

**K.T.S.P Mandal's
HutatmaRajguruMahavidyala
Rajgurunagar, Tal. Khed Dist. Pune
Syllabus Completion Report Year 2022-23**

Class: T. Y. B. Sc. Chemistry

Sem.-VI


Name of Paper: Chemistry of Soil and Agrochemicals **No. of Lectures allotted per week:** 03

Name of Teacher: Dr. P. S. Kulkarni


Sr. No.	Month	Name of Chapter	Topic Covered	No. of Lect. Taken
1.	Feb 22	Soil Chemistry	Role of agricultural chemistry Introduction to soil chemistry, definitions of soil, Soil components- Mineral component, organic matter or humus, soil atmosphere, soil water, soil microorganism Physical properties of soil- Soil texture, soil structure, soil colour, soil temperature, soil density, porosity of soil Surface soil and sub-soil, Functions of soil. Chemical properties of soil - Soil reactions, importance of soil reaction, factors controlling soil reactions, Buffer action, buffering capacity, importance of buffer reaction in agriculture, ion exchange and importance of ion exchange.	07
2.	March 23	Problematic Soil and Soil testing	Introduction to problematic soils. Acid soils- formation of acid soil, effect of soil acidity on plant, reclamation of acidic soil, application of lime in improving the acidity of soil, lime requirements. Alkali Soil- formation of alkali soil, reclamation of alkali soil. Classification of alkali soil- saline soil, alkali soil, saline alkali soil, non-saline alkali soil. Soil testing - Introduction, different methods of soil fertility evaluation. Objectives of soil testing.	06
3	March 23	Laboratory Methods of Soil Analysis	1. Determination of pH of soil 2. Determination of EC and TDS of soil 3. Determination of soil organic matter of soil. 4. Determination of available phosphorus from soil. 5. Determination of calcium and magnesium from soil by EDTA method. 6. Determination of carbonate and bicarbonates from soil.	12 L Conducted in Laboratory in Afternoon

4	April 23	Fertilizers and Manures	<p>Introduction, Classification of nitrogenous fertilizers, reaction of ammonium sulphate, urea as a fertilizer in soil. Nano fertilizers- Nano-Fertilizers for Sustainable Crop Production, Nano urea- preparation, forms and application of nano urea. Phosphatic fertilizers- Classification of phosphatic fertilizers, reactions of superphosphate as a fertilizer in soil. Potassic fertilizers - Classification of potassic fertilizers, reactions of potash fertilizer in soil.</p> <p>Complex fertilizers- Characteristics, advantages and disadvantages, Mixed fertilizers - Characteristics, advantages and disadvantages.</p> <p>Time and mode of applications of fertilizers in the solid and liquid form to plants. Factors affecting efficiency of fertilizers.</p> <p>Manures Introduction, Definition and classification of manures. Effect of bulky organic manures on soil. Farm yard manures (FYM), improved methods of handling FYM- Trench method for FYM, Factors affecting the composition of FYM, losses during the handling and storage of FYM, Gober gas-compost plant - construction and advantages.</p> <p>Biofertilizers - Definition, classification, role & advantages. Vermicompost - Preparation, effect of vermicompost on soil fertility.</p>	08
3.	April 23	Protection of Plants	<p>Classification of pesticides.</p> <p>5.2 Insecticide- Definition, Classification on the basis of mode of action and chemical properties. Inorganic insecticides - plants or animal origin insecticides- nicotine, pyrethrum, rotenone. Synthetic organic insecticides – a) Organochlorine insecticides - DDT, BHC, Aldrin and dieldrin. b) Organophosphorus insecticides – Parathion, Malathion, c) Carbamate insecticides – Carbaryl, Baygon.</p> <p>Fungicide – Definition and Classification of fungicides.</p> <p>Inorganic fungicide- Copper fungicides a) Bordeaux mixture, b) Copper oxychloride. Organic fungicides- Dithiocarbamate, Quinone</p>	06

