Vivekanand College, Kolhapur (Autonomous)

Syllabus Completion Report

Academic Year – 2018-19 Sem-I, Ill, V

Department - Chemistry

Name of the Teacher — Dr. Mrs.S.D.Shirke

Name of the **Class**	**Units** Allotted	**Units Completed**	Remark
B.Sc.I (DÎv-A) + Div.C	1.Stereochemistry of Organic compounds 2. Aromatic Hydrocarbons 3. Alkanes 4. Alkenes	1.Stereochemistry of Organic compounds 2. Aromatic Hydrocarbons3.Alkanes 4. Alkenes	Completed
B.Sc.I (Div- B)	1.Stereochemistry of Organic compounds 2. Aromatic Hydrocarbons3. Alkanes 4. Alkenes	1.Stereochemistry of Organic compounds 2. Aromatic Hydrocarbons3. Alkanes 4. Alkenes	Completed
			Completed
B.Sc.II	1. Amino acids, peptides and proteins	1. . Amino acids, peptides and Proteins	Completed
B.Sc.III	• 1. Natural Products • 2. Pharmaceuticals	• 1. Natural Products • 2. Pharmaceuticals	Completed
M.Sc.I	--------	--------	
M.Sc.II	1. Paper- Advanced Synthetic Methods- Unit- Use of following in Synthesis	• 1. Paper- Advanced Synthetic Methods- Unit- Use of following in Synthesis	Completed

SD 2018

Dr. Mrs. S. D. Shirke

Head

Head
Dept. of Chemistry
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Syllabus
Completion
Report
Academic Year –
2018-19
Sem-II, IV
and VI
Department
- Chemistry

Name of the Teacher — Dr. Mrs.S.D.Shirke

Name of the **Class**	Units Allotted	**Units Completed**	Remark
B.Sc.I (DIV-A)	• Organic chemistry syllabus not included in this semester	• -------	
B.Sc.I (Div- B)	• Organic chemistry syllabus not included in this semester	• -------	
B.Sc.I (Div-C)	• Organic chemistry syllabus not included in this semester	• --------	
B.Sc.II	• Organic chemistry syllabus not included in this semester	• -------	
B.Sc.III	• 1. NMR spectroscopy • 2. Sugar Industry	• 1. NMR spectroscopy • 2. Sugar and Jaggary Manufacturing	Completed
M.Sc.I	• --------	------	------
M.Sc.II	• Agrochemicals	• Agrochemicals	Completed

Dr. Mrs. S. D. Shirke

Head

Head
Dept. of Chemistry
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

SYLLABUS COMPLETION REPORT – DEPARTMENT OF CHEMISTRY

ACADEMIC YEAR 2018-2019

Class	Subject	Total Units	Completed Units	Remaining Units
B.ScIst Year (Sem I)	**Organic Chemistry**	**2**	**Unit I: Fundamentals of Organic Chemistry (09 Lectures)** Physical Effects, Electronic Displacements: Inductive Effect, Electromeric Effect, Resonance and Hyperconjugation. Cleavage of Bonds: Homolysis and Heterolysis. Structure, shape and reactivity of organic molecules: Nucleophiles and electrophiles. Reactive Intermediates: Carbocations, Carbanions and free radicals. Strength of organic acids and bases. **Unit IV: Alkenes** (Upto 5 Carbons) **(07 Lectures)** *Preparation:* Elimination reactions: Dehydration of alkenes and dehydrohalogenation of alkyl halides (Saytzeff's Rule); cis alkenes (Partial catalytic hydrogenation) and trans alkenes (Birch reduction). *Reactions:* cis-addition (alk. KMnO4) and trans-addition (bromine), Addition of HX (Markownikoff's and anti-Markownikoff's addition), Hydration, Ozonolysis, oxymercuration-demercuration, Hydroboration-oxidation.	**NIL**
B.ScIstYear (Sem II)			**Unit II: Halides (12 Lectures)** **Alkyl Halides** (Upto 5 Carbons) Types of Nucleophilic Substitution (SN1, SN2 and SNi) reactions. *Preparation:* from alkenes *and* alcohols. *Reactions:* hydrolysis, nitrite & nitro formation, nitrile & isonitrile formation. Williamson's ether synthesis: Elimination vs substitution. **Aryl Halides** *Preparation:* (Chloro, bromo and iodo-benzene case): from phenol, Sandmeyer & Gattermann reactions. *Reactions (Chlorobenzene):* Aromatic nucleophilic substitution (replacement by –OH group) and effect of nitro substituent. Benzyne Mechanism: KNH2/NH3 (or NaNH2/NH3). Reactivity and Relative strength of C-Halogen bond in alkyl, allyl, benzyl, vinyl and aryl halides. **Unit IV: Ethers (03 Lectures)** *Preparation*, *Reactions of ethers* Cleavage of ethers with HI. 12 **Unit V: Aldehydes and Ketones (06 Lectures)** Formaldehye, acetaldehyde, acetone and benzaldehyde) *Preparation:* from acid chlorides and from nitriles. *Reactions* – Reaction with HCN, ROH, NaHSO3. Iodoform test. Aldol Condensation, Cannizzaro's reaction, Wittig reaction, Benzoin condensation. Clemensen reduction and Wolff Kishner reduction. Meerwein-Pondorff Verley reduction.	**NIL**
B.ScIIrd Year (Sem	Organic Chemistry	**1**	**Unit I: Carboxylic acids and their derivatives** (8) **A] Carboxylic acids (aliphatic and aromatic)**	**NIL**

