

Vivekanand College, Kolhapur (Empowered Autonomous)

Teaching Plan : Academic Year – 2018-19.

Subject: Chemistry, Course Title: DSC-1002A : Semester – I

Section -II-Organic Chemistry

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

Month: August			Module/Unit:	Sub-units planned
Lectures	Practicals hr	Total	Induction	<ul style="list-style-type: none"> • General Introduction • Discussion on Course Structure • Discussion on Examination pattern • Discussion on Syllabus
06	-	06		
Month: September			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Stereochemistry of Organic Chemistry	<ul style="list-style-type: none"> • General introduction –Meaning, Definition, Types of stereoisomerism • 1.Optical Isomerism 2. Geometrical Isomerism 3. Conformational Isomerism
12	16	28		
Month: October			Module/Unit:	Sub-units planned
12	16	28	Stereochemistry of Organic Chemistry .	<ul style="list-style-type: none"> • Elements of Symmetry-Ex. of optical isomerism- Lactic acid, Tartaric acid, 2,3-butanoic acid. Geometrical isomerism- Dicarboxylic acids- Maleic and Fumaric acid 3.Conformational Isomerism- Introduction- Ethane and n-Butane
Month: November			Module/Unit:	Sub-units planned
12	16	28	Continued... 2.. Aromatic Hydrocarbons	<ul style="list-style-type: none"> • Cyclohexane – Chair, Boat, Twist boat and Half chair 2. Aromaticity - Definition ,Classification, Structure of Benzene- MOT and VBT, Electrophilic Substitution Reactions- Nitration, Sulphonation , Halogenation and Friedal Craft's Alkylation and Acylation with mechanism.
Month: December			Module/Unit:	Sub-units planned
06	08	14	3. Alkanes 4. Alkenes	Definition, Reactivity,Preparation methods,and characteristic chemical Reactions.-For both Alkanes and Alkenes

Dr. S. D. Shirke



Head of Department

Dept. of Chemistry

Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Empowered Autonomous)

Teaching Plan : Academic Year – 2018-19.

Academic Year: 2018-19 Semesters: B.Sc. II, Sem- III

Department: Chemistry Subject: Chemistry Course Title : DSE-1002 C: Organic chemistry

Month: August			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Amino acids, Peptides and Proteins	<ul style="list-style-type: none"> • Introduction • Definition, Classification and Examples • Electrophoresis, Isoelectric point • Zwitterions-Examples • Peptides- Structure Strecker's synthesis of amino acids. Gabriel phthalimide synthesis
4	-	4		
Month: September			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Proteins.....	<ul style="list-style-type: none"> • Reactions of Amino acids w.r.t. -COOH and -NH₂ group., Protein structures – Primary, Secondary and Tertiary, Edmann Degradation...etc.
4	32	36		
Month: October			Module/Unit:	Sub-units planned
4	32	36	Continued...	Primary, secondary structures of protein Tertiary and Quaternary structures of Proteins. Denaturation of proteins
Month: November			Module/Unit:	Sub-units planned
-	16	16-	-	-----
----	December 32	32	-----	-----

SD Shirke

Dr. S. D. Shirke

Abpahal
Head Of Department

Head
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Vivekanand College, Kolhapur (Empowered Autonomous)

Teaching Plan : Academic Year – 2018-19.

Academic Year: 2018-19 Semesters: B.Sc. III, Sem- V Department: Chemistry

Subject: Chemistry, Course Title: DSC-1002E : Organic chemistry

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

Month: August			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Natural Products- Terpenoids and Alkaloids and	<ul style="list-style-type: none"> • Terpenoids - Definition., structures, • Classification, • Source, Extraction of terpenoids. • General methods to determine the structure of Terpenoids
4	14-	18		
Month: September			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Terpenoids continued.. Alkaloids- ..	<ul style="list-style-type: none"> • - 1. Citral – Structure, Properties • Analytical and synthetic evidence-reaction • • • Introduction, Extraction and Isolation of alkaloids • Classification, Analytical and synthetic evidence of Nicotine
08	28	36		
Month: October			Module/Unit:	Sub-units planned
08	28	36	Pharmaceuticals-	Introduction , Definition, Characteristics of Ideal Drug, Classification- 1. Functional Drugs and 2.chemotherapeutic drugs, Synthesis of selected drugs- Ethophan, Phenobarbitone
Month: November			Module/Unit:	Sub-units planned
	-	08	Pharmaceuticals- Continued	Synthesis of Isoniazid, Benzocaine, Paludrine and.
	December		Continued...	Chloramphenicol, Action of sulpha drug.

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Vivekanand College Kolhapur



Vivekanand College, Kolhapur (Empowered Autonomous)

Teaching Plan : Academic Year – 2018-19.

Subject: Chemistry,

Course Title: DSC-1002A :

B.Sc.-I : Semester – II

Organic Chemistry

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

In this semester 2018-19 : Organic Chemistry syllabus is not involved.

Vivekanand College, Kolhapur (Empowered Autonomous)

Teaching Plan : Academic Year – 2018-19.

Subject: Chemistry, Course Title: DSC-1002D:

B.Sc.-II : Semester – IV

Organic Chemistry

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

In this semester 2018-19 : Organic Chemistry syllabus is not involved.

Vivekanand College, Kolhapur (Empowered Autonomous)

Teaching Plan : Academic Year – 2018-19.

Academic Year: 2018-19 Semesters: B.Sc. III, Sem- V Department: Chemistry

Subject: Chemistry, Course Title: DSC-1002F2 : Organic chemistry

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

Month: January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	NMR Spectroscopy	<ul style="list-style-type: none"> Principle, Terms involved – Spining nuclei, magnetic moment, Precessional frequency, nuclear resonance Chemical shift and factors affecting to chemical shift
8	28-	36		
Month: February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	NMR-continued...	<ul style="list-style-type: none"> Spin – spin coupling-Splitting-Types Peak area Coupling Constant- Types Problems....
08	28	36		
Month: March			Module/Unit:	Sub-units planned
08	28	36	Sugar Industry	<ul style="list-style-type: none"> Introduction, Extraction of Juice Clarification of Juice Concentration of juice Centrifugation of juice
Month: April			Module/Unit:	Sub-units planned
08	-	08	Sugar Industry-continued ...	<ul style="list-style-type: none"> Crystallization of sugar, Refining of sugar Byproducts of sugar industry

S.D. Shirke

Dr. S. D. Shirke

S. D. Shirke

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Head

Dept. of Chemistry

Vivekanand College, Kolhapur



Vivekanand College, Kolhapur (Autonomous)

Annual Teaching Plan

Academic Year:2018-19

Semesters: B.Sc. I (A+B+C), Sem-I

Department: Chemistry

Subject: Chemistry

Course Title:DSC-1002A: Inorganic & Organic Chemistry

Name of the Teacher: Mr. Satish Suresh Kadam

Month: November			Module/Unit:	Sub-units planned
Lectures	Practical hr	Total	Induction	<ul style="list-style-type: none"> • General Introduction • Discussion on Course Structure • Discussion on Syllabus
06	-	06		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Fundamentals of Organic Chemistry	<ul style="list-style-type: none"> • General introduction • Reactive intermediates • Nucleophiles and electrophiles. • Electronic Displacements
12	16	28		
Month: January			Module/Unit:	Sub-units planned
12	16	28	Fundamentals of Organic Chemistry	<ul style="list-style-type: none"> • Cleavage of Bonds • Physical Effects • Strength of organic acids and bases.
Month: February			Module/Unit:	Sub-units planned
12	16	28	Alkenes	<ul style="list-style-type: none"> • Elimination reactions: Introduction • Saytzeff's Rule • Birch reduction). • Partial catalytic hydrogenation) • cis-addition (alk. KMnO₄) and trans-addition
12	16	28		
Month: March			Module/Unit:	Sub-units planned
06	08	14	Alkenes	<ul style="list-style-type: none"> • Addition of HX • Hydration • Ozonolysis • oxymercuration-demercuration • Hydroboration-oxidation

Satish Suresh Kadam

Mr. S.S.Kadam

(Assistant Professor)

D.B. Patil

Dr. D.B. Patil

(Head of Dept)

Head

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Vivekanand College, Kolhapur



Vivekanand College, Kolhapur (Autonomous)

Annual Teaching Plan

Academic Year: 2018-19 Semesters: B.Sc. I (A+B+C), Sem-II Department: Chemistry

Subject: Chemistry Course Title: DSC-1002B: Physical & Organic Chemistry

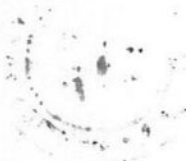
Name of the Teacher: Mr. Satish Suresh Kadam