			<p>fungicides, Heterocyclic fungicides.Synthetic fungicides.Herbicides- Definition, Classification on the basis of mode of action- Selective and non-selective herbicides, classification based on their effect on weeds-contact, systemic herbicides. Classification on the basis of their chemical structures. 5.5 Nano pesticides: Its Scope and Utility in Pest Management</p>	
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Syllabus Completion Report
M.Sc. –II (Organic Chemistry) A.Y.-2022-2023
Name of Paper-CHO-350 Organic Reaction Mechanism and Biogenesis
Section-I
Teacher Name: Dr. Kulkarni P. S.

Sr. No.	Month	Name of Chapter	Topic Covered	No. of Lect. taken
1	Oct.21	Methods for determining Reaction Mechanisms	Kinetic and non-kinetic methods	04
2	Nov.21	Free Radicals	Generation, stability, reactivity, Free radical substitution, addition to multiple bonds, radicals in synthesis, Inter- and intra-molecular bond formation via mercury hydride, tin hydride, thiol donors,	08
3	Dec.21	Free Radicals	cleavage of C-X, C-Sn, C-S, O-O bonds, Oxidative coupling, C-C bond formation in aromatics, S _N Ar reactions, Free Radicals in Organic Synthesis.	04
4	Jan.22	Linear Free Energy Relationships	Hammet plots, Hammet equation, substituent constants, reaction constants, use of Hammet plots,	06
5	Feb.22	Linear Free Energy Relationships	calculation of k and K, Deviations from straight line plots, Taft equation, solvent	04

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Syllabus Completion Report
M.Sc. –II (Organic Chemistry) A.Y.-2022-2023
Name of Paper-CHO-350 Biogenesis
Section-II
Teacher Name: Prof. Walunj K.A.

Sr. No.	Month	Name of Chapter	Topic Covered	No. of Lect. taken
1	Oct.21	Terpenoids	Mono-, Sesqui-, Di-, tri-terpenoids and cholesterol,	08
2	Nov.21	Alkaloids	Derived from ornithine, lysine, nicotinic acid, tyrosine and tryptophan.	06
3	Dec.21	The Shikimate pathway	Cinnamic acids, lignans and lignin, coumarins, flavonoids and stilbens.	08
4	Jan.22	The Shikimate pathway	isoflavanoids and terpenoidquinones.	08
5	Feb.22	A case study	Alkaloids isolated from the Roots of Piper nigrum	04



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Syllabus Completion Report
M.Sc. –II (Organic Chemistry) A.Y.-2022-2023
Name of Paper- CHO-351: Structure Determination of Organic Compounds by
Spectroscopic Methods
Section-I
Teacher Name: Dr. Walunj Y.S.**

Sr. No.	Month	Name of Chapter	Topic Covered	No. of Lect. taken
1	Oct.21	NMR in Stereochemistry Determination	Homotopic, enantiotopic and distereotopic protons, Chemical and Magnetic equivalence; First and second order splitting, Complex multiplicity patterns and coupling constants in asymmetric compounds; Simplification of complex spectra, NOE, Diastereomerism, Atrop or axial chirality, % Enantiomeric excess, chiral NMR solvents etc in structure elucidation.	10
2	Nov.21	13C NMR spectroscopy	13C NMR spectroscopy- APT, DEPT and INEPT	06
3	Dec.21	15N, 19F and 31P NMR spectroscopy	Fundamentals and applications in structure elucidation of organic compounds, catalysts and biomolecules.	04
4	Jan.22	2D NMR spectroscopy	a) Homonuclear: COSY, TOCSY, 2DINADEQUATE, 2D- ADEQUATE, NOESY, ROESY	04
5	Feb.22	2D NMR spectroscopy	(b) Heteronuclear: HSQC, HMQC, HMBC [8 L]	04