III)			*Preparation:* Acid and Alkaline hydrolysis of esters. *Reactions:* Hell -Vohlard - Zelinsky Reaction. **B] Carboxylic acid derivatives (aliphatic):** (Upto 5 carbons) *Preparation:* Acid chlorides, Anhydrides, Amides from acids and their interconversion, preparation of Esters with mechanism. *Reactions:* Comparative study of nucleophilicity of acyl derivatives; Reformatsky Reaction, Perkin condensation with mechanism and their applications.	
B.ScIIIrd Year (Sem V)	Organic Chemistry	**3**	**Unit I. Introduction to Spectroscopy [03]** Meaning of spectroscopy, Nature of electromagnetic radiation -wave length, frequency, energy, amplitude, wave number, and their relationship, different units of measurement of wavelength frequency, different regions of electromagnetic radiations Regions of electromagnetic radiation. 12 Interaction of radiation with matter-absorption, emission, florescence and scattering, Types of spectroscopy and advantages of spectroscopic methods. Energy types and energy levels of atoms and molecules. **Unit II. UV Spectroscopy [05]** 1. Introduction, 2. Beer-Lamberts law, absorption of U.V. radiation by organic molecule leading to different excitation. 3. Terms used in U.V. Spectroscopy- Chromophore, Auxochrome, Bathochromic shift, hypsochromic shift, hyperchromic and hypochromic effect. 4. Modes of electromagnetic transitions. 5. Effect of conjugation on position of U.V. band. 6. Calculation of λ-max by Woodward and Fisher rules for dienes and enones systems. 7. Colour and visible spectrum. 8. Applications of U.V. Spectroscopy **Unit III. IR Spectroscopy [06]** 1. Introduction, 2. Principle of I.R. Spectroscopy, 3. IR Instrumentation, schematic diagram-4. Fundamental modes of vibrations types and calculation – (5. Condition for absorption of IR radiations 6. Regions of I.R. Spectrum, fundamental group region, finger print region. 7. Hooks Law for Calculation of vibrational frequency 8. Factors affecting on IR absorption frequency	**NIL**
B.ScIIIrd Year (Sem VI)	Organic Chemistry	**2**	**Unit I. Name reactions. [08]** Statement, General Reaction, Mechanism and Synthetic applications 1. Diels -Alder reaction 2. Oppenauer Oxidation 3. Meerwein –Pondorff-Verley reducti 4. Schmidt rearrangement 5. Hofmann rearrangement 6. Wittig reaction 7. Wagner- Meerwein rearrangement 8. Favorskii rearrangement . 9. Michael reaction 10.Dieckmann's reaction or condensation 11. Problem based on above reactions. **Unit II. Reagents in Organic Synthesis. [06]** Preparation and Applications of following reagents. 1. Lithium aluminium hydride LiAlH4 2. Osmium tetraoxide 3. Dicyclohexyl Carbodiimide (DCC) 4. Raney Nickel 5. 2,3-Dichloro -5,6-dicyano – 1,4-benzoquinone (DDQ) 6. Polyphosphoric acid (PPA) 7. Diazomethane 8. Cerric ammonium nitrate (CAN) 9. N-Bromosuccinamide (NBS) 10.Selenium dioxide (SeO2)	**NIL**