Month: April			Module/Unit:	Sub-units planned
Lectures	Practicals hr	Total	Halides	<ul style="list-style-type: none"> Alkyl Halides :Introduction, Types of Nucleophilic Substitution Preparation of Alkyl Halides Williamson's ether synthesis Reactions: hydrolysis, nitrite & nitro formation, nitrile & isonitrile formation
06	-	06		
Month: May			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Halides	<ul style="list-style-type: none"> Aryl Halides :Preparation Sandmeyer & Gattermann reactions Aromatic nucleophilic substitution Reactivity and Relative strength of C-Halogen bond in alkyl, allyl, benzyl, vinyl and aryl halides.
12	16	28		
Month: June			Module/Unit:	Sub-units planned
12	16	28	Ethers	<ul style="list-style-type: none"> Preparation Reactions of ethers Cleavage of ethers with HI. Introduction
Month: July			Module/Unit:	Sub-units planned
12	16	28	Aldehydes and Ketones	<ul style="list-style-type: none"> Preparation Reaction with HCNs Iodoform test. Aldol Condensation, Clemensen reduction and Wolff Kishner reduction
Month: August			Module/Unit:	Sub-units planned
06	08	14	Aldehydes and Ketones	<ul style="list-style-type: none"> Cannizzaro's reaction Wittig reaction Meerwein-Ponndorf Verley reduction Benzoin condensation

Satish

Mr. S.S.Kadam

(Assistant Professor)



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Dr. D.B. Patil

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Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Annual Teaching Plan

Academic Year: 2018-19

Semesters: B.Sc. II, Sem-III

Department: Chemistry

Subject: Chemistry

Course Title: DSC-1002C Physical & Organic Chemistry

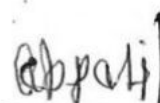
Name of the Teacher: Mr. Satish Suresh Kadam

Month: May			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Carboxylic acids and their derivatives	<ul style="list-style-type: none"> • Introduction • Carboxylic acids (aliphatic and aromatic) • <i>Preparation</i>: Acidic and Alkaline hydrolysis of esters.
4	-	4		
Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Carboxylic acids and their derivatives	<ul style="list-style-type: none"> • <i>Reactions</i>: Hell -Vohlard - Zelinsky Reaction. • Carboxylic acid derivatives (aliphatic) :<i>Preparation</i> • preparation of Esters with mechanism • Comparative study of nucleophilicity of acyl derivatives
4	-	04		
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Carboxylic acids and their derivatives	<ul style="list-style-type: none"> • Reformatsky Reaction • Perkin condensation with mechanism and their applications.
4	-	04		
Month: February			Module/Unit:	Sub-units planned
-	-	-	-	-



Mr. S.S.Kadam

(Assistant Professor)



Dr. D.B. Patil

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Vivekanand College, Kolhapur



Vivekanand College, Kolhapur (Autonomous)

Annual Teaching Plan

Academic Year: 2018-19

Semesters: B.Sc. III, Sem-VI

Department: Chemistry

Subject: Chemistry

Course Title: DSE-1002E: Inorganic & Physical Chemistry
DSE-1002F: Organic & Analytical Chemistry

Name of the Teacher: Mr. Satish Suresh Kadam

Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Name Reactions	<ul style="list-style-type: none"> • Introduction. • Beckmann, Benzilic acid, Baeyer Villiger, Diels - Alder reaction,.
06	-	06		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Name Reactions	<ul style="list-style-type: none"> • Mannich Reaction, Michael Reaction, Fries, Dienone-Phenol rearrangement, Problems based on reactions
12	52	64		
Month: January			Module/Unit:	Sub-units planned
12	52	64	Synthetic Reagents	<ul style="list-style-type: none"> • DDQ, OsO₄, N-bromosuccinamide, Zn-Hg, DCC,
Month: February			Module/Unit:	Sub-units planned
12	52	64		<ul style="list-style-type: none"> • LiAlH₄, CAN, Raney Ni, Diazomethane
Month: March			Module/Unit:	Sub-units planned
06	13	19	Combined problems	<ul style="list-style-type: none"> • Problems based on reaction

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Annual Teaching Plan

Academic Year: 2018-19

Semesters: B.Sc. III, Sem-V

Department: Chemistry

Subject: Chemistry

Course Title: DSE-1002G: Inorganic & Physical Chemistry
DSE-1002H: Organic & Industrial Chemistry

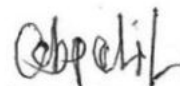
Name of the Teacher: Mr. Satish Suresh Kadam

Month: May			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Introduction to Spectroscopy	<ul style="list-style-type: none"> • Meaning of spectroscopy, • Nature of electromagnetic radiation • different units of measurement of wavelength frequency, different regions of electromagnetic radiations,
09	-	09		
Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Introduction to Spectroscopy	<ul style="list-style-type: none"> • Interaction of radiation with matter-absorption, emission, fluorescence and scattering, • Types of spectroscopy and advantages of spectroscopic methods. • Energy types and energy levels of atoms and molecules
12	52	64		
Month: July			Module/Unit:	Sub-units planned
12	52	64	Ultra-Violet (UV) Spectroscopy	<ul style="list-style-type: none"> • ; Introduction, Beer-Lamberts law, • Terms used in U.V. Spectroscopy- • Modes of electromagnetic transitions. Effect of conjugation on position of U.V. band, • Calculation of λ-max by Woodward and Fisher rules for dienes systems, Colour and visible spectrum,
Month: August			Module/Unit:	Sub-units planned
6	-	06	Ultra-Violet (UV) Spectroscopy	<ul style="list-style-type: none"> • Effect of conjugation on position of U.V. band, Calculation of λ-max by Woodward and Fisher rules enones systems, • Colour and visible spectrum, Applications of U.V. Spectroscopy



Mr. S.S.Kadam

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Dr. D.B. Patil

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Vivekanand College, Kolhapur



Vivekanand College, Kolhapur (Autonomous)

Annual Teaching Plan 2018-19

B. Sc. Sem. I; M.Sc. I Sem I; M.Sc. II Sem. III

Department- Chemistry

Name of the Teacher – Dr. A. A. Patravale

Month – June					
B.Sc.I Sem I:- Course Title:- Chemistry					
Lectures	Practicals	Total	Module Unit	Sub-Units Planned	
00	01	04	Academic practical	Introduction of Glasswares	
M. Sc. I Sem I:- Course Title:- Chemistry					
02	00	02	Aromatic Electrophilic Substitutions	Introduction, the arenium ion mechanism, orientation and reactivity in Nitration, Sulphonation, Friedel-Crafts and Halogenation in aromatic systems, energy profile diagrams.	
M. Sc. II Sem III :- Course Title:- Organic Chemistry					
Lectures	Practicals	Total	Module Unit	Sub-Units Planned	
02	00	10	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.	
M. Sc. II Sem I :- Course Title:- Organic Chemistry					
--	02	--	Organic practical	1] Introduction and lab safety concept 2] Fire fighting technique	

Month – July					
B.Sc.I Sem I:- Course Title:- Chemistry					
Lectures	Practicals	Total	Module Unit	Sub-Units Planned	
00	04	16	Academic Practical	1. Organic spotting 2. Eudiometer	
M.Sc.I Sem I:- Course Title:- Chemistry					
03	--	03	Aromatic Electrophilic Substitutions	The ortho/para ratio, ipso attack, concept of aromaticity, orientation in their ring systems. Diazo-coupling, Vilsmeier Haack reaction, Von Richter rearrangement. Nucleophilic aromatic substitution reactions SN1, SN2.	
M.Sc.II Sem III :- Course Title:- Organic Chemistry					
Lectures	Practicals	Total	Module Unit	Sub-Units Planned	

06	--	30	Drug design	Theories of drug activity, Quantitative structure activity relationship. History and development of QSAR. Concepts of drug receptors
--	24	--	Organic Preparation	1] Preparation of Benzene azo beta naphthol 2] Preparation of para nitroso N,N dimethyle aniline