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M.Sc. –II (Organic Chemistry) A.Y.-2022-2023
Name of Paper-CHO-351 Mass Spectrometry
Section-II
Teacher Name: Prof. Walunj K.A.**

Sr. No.	Month	Name of Chapter	Topic Covered	No. of Lect. taken
1	Oct.21	Mass Spectrometry	Principle, ionization methods like EI, CI, ES, MALDI and FAB Fragmentation of typical organic compounds, stability of fragments,	06
2	Nov.21	Mass Spectrometry	Rearrangements, factors affecting fragmentation, ion analysis, ion abundance, High-Resolution mass spectrometry in determination of molecular formula.	06
3	Dec.21	Applications of Mass Spectrometry	Determination of the elemental composition, Isotopic Abundance in structure establishment	04
4	Jan.22	Analysis of Biomolecules	Proteins and Peptides, Oligonucleotides and Oligosaccharides	08
5	Feb.22	Problems solving	Structure elucidation using UV, IR, 1D (¹ H and ¹³ C) NMR and 2D NMR (¹ H- ¹ H, ¹³ C- ¹ H COSY /HETCOR only), APT, DEPT and MS data as well as spectra.	12

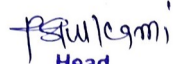
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M.Sc. –II (Organic Chemistry) A.Y.-2022-2023
Name of Paper-CHO-352(Organic Stereochemistry)
Section-I
Teacher Name: Prof. Walunj K.A.

Sr. No.	Month	Name of Chapter	Topic Covered	No. of Lect. Taken
1	Oct.21	Actual Shape of six membered rings & its relation to properties & reactivity.	Conformations of polysubstituted cyclohexane, six membered rings with SP ² carbon, heterocycles with N and O, anomeric effect, stereochemical principles involved in reactions of six membered rings and other than six membered rings, concept of I-Strain. Stereochemistry of a polymer chain – Types and examples of Tacticity Decalols, Decalones, Octahydronaphthalenes, decahydroquinolines	10
2	Nov.21	Stereochemistry of fused and bridged ring systems	Nomenclature, synthesis; stereochemical aspects of Perhydrophenanthrene, Perhydroanthracene, hydrindane, Steroids; Bridged system (bi, tri and polycyclo system) including heteroatoms, Bredt's Rule.	05
3	Dec.21	Conformations of following compounds with justification of each	cis and trans -1,3- and 1,4-di-t-butyl-cyclohexanes; Cis-4-di-t-butylcis-2,5-dihydroxycyclohexane; Twistane; bicyclo- [2.2.2]octane; Trans-anti-trans Perhydro-anthracene and the lactone; cyclohexane-1,4-dione; 1,2,2,6,6-penta-methyl-4hydroxy-4-phenylpiperidine; ψ -tropine; 2-hydroxy-2-phenyl quinolizidine; 4-t-butyl-4methyl-1,3-dioxane; cis and trans-2,5-di-t-butyl-1,3-dithianes; cis-2,5-di-t-butyl-1,3,2dioxaphosphorinan-2-one.	04
4	Jan.22	Determination of configuration by using Cram's model	Cram's rule, Cram's cycle model, Cram's dipolar model, Felkin-Anh Model.	05
5	Feb.22	Racemic Modification	Resolution and analysis of stereomers - formation of racemization and methods of resolution.	05

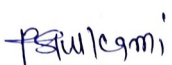

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M.Sc. –II (Organic Chemistry) A.Y.-2022-2023
Name of Paper-CHO-352 Asymmetric Synthesis
Section-II
Teacher Name: Prof. Pawar R.Y

