic acid titrations. (Discuss titration with respect to neutralization and equivalence point determination and limitations)	03	03 Extra Lectures taken

					titration with respect to neutralization and equivalence point determination and limitations)				
04	March 2019	1,2	06	06	Redox titrations: Principle of redox titration, detection of equivalence point using suitable indicators. [3] Complexometric titrations: Principle, EDTA titrations, choice of indicators [6] Iodometry and Iodimetry: Principle, detection of end point, difference between iodometry and iodimetry, Standardization of sodium thiosulphate solution using potassium dichromate and iodine method, Applications – estimation of Cu , estimation of Cl2.	09	Redox titrations: Principle of redox titration, detection of equivalence point using suitable indicators. [3] Complexometric titrations: Principle, EDTA titrations, choice of indicators [6] Iodometry and Iodimetry: Principle, detection of end point, difference between iodometry and iodimetry, Standardization of sodium thiosulphate solution using potassium dichromate and iodine method, Applications – estimation of Cu , estimation of Cl2.	03	03 Extra Lectures taken

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Signature of Teacher

Signature of Head of Department

Head
Department Of Chemistry
Arts,Science & Commerce
College,Indapue,Dist.Pune

Signature of Faculty In-charge

Incharge
Science Faculty
Arts,Science & Commerce
College,Indapur, Dist.Pune

Signature of the Principal

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TEACHING AND EVALUATION PLAN

Name of the teacher: Prof Bhore J.B.				Semester: II			Year: 2019-2020		
Subject: Organic Chemistry				CHO-333			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	July2019	3&4	7	04	Strength of organic acids and bases (03) Introduction,*pka*, origin of acidity, influence of solvent, simple aliphatic saturated and unsaturated acids,	04	Strength of organic acids and bases (03) Introduction,*pka*, origin of acidity, influence of solvent, simple aliphatic saturated and unsaturated acids,	Nil	-
1	Aug 2019	1&2	11	08	2. Stereochemistry of disubstituted cyclohexane 1,1-alkyl disubstituted cyclohexane; Dimethyl cyclohexane 1,2; 1,3 and 1,4.Geometrical isomerism, Optical isomerism, stability of conformation, energy 3. Nucleophilic substitution at aliphatic Carbon SN1 reaction: Kinetics, mechanism and stereochemistry SN2 reaction: Kinetics, mechanism & stereochemistry (inversion).	08	2. Stereochemistry of disubstituted cyclohexane 1,1-alkyl disubstituted cyclohexane; Dimethyl cyclohexane 1,2; 1,3 and 1,4.Geometrical isomerism, Optical isomerism, stability of conformation, energy 3. Nucleophilic substitution at aliphatic Carbon SN1 reaction: Kinetics, mechanism and stereochemistry SN2 reaction: Kinetics, mechanism & stereochemistry (inversion).	Nil	-
2	Aug 2019	3&4	11	08	Ozonolysis (formation of aldehydes & ketones) addition of Hydrogencyanide, alcohols, thiols, water, ammonia derivatives, Cannizzaro and Reformaski reactions	08	Ozonolysis (formation of aldehydes & ketones) addition of Hydrogencyanide, alcohols, thiols, water, ammonia derivatives, Cannizzaro and Reformaski reactions	Nil	-
3	Sept 2019	1&2	11	08	5. Elimination Reactions (06) Introduction; 1,1: 1,2 elimination,E1, E2 and E1cB mechanism with evidences, Hoffmann andSaytzeff's elimination, reactivity effect of structure, attacking and leaving groups.	08	5. Elimination Reactions (06) Introduction; 1,1; 1,2 elimination.E1, E2 and E1cB mechanism with evidences, Hoffmann andSaytzeff's elimination, reactivity effect of structure, attacking and leaving groups.	Nil	-
	Sept 2019	3&4	11	08	6. Aromatic Electrophilic and Nucleophilic substitution reactions (10) Introduction, arenium ion mechanism, Effect of substituent group (Orientation, o/p directing andmeta directing groups activating and deactivating groups)	08	6. Aromatic Electrophilic and Nucleophilic substitution reactions (10) Introduction, arenium ion mechanism, Effect of substituent group (Orientation, o/p directing andmeta directing groups activating and deactivating groups)	Nil	-
	Oct.2019	1&2	11	08	Mechanism of – Nitration, Sulfonation, Halogenation, Fridel-Crafts reactions, Diazo Couplingreactions, Ipso-substitution.Addition-elimination (SNAr),	08	Mechanism of – Nitration, Sulfonation, Halogenation, Fridel-Crafts reactions, Diazo Couplingreactions, Ipso-substitution.Addition-elimination (SNAr),	Nil	-
	Oct. 2019	3&4	11	08	SN1, Elimination-addition (Benzyne)	08	SN1, Elimination-addition (Benzyne)	Nil	-
	Nov. 2019	1&2	11	04	SNR1reactions, reactivity	04	SNR1reactions, reactivity	Nil	-