Month – August

B.Sc.I Sem I:- Course Title:- Chemistry				
Lectures	Practicals	Total	Module Unit	Sub-Units Planned
00	04	16	Academic Practicals	1. Organic spotting 2. Standardization of HCl 3. Chemical Kinetics
M.Sc.I Sem I:- Course Title:- Chemistry				
04	--	04	Non benzenoid aromatic Compounds	Aromaticity in Non- benzenoids compounds Annulenes and heteroannulenes, fullerece C60,tropone, tropolone, azulene, fulvene, tropylium salts, ferrocene.
M.Sc.II Sem III :- Course Title:- Organic Chemistry				
Lectures	Practicals	Total	Module Unit	Sub-Units Planned
16		48	Study of the Following types of drugs	a) Antibiotics: Preparation of semi synthetic penicillin, conversion of penicillin into cephalosporin, general account of tetracycline & macrocyclic antibiotics(no synthesis) b) Antimalerials: Trimethoprim c) Analgesic & Antipyretics: Paracetamol, Meperidine, methadone, Aminopyrine.
M.Sc.II Sem I :- Course Title:- Organic Chemistry				
--	32	--	Organic Preparation	1] Dye preparation -2 P-nitro actanilide

Month – September

B.Sc.I Sem I:- Course Title:- Chemistry				
Lectures	Practicals	Total	Module Unit	Sub-Units Planned
00	04	16	Academic Practicals	1. Organic spotting 2. Standardization of K2Cr2O7 3. Viscosity
M.Sc.I Sem I:- Course Title:- Chemistry				

Lectures	Practicals	Total	Module Unit	Sub-Units Planned
03	--	03	Non benzenoid aromatic Compounds	Annulenes and heteroannulenes, fullerene C ₆₀ , tropone, tropolone, azulene, fulvene, tropylium salts, ferrocene.

M.Sc.II Sem III :- Course Title:- Organic Chemistry

Lectures	Practicals	Total	Module Unit	Sub-Units Planned
12	--	36	Small ring Heterocycles Benzo fused five membered Heterocycles	Three membered and four membered Heterocycles- synthesis and reactions of aziridines, oxiranes, thiranes, azetidines, oxitanes and thietanes. Synthesis and reactions of benzopyrroles, benzofurans and benzothiophenes

M.Sc.II Sem I :- Course Title:- Organic Chemistry

--	24	--	Organic Estimation	1] Estimation of Aspirin 2] Colorometric analysis
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Month-October

M.Sc.II Sem III :- Course Title:- Organic Chemistry

Lectures	Practicals	Total	Module Unit	Sub-Units Planned
08	16	24	Six and seven membered with two and more heteroatoms	Synthesis, chemical reactions of pyridazine, pyrimidine and pyrazine. 1,2,3-triazole, 1,2,4-triazole and 1,3,5-triazole.
			Organic Estimation	1] Estimation of ibuprofen

Dr. A. A. Patravale
Dr. A. A. Patravale

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



Vivekanand College, Kolhapur (Autonomous)

Annual Teaching Plan

Academic Year - 2018-19

B. Sc. Sem. II; M.Sc. I Sem II; M.Sc. II Sem. IV

Department- Chemistry

Name of the Teacher – **Dr.A. A. Patravale**

Month – January				
M.Sc.I Sem. II:- Course Title:- Organic Chemistry-II				
Lectures	Practicals	Total	Module Unit	Sub-Units Planned
06	--	06	Atomic absorption and Inductively coupled plasma (ICP) Spectroscopy	Atomic Absorption Spectroscopy (AAS) Introduction, Principal, difference between AAS and FES, Advantages of AAS over FES.
M.Sc.II Sem IV :- Course Title:- Organic Chemistry				
Lectures	Practicals	Total	Module Unit	Sub-Units Planned
12	00	44	Manufacture of following perfume	Introduction, significance of perfume .2-Phenylethanol, detergents.
M.Sc.II Sem II :- Course Title:- Organic Chemistry				
--	32	--	Binary Mixture	Demo of Speration of binary compound Binary mixture -I and II
B.Sc.I Sem I:- Course Title:- Chemistry				
Lectures	Practicals	Total	Module Unit	Sub-Units Planned
00	04	16	Academic Practicals	1. Organic spotting 2. Chromatography-I 3. Spot test

Month – February				
M.Sc.I Sem. II:- Course Title:- Organic Chemistry-II				
Lectures	Practicals	Total	Module Unit	Sub-Units Planned
08	--	08	Atomic absorption and Inductively coupled plasma (ICP) Spectroscopy	Advantages and disadvantages of AAS, Instrumentation, Single and double beam AAS, detection limit and sensitivity, Interferences, applications. Graphite furnace atomic absorption spectroscopy.
M.Sc.II Sem IV :- Course Title:- Organic Chemistry				
Lectures	Practicals	Total	Module Unit	Sub-Units Planned
12	--	60	Manufacture of following perfume	2-Phenylethanol, detergents, vanillin and other food flavours, synthetic

					musk, Acetic acid and butenaldehyde from ethanol butyl acetate.
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M.Sc.II Sem II :- Course Title:- Organic Chemistry

--	48	--		Binary Mixture	Demo of Separation of binary compound Binary mixture -II and III
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B.Sc.I Sem I:- Course Title:- Chemistry

Lectures	Practicals	Total		Module Unit	Sub-Units Planned
00	04	16		Academic Practicals	1. Chemical Kinetics-II 2. Chromatography-II 3. Spot test-4,5,6 4. Estimation of Vinegar

Month – March

M.Sc.I Sem. II:- Course Title:- Organic Chemistry-II

: Lectures	Practicals	Total		Module Unit	Sub-Units Planned
08	--	48		Atomic absorption and Inductively coupled plasma (ICP) Spectroscopy	Introduction, Nebulisation Torch, Plasma, Instrumentation, Interferences, and Applications.
--	32	--		Binary Mixture	Binary mixture -IV and V

M.Sc.II Sem IV :- Course Title:- Organic Chemistry

Lectures	Practicals	Total		Module Unit	Sub-Units Planned
16	00	16		Manufacture of following perfume	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

B.Sc.I Sem I:- Course Title:- Chemistry

Lectures	Practicals	Total		Module Unit	Sub-Units Planned
01	00	00		Overall Practical discussion	All practicals discussed.

Month – April

M.Sc.I Sem. II:- Course Title:- Organic Chemistry-II

: Lectures	Practicals	Total		Module Unit	Sub-Units Planned
08	--	08		Atomic absorption and Inductively coupled plasma (ICP) Spectroscopy	Problems: Simple problems based on AAS and ICP

M.Sc.II Sem IV :- Course Title:- Organic Chemistry

Lectures	Practicals	Total		Module Unit	Sub-Units Planned
12	--	36		Manufacture of following perfume	Nicotine from tobacco waste and citral from lemon grass, synthetic

				detergents, glycerol
M.Sc.II Sem II :- Course Title:- Organic Chemistry				
	24		Binary Mixture	Binary mixture -V and VI Revision

Dr. A. A. Patravale
Dr. A. A. Patravale



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Vivekanand College, Kolhapur (Autonomous)

Annual Teaching Plan

Academic Year - 2018-19

Sem. I, III, V

Department- Chemistry

Name of the Teacher – **Dr. Undale K. A.**

Month – July

B.Sc.I Sem I				
: Lectures	Practicals	Total	Module Unit	Sub-Units Planned
--	16	16		
B.Sc.II Sem III :- Course Title:- Physical and Analytical Chemistry				
Lectures	Practicals	Total		
04	32	36	Phase Equilibria	Introduction, Phase, components and degrees of freedom of a system, criteria of phase equilibrium, Gibbs Phase Rule, Clausius-Clapeyron equation and its importance,
B.Sc.III.Sem V:- Course Title:- Physical and Analytical Chemistry				
Lectures	Practicals	Total		
08	28	36	Molecular Spectroscopy	Introduction, Electromagnetic radiations, Electromagnetic spectrum, Energy level diagram. Rotational spectra of diatomic molecules: Rigid rotor model, Moment of inertia (derivation expected), Energy levels of rigid rotor, selection rules, spectral intensity, Maxwell-Boltzmann population distribution, Determination of bond length, isotopic effect, interaction of radiation with rotating molecules.
M. Sc. II Sem III :- Course Title:- Organic Reaction Mechanism				
Lectures	Practicals	Total		
04	--	04	Pericyclic Reactions	Molecular orbital symmetry, Frontier orbital of ethylene, 1,3-butadiene, 1,3,5-hexatriene and allyl system,

Month – August

B.Sc.I Sem I

: Lectures	Practicals	Total	Module Unit	Sub-Units Planned
--	16	16		

B.Sc.II Sem III :- Course Title:- Physical and Analytical Chemistry

Lectures	Practicals	Total	Module Unit	Sub-Units Planned
04	32	36	Phase Equilibria	Phase diagrams of onecomponent systems (water and sulphur) and two component systems involving eutectics, congruent and incongruent melting points (lead-silver, FeCl ₃ -H ₂ O and KI-Water only).