Sr. No.	Month	Name of Chapter	Topic Covered	No. of Lect. taken
1	Oct.-21	Introduction of Asymmetric Synthesis.	Asymmetric Synthesis, Definition of Chiral pool and Chiral auxiliaries with examples. Simple derivatives of amino acids, chiral approach of asymmetric synthesis, Alkylation of enolates by using chiral auxiliary, Diel's Alder Reaction,	08
2	Nov.-21	Asymmetric Organocatalysis	Corey -Bakshi Shibata Catalyst, Asymmetric Epoxidation by using MnSalen complex, (DHQ)2PHAL, (DHQD)2PHAL,	06
3	Dec.-21	Asymmetric Aldol Reaction,	Chiral Auxiliary controlled Aldol reaction The Evans aldol reaction, Aldol reaction catalyzed by proline Enantioselective, diastereoselective and double diastereoselective Aldol reactions.	06
4	Jan.-21	Transition Metal-Catalyzed Homogeneous Asymmetric Hydroxylation and Epoxidation	Asymmetric Sharpless epoxidation, DIPT Synthesis of L-Menthol from R-citronellal, Synthesis of Chloramphenicol, Asymmetric conjugate addition by using BINAP, Noyori Hydrogenation H ₂ Pd/c, OSO ₄	06
5	Feb.-22	Asymmetric Phase-Transfer and Ion Pair Catalysis	Asymmetric hydrogenation, Asymmetric catalyzed asymmetric hydrogenation of carboxylation	04


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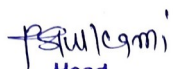
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Syllabus Completion Report
M.Sc. –II (Organic Chemistry) A.Y.-2022-2023
Name of Paper-CHO- 353 Designing Organic Synthesis & Heterocyclic Chemistry
Section-I & II
Teacher Name: Prof. Pawar R.Y
Section-I

Sr. No.	Month	Name of Chapter	Topic Covered	No. of Lect. taken
01	Oct.-21	1. Concepts of Retro synthesis	Retrosynthetic analysis, disconnection approach, Synthons, multiple step synthesis, functional group interconversion, , 1,5 related functional group disconnection.	04
03	Dec.-21	2. Application of Retrosynthetic Approach:	Umpolung, convergent synthesis, special methods for small rings, Heteroatom and Heterocyclic compounds, problems.	08
04	Jan.-22	2. Application of Retrosynthetic Approach:	Retrosynthesis and synthesis of following Molecules: Strychnine, Reserpine, Thienamycin, Asteltoxin, Indolizomycin, Erythronolide	06
05	Feb.-22	Application of Retrosynthetic Approach:	Retrosynthesis and synthesis of following Molecules Asteltoxin, Indolizomycin, ErythronolideS	04


SECTION-II

Sr. No.	Month	Name of Chapter	Topic Covered	No. of Lect. taken
01	Oct.-21	Synthesis, reactions and structural effects of heterocyclic rings	Systematic nomenclature (Hantzsch – Widmann system) for monocyclic fused , bridged heterocycles , Tautomerism , in aromatic heterocycles , Strain bond angles , Torsional strain & their consequences in small ring heterocycles .	08
02		General chemical	Biological systems (Anthocyanins, Flavones,	

	Nov.-21	behaviour of heterocyclic compounds and their applications.	Neurotransmitters), Natural Products (Alkaloids: Nicotin, Quinine), Drugs and Medicines (Omeprazole, Amlodipine, Cilostazol)	12
03	Dec.-21	Five & six membered heterocycles Synthesis & Reactivity.	Common Methods in Ring Synthesis of Aromatic Heterocyclic Systems: Typical ring synthesis involving C – Heteroatom, C – C bond formations, Electrocyclic processes in heterocyclic Synthesis: 1,3 -dipolar cycloadditions producing five - membered heterocycles, Nitrenes in heterocyclic synthesis, Palladium catalysis in the synthesis of Benzo - Fused heterocycles, Fischer synthesis, Epoxidation, Use of Sulphur Ylides, Azides for small rings	10
04	Jan.-22	Three and four, Five-membered and benzo-fused five membered heterocycles Synthesis & Reactivity.	Aziridines, Oxiranes, Thirienes, Azetidines, Oxitanes and Thietanes ,Oxazole,Isoxazole, Thiazole, Pyrazole, Imidazole , Benzothiazole ,Benzimidazole , Indole , Benzofuran .	06
05	Feb.-22	Six membered and benzo-fused six membered heterocycles: Synthesis & Reactivity.	Six membered and benzo-fused six membered heterocycles: Pyrazine, Pyridazine, Pyrimidine, Quinazoline, Quinoxaline, Aziridines, Quinoline	04