Mr. S.S.Kadam
(Assistant Professor)

Dr. D.B. Patil
(Head of Dept)

Head
Dept. of Chemistry
Vivekanand College Kolhapur

Vivekanand College, Kolhapur (Autonomous)
Syllabus completion Report 2018-19
Department- Chemistry
Name of the Teacher – Dr. A. A. Patravale

Class	Subject	Total Units	Completed Units	Remaining units
B. Sc. I Sem I	Chemistry	1	Annual Practicals	**Nil**
M. Sc. I Sem I	Chemistry	**1**	**UNIT-II** **a) Aromatic Electrophilic Substitutions** Introduction, the arenium ion mechanism, orientation and reactivity in Nitration, Sulphonation, Friedel-Crafts and Halogenation in aromatic systems, energy profile diagrams. The ortho/para ratio, ipso attack, concept of aromaticity, orientation in their ring systems. Diazo-coupling, Vilsmeir Haak reaction, Von Richter rearrangement. Nucleophilic aromatic substitution reactions SN1, SN2. **b)Non benzenoid aromatic Compounds** Aromaticity in Non- benzenoids compounds Annulenes and heteroannulenes, fullerence C60, tropone, tropolone, azulene, fulvene, tropylium salts, ferrocene.	**Nil**
M. Sc. II Sem II	Organic Chemistry	**1**	**a) Atomic absorption Spectroscopy:** Advantages and disadvantages of AAS, Instrumentation, Single and double beam AAS, detection limit and sensitivity, b) **Inductively coupled plasma (ICP) Spectroscopy:** Interferences, applications. Graphite furnace atomic absorption spectroscopy. Introduction, Nebulisation Torch, Plasma, Instrumentation, Interferences, and Applications. Problems: Simple problems based on AAS and ICP	**Nil**
M. Sc. II Sem III	Organic Chemistry	**1**	**a) Drug design** Development of new drugs, procedures followed in drug design, concepts of prodrugs and soft drugs. Theories of drug activity, Quantitative structure activity relationship. Theories of drug activity, Quantitative structure activity relationship. History and development of QSAR. Concepts of drug receptors **b) Study of the Following types of drugs:** a) Antibiotics: Preparation of semi synthetic penicillin, conversion of penicillin into	**Nil**

			cephalosporin, general account of tetracycline & macrocyclic antibiotics(no synthesis) b) Antimalerials: Trimethoprim c) Analgesic & Antipyretics: Paracetamol, Meperidine, methadone, Aminopyrine.	
		1	**Paper XII Drugs and Heterocycles Unit III** **a) Small ring Heterocycles** Three membered and four membered Heterocycles- synthesis and reactions of aziridines, oxiranes, thiranes, azetidines, oxitanes and thietanes. **b) Benzo fused five membered Heterocycles** Synthesis and reactions of benzopyrroles, benzofurans and benzothiophenes.	**Nil**
M. Sc. II Sem IV	Organic Chemistry	1	**Manufacture of following perfume** 2-Phenylethanol, detergents, vanillin and other food flavours, synthetic musk, Acetic acid and butenaldehyde from ethanol butyl acetate.furfural, from bagasse, citric acid from molasses, Application of oro and marker process. Nicotine from tobacco waste and citral from lemon grass, synthetic detergents, glycerol	**Nil**
M. Sc. I Sem I	Organic Chemistry Praticals	10	**Organic Praticals** Lab safty and fire fighting demo Organic Preparation 4 Organic Estimation -4	**Nil**
M. Sc. I Sem II	Organic Chemistry Praticals	10	**Organic Praticals** Binarya Mixture ananlysis compound I to VII organic Estimation	**Nil**

Dr. A.A.Patravale

Dr. D. B. Patil
Head
Dept. of Chemistry
Vivekanand College Kolhapur

VIVEKANAND COLLEGE ESTD JUNE 1964 KOLHAPUR (M.S.)