B.Sc.III.Sem V:- Course Title:- Physical and Analytical Chemistry

Lectures	Practicals	Total	Module Unit	Sub-Units Planned
08	28	36	Molecular Spectroscopy Chromatography	Vibrational spectra of diatomic molecules: Simple Harmonic oscillator model, vibrational energies of diatomic molecules, determination of force constant, overtones. Interaction of radiation with vibrating molecules. Raman Spectra: concept of polarizability, pure rotational and pure vibrational Raman spectra of diatomic molecules, selection rules. Numerical problems Introduction, General Introduction, Basic principle of chromatography, Classification of Chromatography..

M. Sc. II Sem III :- Course Title:- Organic Reaction Mechanism

Lectures	Practicals	Total	Module Unit	Sub-Units Planned
04	--	04	Pericyclic Reactions	classification of pericyclic reaction, Wood-ward Hoffman correlation diagrams, FMO and PMO approach, electrocyclic reactions, conrotatory and disrotatory motions, 4n, 4n+2 and allyl systems, cycloaddition, and supra and antara facial additions, 4n and 4n+2 systems, 2+2 additions of ketenes,

Month – September

B.Sc.ISem I

: Lectures	Practicals	Total	Module Unit	Sub-Units Planned
--	16	16		

B.Sc.IISem III :- Course Title:- Physical and Analytical Chemistry

Lectures	Practicals	Total	Module Unit	Sub-Units Planned
04	32	36	Solutions	Thermodynamics of ideal solutions: Ideal solutions and Raoult's law, deviations from Raoult's law, non-ideal solutions, Vapour pressure-composition and temperature composition curves of ideal and non-ideal solutions, Distillation of solutions, Azeotropes,

B.Sc.III.Sem V:- Course Title:- Physical and Analytical Chemistry

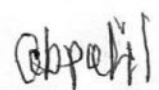
Lectures	Practicals	Total	Module Unit	Sub-Units Planned
08	28	36	Chromatography	Paper Chromatography: Principle, methodology, types of Papers and treatment, sample loading, choice of solvent, development: ascending, descending, circular; location of spot, determination of R_f value, applications and Advantages and Disadvantages. Thin layer chromatography: principle, solvent system, stationary phases, preparation of TLC plates, detecting reagents, methodology-sample loading, development, detection of spot, determination of R_f value, preparative TLC, applications and Advantages and Disadvantages. Comparison of TLC and paper chromatography.

M. Sc. II Sem III :- Course Title:- Organic Reaction Mechanism

Lectures	Practicals	Total	Module Unit	Sub-Units Planned
04	--	04	Pericyclic Reactions	1,3-dipolar cycloaddition and chelotropic reactions, sigmatropic rearrangement, supra and antarafacial shifts of H,

Month – October					
B.Sc.ISem I					
: Lectures	Practicals	Total		Module Unit	Sub-Units Planned
--	16	16			
B.Sc.IISem III :- Course Title:- Physical and Analytical Chemistry					
Lectures	Practicals	Total			
04	32	36		Phase Equilibria Solutions	Numericals Unit Test
B.Sc.III.Sem V:- Course Title:- Organic and Inorganic Chemistry					
Lectures	Practicals	Total			
08	28	36		Synthetic Reagents	DDQ, OsO ₄ , N-bromosuccinamide, Zn-Hg, DCC, LiAlH ₄ , CAN, Raney Ni, Diazomethane Unit Test
M. Sc. II Sem III :- Course Title:- Organic Reaction Mechanism					
Lectures	Practicals	Total			
04	--	04		Pericyclic Reactions	Sigmatropic shifts involving carbon moieties, (3,3) and (5,5) sigmatropic rearrangement and Claisen and Cope and Aza Cope rearrangement, Ene reaction. Unit Test


Dr. Undale K. A.


Dr. D. B. Patil

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Vivekanand College, Kolhapur (Autonomous)

Annual Teaching Plan

Academic Year - 2018-19

Sem. II, IV, VI

Department- Chemistry

Name of the Teacher – **Dr. Undale K. A.**

Month – December

B.Sc.I Sem I Physical Chemistry

Lectures	Practicals	Total	Module Unit	Sub-Units Planned
08	16	24	Chemical Equilibria	Introduction, Concept of free energy, Free energy change in chemical reaction, law of chemical equilibrium, Distinction between Gibbs free energy and standard Gibbs free energy, LeChatelier's Principle

B.Sc.II Sem III :-

Lectures	Practicals	Total		
--	32	32		

B.Sc.III.Sem V:- Course Title:- Physical and Analytical Chemistry

Lectures	Practicals	Total		
04	28	32	Renewable Energy Sources	Introduction, Batteries -Primary, Secondary cells, Lithium Ion Cell Fuel Cells- Types of fuel cells, Hydrogen- Oxygen fuel cell, Hydrocarbon – Oxygen fuel cell, Coal fired fuel cell.

M. Sc. II Sem III :- Course Title:- Organic Reaction Mechanism

Lectures	Practicals	Total		
04	--	04	Newer methods of stereoselective synthesis	Introduction, Stereoselective, Stereospecific Reactions

Month – January


B.Sc.I Sem I Physical Chemistry

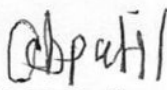
Lectures	Practicals	Total	Module Unit	Sub-Units Planned
08	16	24	Chemical Equilibria	Conditions for maximum yield industrial processes like manufacture ammonia and sulphuric acid. Relationship between K_p , K_c and K_x for reactions involving ideal gases.

B.Sc.IISem III				
Lectures	Practicals	Total		
	32	32		
B.Sc.III.Sem V:- Course Title:- Physical and Analytical Chemistry				
Lectures	Practicals	Total		
04	28	32	Renewable Energy	Biomass Energy – Introduction, Origin of biomass, conversion of biomass into energy by alcohol fermentation and anaerobic digestion method.
M. Sc. II Sem III :- Course Title:- Organic Reaction Mechanism				
Lectures	Practicals	Total		
04	--	04	Newer methods of stereoselective synthesis	Enantioselective synthesis (chiral approach) reactions with hydride donors, hydroboration, catalytic hydrogenation

Month – February				
B.Sc.ISem I:- Course Title:- Analytical And Industrial Chemistry				
: Lectures	Practicals	Total	Module Unit	Sub-Units Planned
08	16	24	Dairy Chemistry	Introduction, Constituents of Milk and their Physicochemical Properties, Milk Processing
B.Sc.IISem III				
Lectures	Practicals	Total		
	32	32		
B.Sc. III Sem V:- Course Title:- Physical and Analytical Chemistry				
Lectures	Practicals	Total		
04	28	32	Fermentation Industry	Introduction, importance, Basic requirement of fermentation process, Factors favoring fermentation, fermentation operations. Manufacture of Industrial alcohol (Ethyl alcohol) from a) Molasses b) Food grains, c) manufacture of alcohol from fruits (wine).
M. Sc. II Sem III :- Course Title:- Organic Reaction Mechanism				
Lectures	Practicals	Total		
04	--	04	Newer methods of stereoselective synthesis	Catalytic hydrogenation via chiral hydrazones and oxazolines

Month – March				
B.Sc.ISem I				
: Lectures	Practicals	Total	Module Unit	Sub-Units Planned
08	16	24	Dairy Chemistry	Milk Processing, Definition & Composition of Dairy Products: Cream, Butter, Ghee, Icecream, Milk Powder
B.Sc.IISem III				
Lectures	Practicals	Total		
	32	32		
B.Sc.III.Sem V:- Course Title:- Physical and Analytical Chemistry				
Lectures	Practicals	Total		
04	28	32	Fermentation Industry	Grades of alcohols: Silence spirit, rectified spirit, absolute alcohol, proof spirit, denatured spirit, duty and duty free alcohol. Importance of power alcohol as fuel
M. Sc. II Sem III :- Course Title:- Organic Reaction Mechanism				
Lectures	Practicals	Total		
04	--	04	Newer methods of stereoselective synthesis	Sharpless epoxidation, Diels Alder selective synthesis.


 Dr. Undale K. A.