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M.Sc. –II (Organic Chemistry) A.Y.-2022-2023
Name of Paper-CHO- 354 Solvent Free Organic Synthesis
Teacher Name: Prof. Pawar R.Y & Prof. Walunj K.A.

Sr. No.	Month	Name of Experiment's	No. of hours
1	16/11/22	Solvent Free Carbon–Carbon Bond Formation by using Pechmann reaction	04
2	17/11/22	To Study C-C bond formation using Claisen condensation reaction	04
3	18/11/22	To study phenol bromination using NBS	04
4	22/11/22	To Study C-C bond formation using Claisen condensation reaction (Diethyl malonate)	04
5	23/11/22	To Study C-C bond formation using Biginelli reaction	04
6	23/11/22	To Study C-C bond formation using Biginelli reaction (KSF)	04
7	24/11/22	To Study C-C bond formation using Pinacol coupling reaction	04
8	29/11/22	To Study C-C bond formation using Knoevenagel reaction	04
9	13/12/22	To Study C-N bond formation using Beckmann rearrangement	04
10	14/12/22	2-Hydroxybenzaldehyde oxidation using urea-hydrogen peroxide complex	04
11	15/12/22	To Study C-C bond formation using calix [4] resorcinarene	04
12	20/12/22	Alumina-supported permanganate oxidation	04
13	27/12/22	Pyrocatechol protection using phenylboronic acid	04
14	28/12/22	2-Hydroxybenzaldehyde oxidation using urea-hydrogen peroxide Complex	04
16	29/12/22	To Study C-C bond formation using Knoevenagel reaction	04
17	04/01/23	To Study C-C bond formation using Reformatsky reaction	04


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M.Sc. –II (Organic Chemistry) A.Y.-2022-2023
Subject-CHO-450 Chemistry of Natural Products
Teacher Name: Prof. Pawar R.Y.

Sr. No.	Month	Name of Chapter	Topic Covered	No. of Lect. taken
1.	March-2023	1. Understanding & planning of total synthesis while maintaining the stereochemistry.	SECTION-I 1. A case study : Longifolene 2. Synthesis of Longifolene by J. E. McCurry & S. J. Isser 3. Synthesis of Longifolene by S.Karimi & P.Tavares 4. Synthesis of Longifolene by E.J. Corey , R.B.Mitra& P. A.Vatakencherry 5. Synthesis of Longifolene by R.A.Volkman , G.C. Andrew's& W. S. Johnson 6. Synthesis of Longifolene by W. Oppolzer & T. Gödel 7. Synthesis of Longifolene by A.G. Schultz & S.Puig 8. Synthesis of Longifolene by B.Lei&A.G.Fallis	12
2.	April-2023	2.Total Synthesis	1. HirsutelloneB (Angew.Chem.Int.Ed.2009, 48,6870–6874.) Introduction , The Nicolaou synthesis (+) Hirsutellone B i) Synthesis of ring C ii) Synthesis of decahydro Fluorene skeleton iii) Synthesis of Intramolecular Diel's Alder reaction adduct iv) Synthesis of γ -siloxy nitrile 2. Ribisins A and B:(J.Org.Chem. 2019,84,15165–15172) 1. Introduction 2. Structures of Ribisins A and B 3. Total synthesis of Ribisins A 4. Total synthesis of Ribisins B 3. Subincanadine E:(J.Org.Chem.2017,82,11126-11133) 1. Introduction 2. Structures of Subincanadine E 3. Retrosynthetic analysis of Subincanadine E 4. Synthesis of Subincanadine E 5. Mechanism of coupling of Grignard reagent with maleimide & allylic rearrangement & pictet-spenger cyclization	04 04 04
3.	May-2023	3.Total Synthesis Pinnaic Acid	SECTION-II A) Pinnaic acid 1. Introduction 2. Structures 3. Retro synthesis of Pinnaic acid	06