SYLLABUS COMPLETION REPORT – Department of Chemistry

ACADEMIC YEAR 2018-19

Teacher Name: Dr. Kedar A. Undale				
Class	**Subject**	**Total Units**	**Completed Units**	**Remaining Units**
B.ScIst Year (Sem I)	Chemistry	-		**NIL**
B.ScIstYear (Sem II)	Physical & Analytical Chemistry	**3**	1) Chemical Equilibria 2) Thermodynamics 3) Dairy Chemistry	**NIL**
B.Sc.II, Sem-III	Physical Chemistry	**2**	1) Chemical Kinetics 2) Colligative Properties of Liquids	**NIL**
B.Sc.II, Sem-III & IV	Physical, Organic and Analytical Chermistry	**5**	1) Molecular Spectroscopy 2) Synthetic Reagents 3) Phase Equilibria 4) Solutions 5) Potentiometric Titrations	**NIL**
M. Sc. II Sem III	Organic Chemistry	**1**	1) Pericyclic Reactions	**NIL**
M. Sc. II Sem IV	Organic Chemistry	**1**	1) Newer Methods of Stereoselective Synthesis	**NIL**

Dr. K. A. Undale
(Assistant Professor)

Dr. D. B. Patil
(Head of Department)

Head
Dept. of Chemistry
Vivekanand College Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Syllabus Completion Report

Academic Year - 2018-19

Sem-II, Sem-IV,

Department - Chemistry

Name of the Teacher — Mr. A.T. Mane

Name of the Class	Units Allotted	Units Completed	Remark
M.Sc.I	**Unit II:** a)Organometallic Chemistry of transition elements b) Reaction mechanism of transition metal complexes	**Unit II:** Organometallic Chemistry of transition elements b) Reaction mechanism of transition metal complexes	Completed
M.Sc.I	**Unit IV**: a)Spectroscopic term symbols b) Nuclear and radiochemistry	**Unit IV**: a)Spectroscopic term symbols b) Nuclear and radiochemistry	Completed

Mr. A. T. Mane

Dr.D.B.Patil

Head
Dept. of Chemistry
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Syllabus Completion Report

Academic Year - 2018-19

Sem-I

Department - Chemistry

Name of the Teacher — Mr. A.T. Mane

Name of the Class	Units Allotted	Units Completed	Remark
M.Sc.I	a) Stereochemistry and bonding in main group compounds b) Metal ligand equilibria in solution	a) stereochemistry and bonding in main group compounds b) Metal ligand equilibria in solution	Completed
M.Sc.I	**Unit** Electroanalytical Techniques	**Unit** Electroanalytical Techniques	Completed

Mr. A. T. Mane

Dr.D.B.Patil

Head
Dept. of Chemistry
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)
Syllabus completion Report 2018-19
Department- Chemistry
Name of the Teacher – Dr. D. S. Gaikwad

Class	Subject	Total Units	Completed Units	Remaining units
B. Sc. I Sem I	Chemistry	1	Annual Practicals	**Nil**
M. Sc. I Sem I	Chemistry	**1**	**Paper Organic Chemistry- I Unit IV Stereochemistry:** Introduction of stereochemistry, Symmetry, Chirality, Prochiral relationship, homotopic, enantiotopic and disteriotopic groups and faces. Recemic modifications and their resolution, Geometrical isomerism, R, S and E, Z nomenclature, Threo and Erythro isomers. Allenes and spiranes.	**Nil**
M. Sc. I Sem II	Chemistry	**1**	**Paper Organic Chemistry- II Unit IV** Study of Organometallic compounds Organo-lithium, organo cobalt, Ce, Ti, Use of lithium dialkyl cuprate, their addition to carbonyl and unsaturated carbonyl compounds. Methodologies in organic synthesis: Ideas of synthones and retrones, Functional group transformations and inter conversions of simple functionalities.	**Nil**
M. Sc. II Sem III	Organic Chemistry	**3**	**Paper XI Advanced synthetic methods Unit III** Applications of following metal in organic synthesis: Introduction to organometallic chemistry, applications of metals in organic synthesis such as Pd, Mg, Rh, Tl, Si, use of Cu in Click chemistry.	**Nil**
			Paper XII Drugs and Heterocycles Unit IV a) Six membered Heterocycles with two and more Heteroatoms (8) Synthesis and reactions of diazines & triazines. b) Seven membered Heterocycles (7) Synthesis and reactions of azepines, oxepines & thiepines.	**Nil**
			Paper X Advanced Spectroscopic Techniques Unit IV Carbon-13 NMR Spectroscopy and Combined spectral problems: General introduction to 13C NMR spectroscopy; chemical shift values [aliphatic, olefinic, alkyne, aromatic, heteroaromatic and carbonyl compounds]; proton coupled, proton decoupled 13C NMR spectra, advanced 13C NMR techniques (NOE, DEPT, Off resonance, HETCOR),	**Nil**