Sign. of Teacher **Sign. of Head of Department** **Sign. of Faculty In-charge** **Sign. of the Principal**

Department of Chemistry Arts,Science & Commerce College,Indapur,Dist.Pune

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

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

TEACHING AND EVALUATION PLAN

Name of the teacher: Prof Bhore J.B. Year: 2019-2020
Semester: I
Subject: Organic Chemistry CHO-102 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	July2019	3&4	11	04	Fundamentals of Organic Chemistry .	4	Fundamentals of Organic Chemistry .	Nil	--
2	Aug 2019		11	04	Reactive Intermediates: Carbocations, Carbanions and free radicals. Strength of organic acids and bases:	4	Reactive Intermediates: Carbocations, Carbanions and free radicals. Strength of organic acids and bases:	Nil	--
3	Aug 2019	3&4	11	04	Conformations with respect to ethane, butane and cyclohexane.	4	Conformations with respect to ethane, butane and cyclohexane.	Nil	--
	Sept 2019	1&2	11	04	Aliphatic Hydrocarbons Functional group .	4	Aliphatic Hydrocarbons Functional group	Nil	--
	Sept 2019	3&4	11	04	**Alkenes:**Carbons)*Preparation:* Elimination reactions: Dehydration of alkenes	3	**Alkenes:** Carbons)*Preparation:* Elimination reactions: Dehydration of alkenes	Nil	-
	Oct.2019	1&2	11	04	(alk. KMnO4) and trans-addition (bromine), Addition of HX (Markownikoff's and anti-Markownikoff's addition), Hydration, Ozonolysis, oxymecuration-demercuration, Hydroboration-oxidation.	4	(alk. KMnO4) and trans-addition (bromine), Addition of HX (Markownikoff's and anti-Markownikoff's addition), Hydration, Ozonolysis, oxymecuration-demercuration, Hydroboration-oxidation.	Nil	-
	Oct. 2019	3&4	11	04	Alkynes-	4	Alkynes:	Nil	-
	Nov.2019	1&2	11	04	*Reactions:* formation of metal acetylides, addition of bromine and alkaline KMnO4, ozonolysis and oxidation with hot alk. KMnO4.	2	*Reactions:* formation of metal acetylides, addition of bromine and alkaline KMnO4, ozonolysis and oxidation with hot alk. KMnO4.	Nil	-

Sign. of Teacher

Sign. of Head of Department
Department of Chemistry
Arts,Science & Commerce
College,Indapur,Dist.Pune

Sign. of Faculty In-charge
Arts,Science & Commerce
College,Indapur, Dist.Pune

Sign of the Principal
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Arts, Science and Commerce College, Indapur, Dist. Pune
TEACHING AND EVALUATION PLAN

Name of the teacher: Dr. M. P. Shinde **Year:** 2019-2020
Semester: I
Subject: Analytical Chemistry **Paper:** IV CH-334 **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: IV CH-344** **Year : 2019-2020**

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: Dr. Bhosale R.R	**Year: 2019-2020**	**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	July2020	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 2020	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. 2020	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 : 2019-2020**

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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TEACHING AND EVALUATION PLAN

Name of the teacher: Dr. Bhosale R.R	**Year:** 2019-2020	**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.2020	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. 2020	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. 2020	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. 2021	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. 2021	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 : 2019-2020**

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. 2021	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. 2021	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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TEACHING AND EVALUATION PLAN