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Vivekanand College, Kolhapur (Autonomous)

Department of Chemistry

Academic Year: 2018-19

Annual Teaching Plan

Name of the teacher: Mr. A. T. Mane

Programme : M.Sc. I Semester I

Subject: Chemistry Course Title: Inorganic Chemistry

Month August			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	a) Stereochemistry and Bonding in main group compounds	VSEPR theory and drawbacks, bond length, bond angles, bond energies and resonance, $P\pi-P\pi$ and $P\pi-d\pi$ bonds, Bent rule, Walsh diagram Back bonding, some simple reactions of covalently bonded molecules
8	12	20		
Month September			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Metal ligand equilibria in solution	Definition of stability constant, step wise and overall formation constant and their interaction, trends in stepwise constants, factors affecting the stability of metal Polarography:
7+5	12	24	Electroanalytical Techniques	
Month Oct./ Nov.			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Electroanalytical Techniques	Amperometry: Voltametry:
10	10	20		

Programme : M.Sc. I Semester II

Subject: Chemistry Course Title: Inorganic Chemistry

Month January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Organometallic Chemistry of transition elements	Ligand hapticity, electron count for different types of organometallic compounds, 18 and 16 electron rule exceptions, synthesis, structure and bonding, organometallic reagents in organic synthesis and in homogeneous catalytic reactions,
8	12	20		
Month February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Reaction mechanism of transition metal complexes	Classification of inorganic reactions, ligand substitution reaction and their mechanisms of octahedral complexes, Acid hydrolysis, factors affecting the acid hydrolysis, Base hydrolysis, square planar complexes, trans effect
7	12	19		
Month March			Module/Unit:	
Lectures	Practicals	Total	Spectroscopic term symbols	Terms, Inter-electronic repulsion, spin orbit coupling, ground terms, determination of term symbol of d1 to d5 Configuration / complexes, Energy ordering of terms, microstates, Weak and stronger field approach, Orgel diagram
8	12	20		
Month April			Module/Unit:	
Lectures	Practicals	Total	Nuclear and radiochemistry	Nuclear stability and nuclear binding energy, radioactivity and radioactive decay, radioactive equilibrium, classification of nuclear reactions, Q value
7	12	19		

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Mr. A. T. Mane



D.B. Patil

Dr. D.B. Patil.

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Dept. of Chemistry
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Vivekanand College, Kolhapur (Autonomous)

Annual Teaching Plan 2018-19

B. Sc. Sem. I; M.Sc. I Sem I; M.Sc. II Sem. III

Department- Chemistry

Name of the Teacher – Dr. D. S. Gaikwad

Month – June

B.Sc.I Sem I:- Course Title:- Chemistry					
: Lectures	Practicals	Total	Module Unit	Sub-Units Planned	
00	01	04	Academic practical	Introduction of Glasswares	
M. Sc. I Sem I:- Course Title:- Chemistry					
02	00	02	Stereochemistry	Introduction of stereochemistry, Symmetry, Chirality, Prochiral relationship, homotopic, enantiotopic and distereiotopic groups and faces.	
M. Sc. II Sem III :- Course Title:- Organic Chemistry					
Lectures	Practicals	Total	Module Unit	Sub-Units Planned	
02	02	10	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.	

Month – July

B.Sc.I Sem I:- Course Title:- Chemistry					
: Lectures	Practicals	Total	Module Unit	Sub-Units Planned	
00	04	16	Academic Practical	1. Organic spotting 2. Eudiometer	
M.Sc.I Sem I:- Course Title:- Chemistry					
03	--	03	Stereochemistry	Recemic modifications and their resolution, Geometrical isomerism, R, S and E, Z nomenclature, Threo and Erythro isomers. Allenes and spiranes,	
M.Sc.II Sem III :- Course Title:- Organic Chemistry					
Lectures	Practicals	Total	Module Unit	Sub-Units Planned	
06	24	30	Drugs and Heterocycles	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 & thiepinines.	

Month – August

B.Sc.I Sem I:- Course Title:- Chemistry					
Lectures	Practicals	Total		Module Unit	Sub-Units Planned
00	04	16		Academic Practicals	1. Organic spotting 2. Standardization of HCl 3. Chemical Kinetics
M.Sc.I Sem I:- Course Title:- Chemistry					
04	--	04		Stereochemistry	Stereochemistry of the compounds containing Nitrogen, Sulphur and phosphorous. Conformational analysis: Cyclohexane derivatives, stability and reactivity, Conformational analysis of Mono and disubstituted cyclohexanes.
M.Sc.II Sem III :- Course Title:- Organic Chemistry					
Lectures	Practicals	Total			
16	32	48		Aplications of following metals in organic synthesis	Pd, Rh, Tl, Si metals in organic synthesis.
				Combined spectral problems	Structural problems based on combined spectroscopic techniques (including reaction sequences)

Month – September

B.Sc.I Sem I:- Course Title:- Chemistry					
Lectures	Practicals	Total		Module Unit	Sub-Units Planned
00	04	16		Academic Practicals	1. Organic spotting 2. Standardization of K ₂ Cr ₂ O ₇ 3. Viscosity
M.Sc.I Sem I:- Course Title:- Chemistry					
Lectures	Practicals	Total		Module Unit	Sub-Units Planned
03	--	03		Stereochemistry	Conformational analysis of Mono and disubstituted cyclohexanes. Previous year Question paper discussion.
M.Sc.II Sem III :- Course Title:- Organic Chemistry					
Lectures	Practicals	Total			
12	24	36		Carbon-13 NMR Spectroscopy	General introduction to ¹³ C NMR spectroscopy; chemical shift values [aliphatic, olefinic, alkyne, aromatic, heteroaromatic and carbonyl compounds]; proton coupled, proton decoupled ¹³ C NMR spectra, advanced ¹³ C NMR techniques (NOE, DEPT, Off resonance, HETCOR), Heteronuclear coupling,

				problems associated with ¹³ C NMR.
			Combined spectral problems	Structural problems based on combined spectroscopic techniques (including reaction sequences)
Month-October				
M.Sc.II Sem III :- Course Title:- Organic Chemistry				
Lectures	Practicals	Total		
08	16	24	Six and seven membered with two and more heteroatoms	Synthesis, chemical reactions of pyridazine, pyrimidine and pyrazine. 1,2,3-triazole, 1,2,4-triazole and 1,3,5-triazole.
			Combined spectral problems	Structural problems based on combined spectroscopic techniques (including reaction sequences)

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Dr. D. S. Gaikwad

Dr. D. B. Patil

Dr. D. B. Patil

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Vivekanand College, Kolhapur (Autonomous)

Annual Teaching Plan

Academic Year - 2018-19

B. Sc. Sem. II; M.Sc. I Sem II; M.Sc. II Sem. IV

Department- Chemistry

Name of the Teacher – Dr. D. S. Gaikwad

Month – January					
M.Sc.I Sem. II:- Course Title:- Organic Chemistry-II					
Lectures	Practicals	Total	Module Unit	Sub-Units Planned	
06	--	06	Study of following reactions	a) Study of following reactions Mechanism of condensation reaction involving enolates, Dieckmann, Wagner-Meerwein, Robinson annulation, Reimer-Tieman, Chichibabin, Pummerer, Payne rearrangement, SimonSmith, Ulmann, Mc-Murry, Dakin.	
M.Sc.II Sem IV :- Course Title:- Organic Chemistry					
Lectures	Practicals	Total	Module Unit	Sub-Units Planned	
12	32	44	Vitamins	Introduction of Vitamins, Classification and nomenclature of Vitamins, Sources of vitamins and their deficiency, Synthesis, structure.	
B.Sc.I Sem I:- Course Title:- Chemistry					
Lectures	Practicals	Total	Module Unit	Sub-Units Planned	
00	04	16	Academic Practicals	1. Organic spotting 2. Chromatography-I 3. Spot test	

Month – February					
M.Sc.I Sem. II:- Course Title:- Organic Chemistry-II					
Lectures	Practicals	Total	Module Unit	Sub-Units Planned	
08	--	08	Study of following reactions	Alkylation and Acylation Introduction, Types of alkylation and alkylating agents: C-Alkylation and Acylation of active methylene compounds and their applications.	
M.Sc.II Sem IV :- Course Title:- Organic Chemistry					
Lectures	Practicals	Total	Module Unit	Sub-Units Planned	
12	48	60	Vitamins	Biological functions of vitamin B1, B2, B5, B6 and Biotin (Vitamin H).	
			Alkaloids	Introduction, occurrence, isolation and functions of alkaloids, Structure, stereochemistry and synthesis of the following: Morphine, Reserpine.	