			Heteronuclear coupling, problems associated with 13C NMR. Structural problems based on combined spectroscopic techniques (including reaction sequences)	
M. Sc. II Sem IV	Organic Chemistry	**3**	**Paper XV Chemistry of Natural products: Vitamins:** Introduction of Vitamins, Classification and nomenclature of Vitamins, Sources of vitamins and their deficiency, Synthesis, structure. Biological functions of vitamin B1, B2, B5, B6 and Biotin (Vitamin H).	**Nil**
			Alkaloids: Introduction, occurrence, isolation and functions of alkaloids, Structure, stereochemistry and synthesis of the following: Morphine, Reserpine, Atropine and Conin.	**Nil**
			Paper XIV Stereochemistry: Assignment of configuration b) Configuration of diastereomers (Geometrical isomerism) based on physical and chemical methods.	**Nil**

Dr. D. S. Gaikwad

Dr. D. B. Patil
Head
Dept. of Chemistry
Vivekanand College, Kolhapur

VIVEKANAND COLLEGE KOLHAPUR (M.S.) 416003. ESTD. JUNE 1964

SYLLABUS COMPLETION REPORT – Department of Chemistry
ACADEMIC YEAR 2018-19

Teacher Name: Dr. Sanjay S. Ankushrao

Class	Subject	Total Units	Completed Units	Remaining Units
B.Sc Ist Year (Sem I)	Inorganic Chemistry	2	**Unit –III: Ionic Bonding** 3.1 Definition and formation of ionic bond. General characteristics of ionic bonding 3.2 Energetic in Ionic bond formation 3.3 Born-Haber cycle for NaCl and its applications. 3.4 Polarizing power and polarizability. 3.5 Fajan's Rule. 3.6 Ionic character in covalent compounds. 3.7 Bond moment, dipole moment and percentage ionic character. **Unit –IV: Covalent bonding -Valence Bond Theory (VBT)** 4.1 Valence Bond Theory: Introduction, Assumptions, Applications and Limitations. 4.2 Concept of hybridization, different types of hybridization and geometry of molecule. • Linear geometry $BeCl_2$ (sp hybridization) • Planer trigonal geometry BF_3 (sp^2 hybridization) • Tetrahedral geometry $SiCl_4$ (sp^3 hybridization) • Trigonal bipyramidal geometry PCl_5 (sp^3d hybridization) • Octahedral geometry SF_6 (sp^3d^2 hybridization) • Pentagonal bipyramidal geometry(IF_7) (sp^3d^3 hybridization) 4.3 Valence Shell Electron Pair Repulsion (VSEPR) Theory H_2O, ClF_3, ICl_4^-	**NIL**
B.Sc Ist Year (Sem II)	Physical Chemistry	3	**Unit -I: Chemical Energetics** Introduction, Enthalpy of reaction, standard enthalpy changes, various types of enthalpy changes viz, enthalpy of formation, enthalpy of neutralization, enthalpy of ionization, enthalpy of solution (integral and differential enthalpy of solutions), enthalpy of hydration ,enthalpy of phase transitions; Calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data, Variation of enthalpy of reaction with temperature- Kirchoff,s equation. **Unit II: Thermodynamics** Introduction, Spontaneous and nonspontaneous process with examples, Statements of second law of thermodynamics, Carnot's cycle and its efficiency, **Unit III: Entropy and Third law** Concept of entropy, physical significance of entropy, entropy as a state function of V & T, P & T, entropy of mixing of gases, entropy change accompanying phase transition, Third law of	**NIL**