			<p>4. Total synthesis of Pinnaic acid Using 1-Pyrolidine ,1-cyclopentene</p> <p>5. Synthesis of Piperidine derivative from carbamate</p> <p>6. Synthesis of Die none derivative from Piperidine derivative</p> <p>References:</p> <p>1. Angew. Chem.Int. Ed. 2001, 40 (23), 4450-4452.</p> <p>2. Angew. Chem.Int.Ed. 2001, 40,(23), 4453-4456.</p> <p>3. Angew. Chem.Int. Ed.2007, 46,5746-5</p>	
4.	May-2023		<p>A) Vannusals</p> <p>1. Introduction</p> <p>2. Structures</p> <p>3. Retro synthesis of Pinnaic acid</p> <p>B) Total synthesis of Vannusals</p>	06


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Syllabus Completion Report
M.Sc. –II (Organic Chemistry) A.Y.-2022-2023
Subject-CHO-451- Organometallic Reagents in Organic Synthesis

Teacher Name: Prof. Jasud J.S.

Sr. No.	Month	Name of Chapter	Topic Covered	No. of Lect. Taken
1.	April-2023	2. C-C coupling reactions	SECTION-I Transition metal complexes in organic synthesis; Pd, Ni, Ru, Fe, Ir and Cu only (C-C, CN, C-O bond formation reactions with catalytic cycle, ligand and % mole concepts)	20 L
2.	May-2023	2. C=C formation reactions:	Wittig, Horner-Wordworth-Emmons, Shapiro, Bamford Stevens, McMurry, Julia-Lythgoe and Peterson olefination reactions	10L


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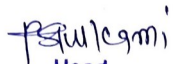



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Syllabus Completion Report
M.Sc. -I (Organic Chemistry) A.Y.-2022-2023
Subject-CHO-452 Concepts & Applications of Medicinal Chemistry
Prof. Walunj K.A.

Sr.	Month	Name of	Topic Covered	No. of
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No.		Chapter		Lect. taken
1.	March-2023	1.Introduction to Medicinal Chemistry	Introduction to Peptides and proteins Proteins as biological catalyst Nucleic acids, Metabolism, Chemistry of cofactors/coenzymes, Chemistry of TPP, Folic Acid and other vitamins, Principle of drug design, Chemistry of diseases and Drug development ,Proton pump inhibitors and Problem solving.	06L
2.	April-2022	2. Peptides	Sequencing and applications in therapeutics, Solution phase and solid phase peptide synthesis and Modern techniques for biomolecules and disease diagnosis	04L
3.	April-2022	3. Introduction to medicinal Chemistry.	History, drug targets, Drug discovery, design and development, Case Study : Design of Oxamniquine.	04L
			Pharmacokinetics and Pharmacodynamics Of drug: Drug absorption, distribution, metabolism, elimination and toxicity, drug metabolism, biotransformation, Drug receptor interactions, Hansch Equation and significance of terms involved in it	04L
4	May-2022	1. Structure and activity Relationship	QSAR, Applications of SAR and QSAR in drugdesign, physio-chemical parameters lipophilicity, partition coefficient, electronic ionization constant, Case Study: Statins	09L
5	May-2022	4.Actual Study of Drug molecule	Introduction, Developments, SAR, Mode of action, limitations and adverse effect ofAnti-infective Agents, Beta lactam antibacterial agents (Penicillins, Cephalosporins),Tetracyclins,Macrolides,Chloramphenicol,Polyenes,Amphotrecin-B,Azoles,Amantadine,Acyclovir, Quinine,	02L
6	May-2022		Quinolines, Quinolones, Refamycine, Sulphonamides	06L


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M.Sc. –II (Organic Chemistry) A.Y.-2022-2023

CHO-453: Practical-III: Select ANY TWO Section I, II and III

Section-I: Ternary Mixture Separation


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Prof. Pawar R.Y. & Prof. Walunj K.A.