B.Sc.I Sem I:- Course Title:- Chemistry				
Lectures	Practicals	Total	Module Unit	Sub-Units Planned
00	04	16	Academic Practicals	1. Chemical Kinetics-II 2. Chromatography-II 3. Spot test-4,5,6 4. Estimation of Vinegar

Month – March

M.Sc.I Sem. II:- Course Title:- Organic Chemistry-II

: Lectures	Practicals	Total	Module Unit	Sub-Units Planned
08	--	08	Organometallic compounds	Study of Organometallic compounds Organo-lithium, organo cobalt, Ce, Ti, Use of lithium dialkyl cuprate, their addition to carbonyl and unsaturated carbonyl compounds.

M.Sc.II Sem IV :- Course Title:- Organic Chemistry

Lectures	Practicals	Total	Module Unit	Sub-Units Planned
16	32	48	Stereochemistry	Stereochemistry of compounds containing no chiral carbon atoms and diastereoisomerism (Geometrical isomerism). a) Stereochemistry of Allenes, Spiranes and Biphenyls
			Alkaloids	Introduction, occurrence, isolation and functions of alkaloids, Structure, stereochemistry and synthesis of the following: Atropine and Conin.

B.Sc.I Sem I:- Course Title:- Chemistry

Lectures	Practicals	Total	Module Unit	Sub-Units Planned
01	00	00	Overall Practical discussion	All practicals discussed.

Month – April

M.Sc.I Sem. II:- Course Title:- Organic Chemistry-II

: Lectures	Practicals	Total	Module Unit	Sub-Units Planned
08	--	08	Methodologies in organic synthesis	Ideas of syntheses and retrones, Functional group transformations and inter conversions of simple functionalities.

M.Sc.II Sem IV :- Course Title:- Organic Chemistry

Lectures	Practicals	Total	Module Unit	Sub-Units Planned
12	24	36	Stereochemistry	Assignment of configuration b) Configuration of diastereomers (Geometrical isomerism) based on physical and chemical methods.

Dipal

Dr. D. S. Gaikwad



Dr. D. B. Patil

Dr. D. B. Patil
Head

Dept. of Chemistry
Vivekanand College Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Annual Teaching Plan

Academic Year: 2018-19 Semesters: B.Sc. I (A+B+C), Sem-I Department: Chemistry

Subject: Chemistry Course Title: DSC-1002A: Inorganic & Organic Chemistry

Name of the Teacher: Dr. Sanjay Shivram Ankushrao

Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Induction	<ul style="list-style-type: none"> • General Introduction • Discussion on Course Structure • Discussion on Examination pattern • Discussion on Syllabus
06	-	06		
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Ionic Bonding	<ul style="list-style-type: none"> • General introduction • Types of Bond • Formation of ionic Solid • Factors Governing to Formation of ionic Solid
12	16	28		
Month: August			Module/Unit:	Sub-units planned
12	16	28	Ionic Bonding	<ul style="list-style-type: none"> • Born-Haber Cycle • Applications of Born-Haber Cycle • Fajan's Rule • Applications of Fajan's rule • % of Covalent Character in Ionic Comp.
Month: September			Module/Unit:	Sub-units planned
12	16	28	Covalent Bonding	<ul style="list-style-type: none"> • Valence Bond Theory: Introduction, Assumptions, Applications and Limitations. • 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)
Month: October			Module/Unit:	Sub-units planned
06	08	14	Covalent Bonding	<ul style="list-style-type: none"> • 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) • Valence Shell Electron Pair Repulsion (VSEPR) Theory H_2O, ClF_3, ICl_4^-

Name and Signature of Teacher

Name and Signature of HoD

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Vivekanand College, Kolhapur



Vivekanand College, Kolhapur (Autonomous)

Annual Teaching Plan

Academic Year: 2018-19 Semesters: B.Sc. I (A+B+C), Sem-II Department: Chemistry

Subject: Chemistry Course Title: DSC-1002B: Physical & Organic Chemistry

Name of the Teacher: Dr. Sanjay Shivram Ankushrao

Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Chemical Energetics	<ul style="list-style-type: none"> • Introduction • Enthalpy of reaction • Standard enthalpy changes • various types of enthalpy changes viz, enthalpy of formation, enthalpy of neutralization
06	-	06		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Chemical Energetics	<ul style="list-style-type: none"> • 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.
12	16	28		
Month: January			Module/Unit:	Sub-units planned
12	16	28	Thermodynamics	<ul style="list-style-type: none"> • Introduction, Spontaneous and nonspontaneous process with examples, Statements of second law of thermodynamics, Carnot's cycle and its efficiency
Month: February			Module/Unit:	Sub-units planned
12	16	28	Entropy and Third law	<ul style="list-style-type: none"> • 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
Month: March			Module/Unit:	Sub-units planned
06	08	14	Entropy and Third law	<ul style="list-style-type: none"> • Third law of thermodynamics, calculation of absolute entropies.

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Name and Signature of Teacher

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Name and Signature of HoD

Head
Dept. of Chemistry
Vivekanand College, Kolhapur



Annual Teaching Plan

Academic Year: 2018-19

Semesters: B.Sc. II, Sem-IV

Department: Chemistry

Subject: Chemistry

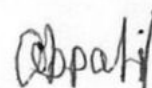
Course Title: Physical & Organic Chemistry

Name of the Teacher: Dr. Sanjay Shivram Ankushrao

Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Crystal Field Theory	<ul style="list-style-type: none"> • Introduction • Assumptions of CFT • Crystal field stabilization energy (CFSE)
2	-	02		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Crystal Field Theory	<ul style="list-style-type: none"> • Crystal field splitting of 'd' orbital in octahedral Complexes. • Crystal field splitting of 'd' orbital in Tetrahedral and square planar complex
4	-	04		
Month: January			Module/Unit:	Sub-units planned
4	-	04	Crystal Field Theory	<ul style="list-style-type: none"> • Comparison of CFSE for O_h and T_d complexes • Crystal field effects for weak and strong fields ligands, Tetrahedral symmetry, • Factors affecting the Magnitude of $10 Dq$, Spectrochemical series
Month: February			Module/Unit:	Sub-units planned
4	-	02		<ul style="list-style-type: none"> • Jahn-Teller distortion, • Limitations of CFT.
Month: March			Module/Unit:	Sub-units planned
-	-	-	-	-



Name and Signature of Teacher



Name and Signature of HoD

Head

Dept. of Chemistry

Vivekanand College, Kolhapur



Annual Teaching Plan

Academic Year: 2018-19

Semesters: B.Sc. III, Sem-V

Department: Chemistry

Subject: Chemistry

Course Title: Paper-X: Inorganic Chemistry
Paper-XII: Industrial Chemistry

Name of the Teacher: Dr. Sanjay Shivram Ankushrao

Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Hard and Soft Acids and Bases	<ul style="list-style-type: none"> 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.
06	-	06		
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Corrosion and Passivity	<ul style="list-style-type: none"> 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)
12	52	64		
Month: August			Module/Unit:	Sub-units planned
12	52	64	Corrosion and Passivity	<ul style="list-style-type: none"> 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
Month: September			Module/Unit:	Sub-units planned
12	52	64	Manufacturing of Heavy Chemicals	<ul style="list-style-type: none"> 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)
Month: October			Module/Unit:	Sub-units planned
06	13	19	Manufacturing of Heavy Chemicals	<ul style="list-style-type: none"> Manufacture of Sodium carbonate (Washing soda) (Na₂CO₃) i. Physico-chemical principles ii. Manufacture by Solvay process

Name and Signature of Teacher



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Vivekanand College, Kolhapur

Annual Teaching Plan

Academic Year: 2018-19

Semesters: B.Sc. III, Sem-VI

Department: Chemistry

Subject: Chemistry

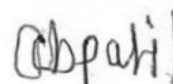
Course Title: Paper-XIV: Inorganic Chemistry
Paper-XVI: Analytical Chemistry