			thermodynamics, calculation of absolute entropies.	
B.Sc. II, Sem-IV	Inorganic Chemistry	**1**	**B] Crystal Field Theory** **(12)** Assumptions of CFT, Crystal field splitting of 'd' orbital in octahedral, tetrahedral and square planar complex, Crystal field stabilization energy (CFSE), Comparison of CFSE for *Oh* and *Td* complexes, Crystal field effects for weak and strong fields ligands, Tetrahedral symmetry, Factors affecting the Magnitude of 10 Dq, Spectrochemical series, Jahn-Teller distortion, Limitations of CFT.	**NIL**
B.Sc IIIrd Year (Sem V)	Analytical Chemistry & Inorganic Chemistry	**3**	**Hard and Soft acids and bases** • Classification of acids and bases as hard and soft. • Theoretical bases of hardness and softness • Pearson's HSAB concept. • Acid-Base strength and hardness and softness. • Application and limitations of HSAB principle. **Corrosion and passivity** • Introduction of corrosion • Electrochemical theory of corrosion • Factors affecting on corrosion, i. Position of metals in the electrochemical series on the basis of standard reduction potential ii. Purity of metal iii. Effect of moisture iv. Effect of oxygen (differential aeration principle) • Hydrogen overvoltage • Methods of protections of metals from corrosion • Passivity i. Definition ii. Types of passivity iii. Oxide film theory and evidences • iv. Applications of passivity **Manufacturing of heavy chemicals** • Introduction • Manufacture of Ammonia (NH3) i. Physico-chemical principles ii. Manufacture by Haber's process • Manufacture of Sulphuric acid (H2SO4) i. Physico-chemical principles ii. Manufacture by Contact process Manufacture of Nitric acid (HNO3) i. Physico-chemical principles ii. Manufacture by Ostwald's (Ammonia oxidation process)	**NIL**
B.Sc IIIrd Year (Sem VI)			**Iron & Steel** Introduction, Occurrence, Extraction of iron by Blast furnace. Steel: Definition and types. Conversion of cast iron into steel by i) Bessemer process. ii) L.D. process, Heat treatment on steel. **Bio-Inorganic Chemistry**	**NIL**

Vivekanand College, Kolhapur (Autonomous)

Syllabus Completion Report

Academic Year – 2018-19

Sem-I, Sem-III, Sem-V

Department- Chemistry

Name of the Teacher – **Dr. S. D. Shinde**

Name of the Class	Units Allotted	Units Completed	Remark
B.Sc.I (Div A + B+C)	▪ Periodicity of Elements ▪ Molecular Orbital Theory [MOT]	▪ Periodicity of Elements ▪ Molecular Orbital Theory [MOT]	Completed
B.Sc.II	▪ Inorganic Semi-Micro Qualitative Analysis	▪ Inorganic Semi-Micro Qualitative Analysis	Completed
B.Sc.III	▪ Metals, Semiconductors and Superconductors. ▪ Inorganic Polymers	▪ Metals, Semiconductors and Superconductors. ▪ Inorganic Polymers	Completed
M.Sc.I	▪ Introduction to Research Methodology and Nano materials	▪ Introduction to Research Methodology and Nano materials	Completed

Dr. Mrs. S. D. Shinde

Dr.D.B.Patil
Head
Dept. of Chemistry
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VIVEKANAND COLLEGE ESTD. JUNE 19** KOLHAPUR / 16003.

Vivekanand College, Kolhapur (Autonomous)

Syllabus Completion Report

Academic Year – 2018-19

Sem-II, Sem-IV, Sem-VI

Department- Chemistry

Name of the Teacher – **Dr. Dr. S. D. Shinde**

Name of the Class	Units Allotted	Units Completed	Remark
B.Sc.I	-	-	-
B.Sc.II	▪ Lanthanoids ▪ Transition Elements (3d series) ▪ Coordination Chemistry: Theories of Metal Complexes A] Valence Bond Theory and B] Crystal Field Theory	▪ Lanthanoids ▪ Transition Elements (3d series) ▪ Coordination Chemistry: Theories of Metal Complexes A] Valence Bond Theory and B] Crystal Field Theory	Completed
B.Sc.III	▪ Inorganic Reaction mechanism ▪ Surface Chemistry	▪ Inorganic Reaction mechanism ▪ Surface Chemistry	Completed
M.Sc.I	▪ Nuclear Magnetic Resonance (NMR) and Mass spectroscopy (MS)	▪ Nuclear Magnetic Resonance (NMR) and Mass spectroscopy (MS)	Completed

Dr. Mrs. S. D. Shinde

Dr.D.B.Patil

Head

Dept. of Chemistry

Vivekanand College, Kolhapur