Name of the teacher: Dr. Bhosale R.R	**Year: 2019-2020**	**Semester: III**
Subject: Agriculture Chemistry	**Paper: I CH-336E**	**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	July2019	3 & 4	9	6	**Soil Chemistry:** Role, Scope and importance of agricultural chemistry Definition of soil, Soil components- mineral component, Physical properties of soil	6	**Soil Chemistry:** Role, Scope and importance of agricultural chemistry Definition of soil, Soil components- mineral component, Physical properties of soil	Nil	--
2	Aug 2019	1& 2	12	6	Chemical properties of soil, Factor controlling soil rea **Problematic Soil and Soil testing:** Acid soil, Alkali Soil	6	Chemical properties of soil, Factor controlling soil rea **Problematic Soil and Soil testing:** Acid soil, Alkali Soil	Nil	--
3	Aug. 2019	3 & 4	11	6	Classification of alkali soil, Introduction to soil testing, Objectives of soil testing	6	Classification of alkali soil, Introduction to soil testing, Objectives of soil testing	Nil	----
4	Sept. 2019	1 &2	11	6	**Quality of Irrigation Water:** Sources of Water, Impurities in Water, Water quality, Analysis of irrigation Water Dissolved constituents and their functions.	6	**Quality of Irrigation Water:** Sources of Water, Impurities in Water, Water quality, Analysis of irrigation Water Dissolved constituents and their functions.	Nil	-----
5	Sept. 2019	3 & 4	12	6	Water quality standard- TSS, SAR, Exchange sodium ESP),RSC, salinity classes for irrigation water.	6	Water quality standard- TSS, SAR, Exchange sodium ESP),RSC, salinity classes for irrigation water.	Nil	---

Semester I **Paper: I CH- CH-336E** **Year : 2019-2020**

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. 2019	1 & 2	11	6	**Plant Nutrients:** Classification of essential nutrients, Micronutrients and their functions of (Zn, Fe, Mn, Cu, B, Mo, Cl)	6	**Plant Nutrients:** Classification of essential nutrients,Micronutrients and their functions of (Zn, Fe, Mn, Cu, B, Mo, Cl)	Nil	--
7	Oct. 2019	3 &4	11	6	**Fertilizers and Manures:** Classification & application **Manures:** FYM, **Biofertlizers:**	6	**Fertilizers and Manures:** Classification & application **Manures:** FYM, **Biofertlizers:**	Nil	----
8	Nov.2019	1&2		3	Protection of Plants: Pesticide, Insecticide, Fungicides, Herbicides-	3	Protection of Plants: Pesticide, Insecticide, Fungicides, Herbicides-	Nil	---

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TEACHING AND EVALUATION PLAN

Name of the teacher: Dr. Bhosale R.R	**Year:** 2019-2020	**Semester:** IV
Subject: Dairy Chemistry	**Paper:** I CH-346E Dairy Chemistry	**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.2019	3 & 4	9	6	**Market Milk:** Definition, constituents of milk , Chemical composition, factor affecting composition, physicochemical properties, food and nutritive	6	**Market Milk:** Definition, constituents of milk , Chemical composition, factor affecting composition, physicochemical properties, food and nutritive	Nil	--
2	Dec. 2019	1& 2	12	6	Microbiology of milk, Cream separation- Basic principles, gravity creaming water dilution and centrifugal creaming method,	6	Microbiology of milk, Cream separation- Basic principles, gravity creaming water dilution and centrifugal creaming method,	Nil	---
3	Dec. 2019	3 & 4	11	6	Pasteurization of milk, uses of milk. **Special Milks:** Sterilized milk- Definition	6	Pasteurization of milk, uses of milk. **Special Milks:** Sterilized milk- Definition	Nil	----
4	Jan. 2020	1 &2	11	6	Homogenized milk, Soft curd milk-- Flavored milk, Vitaminised / irradiated milk, Fermented milk, Standardized milk,	6	Homogenized milk, Soft curd milk- Flavored milk, Vitaminised / irradiated milk, Fermented milk, Standardized milk,	Nil	---
5	Jan. 2020	3 & 4	12	6	Milk proteins, Carbohydrates and Vitamins	6	Milk proteins, Carbohydrates and Vitamins	Nil	---

Semester VI

Paper: I CH-346E Dairy Chemistry

Year : 2019-2020

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. 2020	1 & 2	11	6	**Preservatives & Adulterants in Milk** Adulterants Introduction, Modes of Adulteration and their detection.	6	**Preservatives & Adulterants in Milk** Adulterants Introduction, Modes of Adulteration and their detection.	Nil	--
7	Feb. 2020	3 &4	11	6	**Milk Products:** Cream, Butter, Cheese and Ice-Cream.	6	**Milk Products:** Cream, Butter, Cheese and Ice-Cream.	Nil	----

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