Name of the Teacher: Dr. Sanjay Shivram Ankushrao

Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Iron and Steel	<ul style="list-style-type: none"> 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.
09	-	09		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Bio-inorganic Chemistry	<ul style="list-style-type: none"> Introduction. Essential and trace elements in biological process. Metalloporphyrins with special reference to hemoglobin and myoglobin. Biological role of alkali and alkaline earth metal ions with special reference to Na⁺, K⁺ and Ca²⁺
12	52	64		
Month: January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Theory of Titrimetric Analysis	<ul style="list-style-type: none"> Introduction Neutralization Indicators (Acid-Base Indicators) Theory of indicators w.r.t. Ostwald's colour change interval and Ostwald's Quinoid theory Neutralization curves and choice of indicators for the following titration, i. Strong acid-strong base ii. Strong acid-weak base iii. Strong base - weak acid
12	52	64		
Month: February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Theory of Titrimetric Analysis	<ul style="list-style-type: none"> Complexometric titration: General account Types of EDTA titration Metallochromic indicators w.r.t. Eriochrome Black-T indicator
6	-	06		



Name and Signature of Teacher


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Vivekanand College, Kolhapur (Autonomous)

Annual Teaching Plan

Academic Year: 2018-19

Semesters: B.Sc. I (A+B+C), Sem-I

Department: Chemistry

Subject: Chemistry

Course Title: DSC-1002A: Inorganic and Organic Chemistry

Name of the Teacher: Dr. Mrs. Sarita Dattajirao Shinde

Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Periodicity of elements	<ul style="list-style-type: none"> • Introduction of the syllabus, • Introduction to the topic
4	-	4		
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Periodicity of elements	<ul style="list-style-type: none"> • a) Electronic configuration b) Atomic radii c) Ionic radii d) Ionization energy e) Electron affinity • f) Electronegativity g) Metallic characters h) Reactivity i) Oxidation state j) melting and boiling points k) chemical properties of s block elements
10	8	18		
Month: August			Module/Unit:	Sub-units planned
14	16	30	Periodicity of elements	<ul style="list-style-type: none"> • a) Electronic configuration b) Atomic radii c) Ionic radii d) Ionization energy e) Electron affinity • f) Electronegativity g) Metallic characters h) Reactivity i) Oxidation state j) melting and boiling points k) chemical properties of p block elements, • Oxoacids of nitrogen, phosphorus and sulphur (HNO₂, HNO₃, H₃PO₃, H₃PO₄, H₂SO₃, H₂SO₄)
Month: September			Module/Unit:	Sub-units planned
14	16	30	Molecular orbital theory (MOT)	<ul style="list-style-type: none"> • Introduction: Atomic Orbital's and Molecular Orbital's, LCAO method, formation of bonding, anti bonding and nonbonding molecular orbitals. • conditions of successful overlap, • Types of overlaps - S-S, S-Px, Px-Px, Py-Py/ Pz-Pz overlaps. • Bond order and its significance.
Month: October			Module/Unit:	Sub-units planned
14	16	30	Molecular orbital theory (MOT)	<ul style="list-style-type: none"> • Energy level sequence for molecular orbital when n=1 & 2. • MO diagrams for homonuclear diatomic molecules of 1st & 2nd period elements (He₂, Li₂, B₂, N₂, O₂). • Molecular orbital diagrams for heteronuclear diatomic molecules. (CO, NO, NO⁺)

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Annual Teaching Plan

Academic Year: 2018-19 Semesters: B.Sc. I (A+B+C), Sem-II Department: Chemistry

Subject: Chemistry Course Title: Chemistry Practicals

Name of the Teacher: Dr. Mrs. Sarita Dattajirao Shinde

Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	-	<ul style="list-style-type: none"> To study the reaction rate of hydrolysis of methyl acetate in presence of 0.5N HCl. To determine viscosity of given liquid A and B. To determine equivalent weight of Mg by Eudiometer. Estimation of Aniline
-	16	16		
Month: January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	-	<ul style="list-style-type: none"> Spot Tests Detection of following cations using spot tests: Cu^{2+}, Co^{2+}, Ni^{2+}, Fe^{3+}, Al^{3+}, Zn^{2+}, Mg^{+2}, Pb^{2+} Paper Chromatography Detection of following cations using Paper Chromatography: Cu^{2+}, Co^{2+}, Co^{2+}, Ni^{2+}, Ni^{2+}, Cu^{2+}
-	16	16		
Month: February			Module/Unit:	Sub-units planned
-	8	8	-	<ul style="list-style-type: none"> Determination of enthalpy of neutralization of HCl with NaOH Organic Spotting

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Annual Teaching Plan

Academic Year: 2018-19

Semesters: B.Sc. II, Sem-III

Department: Chemistry

Subject: Chemistry

Course Title: VI: Analytical Chemistry

Name of the Teacher: Dr. Mrs. Sarita Dattajirao Shinde

Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Inorganic Semi-Micro Qualitative Analysis	<ul style="list-style-type: none"> • Introduction, Theoretical principles involved in qualitative analysis, • To determine the unknown concentration of given coloured compounds ($\text{KMnO}_4/\text{CuSO}_4$) colorimetrically. • Estimation of (i) Mg^{2+} or (ii) Zn^{2+} by complexometric titrations using EDTA. • Preparation of Hexamine Nickel Chloride. • Estimation of total hardness of a given sample of water by complexometric titration. • Determination of the relative and absolute viscosity of a liquid or dilute solution using an Ostwald's viscometer. • To investigate the reaction between potassium per sulphate and KI (Equal Concentration) • To investigate the reaction between potassium persulphate and KI (Unequal Concentration) • To study the hydrolysis of methyl acetate in presence of HCl and H_2SO_4 and to determine relative strength.
2	32	34		
Month: August			Module/Unit:	Sub-units planned
4	40	44	Inorganic Semi-Micro Qualitative Analysis	<ul style="list-style-type: none"> • Applications of solubility product and common ion effect in separation of cations into groups, • Application of complex formation in a) Separation of II group into IIA and IIB sub-groups. b) Separation of Copper from Cadmium. c) Separation of Cobalt from Nickel. • Organic Spotting: Carboxylic acids, phenolic, aldehydic, ketonic, amide, nitro, amines • Estimate the amount of metal present in a given solution gravimetrically-Ni as Ni-DMG, Ba as BaSO_4, Fe as $\text{Fe}(\text{OH})_3$ • To determine volumetrically the amounts of sodium carbonate and sodium hydroxide present together in the given solution.
Month: September			Module/Unit:	Sub-units planned
4	32	36	Inorganic Semi-Micro Qualitative Analysis	<ul style="list-style-type: none"> • d) Separation of Cl⁻, Br⁻, I⁻. e) Detection of NO₂⁻, NO₃⁻ (Brown ring test), • Application of oxidation and reduction in a) Separation of Cl⁻, Br⁻, I⁻ in mixture b) Separation of NO₂⁻ and NO₃⁻ in mixture, Spot test analysis. • Determination of alkali content of antacid tablet using HCl. • To estimate H₂O₂ by Iodometric method. • Preparations of Ferrous ammonium sulphate (Mohr's salt). • Preparation of Potash Alum. • Estimation of Acetone • Estimations of Vitamin-C from tablets • Preparation of methyl orange • Preparation of p-nitro acetanilide
Month: October			Module/Unit:	Sub-units planned
-	40	40	-	<ul style="list-style-type: none"> • To determine Cell Constant of the given Conductivity cell and to verify Ostwald dilution law using acetic acid Solution Conductometrically. • To determine the normality of given strong acid and weak acid

				<p>by titrating it against strong base Conductometrically.</p> <ul style="list-style-type: none"> Semi-micro qualitative analysis using H₂S of mixtures - out of the following: <p>Cations: NH₄⁺, Cu²⁺, Cd²⁺, Fe³⁺, Al³⁺, Co²⁺, Cr³⁺, Ni²⁺, Mn²⁺, Zn²⁺, Ba²⁺, Sr²⁺, Ca²⁺, K⁺, Mg²⁺.</p> <p>Anions: CO₃²⁻, S²⁻, SO₃²⁻, S₂O₃²⁻, NO₃⁻, CH₃COO⁻, Cl⁻, Br⁻, I⁻, SO₄²⁻, C₂O₄²⁻, F⁻</p>
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Vivekanand College, Kolhapur (Autonomous)