No.	Sr.	Month & Date	Name of Experiment's	
1		17/03/2022	a) Salicylic acid b) M-nitro aniline c) Acetanilide	04
2		31/03/2022	a) o-chlorobenzoic acid b) Thiourea c) m-dinitrobenzene	04
3		23/03/2022	a) Oxalic acid b) Salicylic acid c) P-nitrotoluene	04
4		01/04/2022	a) O-cresol b) Methyl acetate c) Nitrobenzene	04
5		24/03/2022	a) B-naphthol b) Urea c) Ethyl benzoate	04
6		31/03/2022	a) Urea b) Salicylic acid c) M-nitroaniline	04
7		30/03/2022	a) Cinnamic acid b) O-chlorophenol c) Aniline	04
8		25/03/2022	a) P-chlorophenol b) N,N-Dimethyl aniline c) Acetophenone	04
9		26/03/2022	a) Benzoic acid b) P-nitroaniline c) Acetanilide	04
10		23/03/2022	a) Phenyl acetic acid b) P-Chloroaniline c) Benzophenone	04
11		28/03/22	a) Salicylic acid b) M-dinitro benzene c) Chloroform	04
12		29/03/22	a) Ethyl acetate b) M-Chloroaniline c) Ethyl benzoate	04


Section-II: Carbohydrates Synthesis and Isolation Natural Products

Sr. No.	Month & Date	Name of Experiment's	
1	09/05/22 10/05/22	Unit I: Carbohydrate Synthesis 1. Synthesis and structural determination of α - and β -D-glucose penta-acetate.	12

	11/05/22	2. Selective deacylation of α - and β -D-glucosepenta-acetate. 3. Benzoylation of D-glucose. To D-glucosepenta-benzoate.	
2	12/05/22	Unit II : Isolation of pigments from the natural products 1. Orange Marigold 2. Rose 3. Hibiscus	12
3	13/05/22	Unit III: Isolation of essential oils from the natural products 1. Ginger 2. Lemongrass 3. Garlic	12


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Rajgurunagar, Tal. Khed, Dist. Pune
Syllabus Completion Report
M.Sc. –II (Organic Chemistry) A.Y.-2022-23
CHO-454: Practical-II: Convergent and Divergent Organic Synthesis
Prof. Pawar R.Y. & Prof. Walunj K.A.