Annual Teaching Plan

Academic Year: 2018-19 Semesters: B.Sc. II, Sem-IV Department: Chemistry

Subject: Chemistry Course Title: VIII: Inorganic Chemistry

Name of the Teacher: Dr. Mrs. Sarita Dattajirao Shinde

Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Transition Elements (3d series)	<ul style="list-style-type: none"> • Introduction • General group trends with special reference to electronic configuration, variable valency, colour, magnetic and catalytic properties and ability to form complexes.
4	-	4		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Lanthanoids and Actinoids	<ul style="list-style-type: none"> • A] Lanthanoids: Introduction, • electronic configurations, oxidation states, • colour and spectra, magnetic properties, lanthanide contraction, • Occurrence and separation of lanthanides (ion exchange method only).
8	32	40		
Month: January			Module/Unit:	Sub-units planned
10	40	50	Coordination Chemistry: A] Valence Bond Theory	<ul style="list-style-type: none"> • Definition and formation of co-ordinate covalent bond in $\text{BF}_3\text{-NH}_3$ and $[\text{NH}_4]^+$, • Distinguish between double salt and complex salt, Werner's theory i) Postulates, ii) theory as applied to cobalt amines complexes; • Description of the terms: ligands, co-ordination compounds, Coordination number; • IUPAC system of nomenclature, • Structural and stereoisomerism in complexes with coordination numbers 4 and 6; • Geometrical isomerism, Optical isomerism, structural isomerism- Ionization isomerism, hydrate isomerism, coordination isomerism, linkage isomerism and co-ordination position isomerism,
Month: February			Module/Unit:	Sub-units planned
8	40	48	Coordination Chemistry: A] Valence Bond Theory and B] Crystal Field Theory	<ul style="list-style-type: none"> • postulates of VBT, • Inner and outer orbital complexes w. r .t. coordination numbers 4 and 6; Drawbacks of VBT. • Assumptions of CFT, Crystal field splitting of 'd' orbital in octahedral, tetrahedral and square planar complex,
Month: March			Module/Unit:	Sub- units planned
5	-	5	Coordination Chemistry: B] Crystal Field	<ul style="list-style-type: none"> • Crystal field stabilization energy (CFSE), • Comparison of CFSE for Oh and Td complexes, • Crystal field effects for weak and strong fields

			Theory	ligands, Tetrahedral symmetry, • Factors affecting the Magnitude of $10 Dq$, Spectrochemical series, • Jahn-Teller distortion, Limitations of CFT
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Annual Teaching Plan

Academic Year: 2018-19

Semesters: B.Sc. III, Sem-V

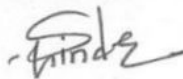
Department: Chemistry

Subject: Chemistry

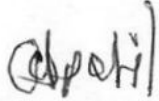
Course Title: X: Inorganic Chemistry

Name of the Teacher: Dr. Mrs. Sarita Dattajirao Shinde

Month: June			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Inorganic Polymers	<ul style="list-style-type: none"> • Introduction of the syllabus, • Introduction to the topic
2	-	2		
Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Inorganic Polymers	<ul style="list-style-type: none"> • Introduction, Basic concept and definition. • Classification of polymers - Organic and Inorganic polymers, Comparison between organic and inorganic polymers, Polymer backbone. • Homoatomic polymer containing – (i) Phosphorus. (ii) Fluorocarbons. •
6	28	34		
Month: August			Module/Unit:	Sub-units planned
8	35	43	Metals, Semiconductors and Superconductors	<ul style="list-style-type: none"> • Heteroatomic polymers - (i) Silicones (ii) Phosphonitrilic compounds. • Introduction, Properties of metallic solids. • Theories of bonding in metal. i) Free electron theory. ii) Molecular orbital theory (Band theory). •
Month: September			Module/Unit:	Sub-units planned
8	28	36	Metals, Semiconductors and Superconductors	<ul style="list-style-type: none"> • Classification of solids as conductor, insulators and semiconductors on the basis of band theory. • Semiconductors. Types of semiconductors - intrinsic and extrinsic semiconductors. Applications of semiconductors.
Month: October			Module/Unit:	Sub-units planned
6	14	22	Metals, Semiconductors and Superconductors	<ul style="list-style-type: none"> • Superconductors: Ceramic superconductors - Preparation and structures of mixed oxide $YBa_2Cu_3O_{7-x}$ 4.7 Applications of superconductors.


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Annual Teaching Plan

Academic Year: 2018-19

Semesters: B.Sc. III, Sem-VI


Department: Chemistry

Subject: Chemistry

Course Title: XIV: Inorganic Chemistry

Name of the Teacher: Dr. Mrs. Sarita Dattajirao Shinde

Month: November			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Inorganic Reaction mechanism	<ul style="list-style-type: none"> • Introduction • Classification of Mechanism
2	-	2		
Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Inorganic Reaction mechanism	<ul style="list-style-type: none"> • Study of Mechanism Association, dissociation, interchange and the rate determining steps • SN1 and SN2 reaction for inert and labile complexes • Mechanism of substitution in cobalt (III) octahedral complexes • Trans effect and its theories • Applications of trans effect in synthesis of Pt (II) complexes.
8	28	36		
Month: January			Module/Unit:	Sub-units planned
6	35	41	Surface Chemistry	<ul style="list-style-type: none"> • Introduction, Adsorption as a surface phenomenon (mechanism), • Definition of important basic terms: absorption, adsorption, adsorbant, adsorbate, interface etc., • Distinction between adsorption and absorption, Characteristics of adsorption,
Month: February			Module/Unit:	Sub-units planned
4	14	18	Surface Chemistry	<ul style="list-style-type: none"> • Factors affecting adsorption, Types of adsorption, • Distinction between physical (8) 18 adsorption and chemical adsorption, • Adsorption isotherms: Freundlich, Langmuir adsorption isotherm, • BET equation (derivation not expected), determination of surface area using Langmuir method and BET equations.
Month: March			Module/Unit:	Sub-units planned
-	48	48	-	Practical Examination


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Annual Teaching Plan

Academic Year: 2018-19

Semesters: M.Sc. I, Sem-I

Department: Chemistry

Subject: Chemistry

Course Title: CP-1131A: Inorganic Chemistry- I

Name of the Teacher: Dr. Mrs. Sarita Dattajirao Shinde

Month: July			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Introduction to Research Methodology and Nano materials	<ul style="list-style-type: none"> • Print: Sources of information: Primary, secondary, tertiary sources; Journals: Journal abbreviations, abstracts, current titles, reviews, monographs. • Digital: Web resources, E-journals, Journal access, Citation index, Impact factor, H-index, UGC infonet,
3	-	3		
Month: August			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Introduction to Research Methodology and Nano materials	<ul style="list-style-type: none"> • Search engines: Scirus, Google Scholar, ChemIndustry, Wiki- Databases, ChemSpider, Science Direct, SciFinder, Scopus. • Fundamentals of Nanoscience and Nanotechnology, • Classification of nanomaterials into 0D, 1D, 2D and 3D, • Relationship between dimension and shape of nanomaterials (Quantum dots,.
6	-	6		
Month: September			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Introduction to Research Methodology and Nano materials	<ul style="list-style-type: none"> • Quantum wires, Carbon nanotubes, Bucky balls, Fullerenes). • Introduction to size effect on electronic and optical properties (Quantum confinement), possible hazards and health effects of nanomaterials, • Preparative chemical methods of Nanomaterials: sol-gel, thermal, microwave, SILAR, chemical bath deposition, • Applications in the field of semiconductors and solar cells
6	-	6		

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Annual Teaching Plan

Academic Year: 2018-19

Semesters: M.Sc. I, Sem-II

Department: Chemistry

Subject: Chemistry

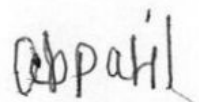
Course Title: CP 1131 B: Inorganic Chemistry - II

Name of the Teacher: Dr. Mrs. Sarita Dattajirao Shinde

Month: December			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Nuclear Magnetic Resonance (NMR) and Mass spectroscopy (MS)	<ul style="list-style-type: none"> • Introduction, principles, Magnetic and non magnetic nuclei, • precessional motion, Larmor frequency, absorption of radio frequency.
2	-	2		
Month: January			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Nuclear Magnetic Resonance (NMR) and Mass spectroscopy (MS)	<ul style="list-style-type: none"> • Instrumentation (FT-NMR). Sample preparation, • shielding and deshielding effects, chemical shift, internal standards, • factors influencing chemical shift, solvents used, peak area and protonratio, • anisotropic effect, spin-spin coupling, coupling constant, • applications to simple structural problems • Introduction, Principle, Instrumentation, working of mass spectrometer (double beam).
7	-	7		
Month: February			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Nuclear Magnetic Resonance (NMR) and Mass spectroscopy (MS)	<ul style="list-style-type: none"> • Determination of molecular formula, • Formation of different types of ions, • McLafferty rearrangements, metastable ions or peaks, • The nitrogen rule, • Mass spectrum of alkanes, alkenes, alkynes, cycloalkanes, cycloalkenes, cycloalkynes, and applications.
6	-	6		



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