Sr. No.	Month & Date	Name of Experiment's	No. of Lect. Taken
		SET-IV: A). Convergent Synthesis 2 (Three Stage Synthesis)	
1	10/05/22	Stage II: 4-Nitrochlorobenzene into 4-aminochlorobenzene (Reduction by using hydrazine)	04
2	10/05/22	Stage III: Quinoline synthesis by using acetophenone, 4-amino chlorobenzene and styrene (One pot synthesis: [3 + 2 + 1] cycloaddition reaction)	04
		Divergent Synthesis-4 (5 Single Stage Synthesis from Acetophenone)	
3	10/05/22	1. Acetophenone to Ethylbenzene by Wolf Kishner reduction	04
4	30/03/22	2. Acetophenone to Chalcone using aromatic aldehyde	04
5	31/03/22	3. Acetophenone into Schiff base using aromatic amine	04
6	10/05/22	4. Acetophenone to m-Nitroacetophenone by nitration	04
		SET-II A). Convergent Synthesis 2 (Three Stage Synthesis)	
7	05/04/22	1. Stage I: 4-Nitro toluene to 4-amino toluene (Reduction by using Sn/HCl)	04
8	26/04/22	2. Stage II: Phenol into 2-hydroxy benzaldehyde (Reimer-Tiemann reaction)	04
9	23/04/22	3. Stage III: Synthesis of amidoalkyl-2-naphthols from β -Naphthol, 4-aminotoluene and of 2-hydroxybenzaldehyde (One pot synthesis: MCR)	04
		B). Divergent Synthesis (5 Single Stage Synthesis from β-Naphthol)	
10	27/04/22	1. β -Naphthol to Synthetic dye (By diazonium coupling)	04
11	29/04/22	2. β -Naphthol to β -Naphthyl methyl ether (Methylation reaction)	04
12	09/05/22	3. β -Naphthol to (\pm) Binol then Resolution of Binol (Resolution technique)	04
		SET-III A). Convergent Synthesis-3 (Three Stage Synthesis)	
13	11/05/22	1. o-Anisidine to 2-methoxy-4-nitroaniline	04
		B). Divergent Synthesis-3 (5 Single Stage Synthesis from Salicylaldehyde)	
14	29/04/22	2. Salicylaldehyde to Salicylaldehyde phenyl hydrazine	04
15	09/05/22	3. Salicylaldehyde to o-Formyl phenoxyacetic acid	04


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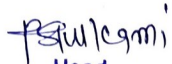
Rajgurunagar, Tal. Khed Dist. Pune

Syllabus Completion Report 2022-23 Class: T. Y. B. Sc. Chemistry, Sem.-V


Name of Paper: Introduction of Medicinal Chemistry No. of Lectures allotted per week: 03

Name of Teacher: Prof. P. S. Kulkarni

Sr. No.	Month	Name of Chapter	Topic Covered
1	Aug-22 Sep-22	An Introduction to Drugs, their Action and Immunobiologicals	Introduction, Need of new drugs, Historical background of drug discovery and design, Sources of drugs, Classification of drugs, Introduction to drug action B. Immunobiologicals: Vaccines: Introduction, Methods of vaccine production: Inactivated pathogens, Live/Attenuated Pathogens and Cellular Antigen from a pathogen, SARS-CoV-19
2	Sep-22 Oct-22	Bio-physicochemical Properties in Drug Action and Design	Introduction, Acidity/Basicity, Solubility, Ionization, Hydrophobic and hydrophilic properties, Lipinski Rule, Terminology in Medicinal Chemistry: Pharmacology, Pharmacophore, Pharmacodynamics, Pharmacokinetics, metabolites, antimetabolites and therapeutic index. Importance of stereochemistry in drug action (Example: Ibuprofen), Concept of rational drug design: Structure activity relationship, Drug-receptor understanding
3.	Oct-22 Nov-22	Drugs for Infectious Diseases	Introduction, Structures, Mode of Action and Applications: A. Antimicrobial Agents: Classification on i) Type of action: Bacteriostatic and Bactericidal ii) Source (Natural, Synthetic and Semisynthetic) iii) Spectrum of activity: Narrow and Broad Spectrum iv) Chemical structure: β -lactams (Penicillin), Macrolides (Azithromycin), Sulphonamides (Sulfadiazine), and Tetracyclins (Chlortetracycline) B. Anti-fungal and anti-viral agents: Example: Amphotericin-B, Acyclovir
4.	Dec-22	Drugs for Non-infectious diseases	Introduction, Structures, Mode of Action, and Applications: A. i) Anti-inflammatory and Analgesic Agents: Example: Aspirin, Paracetamol, and Ibuprofen, ii) Psychoactive Agents: Sedatives and Hypnotics: Example: Benzodiazepines, B. Metallodrugs as Chemotherapeutic Agents: Examples: Aluminium based antacids, Salvarsan, Cis Platin, and Transition Metal Complexes


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