Cluster Elective –PAPER – VIII-A-1

ST.JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS), VISAKHAPATNAM

V SEMESTER CHEMISTRY 3 Hrs/ Week

CH A1 6201 (3) PHARMACEUTICAL AND MEDICINAL CHEMISTRY Max.Marks: 60

w.e.f 2017-2018 ('15AC' Batch) SYLLABUS

OBJECTIVES: To enable the students to gain knowledge

1. By understanding the terminology of pharmaceutical chemistry
2. Understand the fundamental aspects of synthetic drugs its morphology, physiological activity of some important drugs.
3. About the importance of Pharmacodynamic, HIV-AIDS drugs.

UNIT-I

1. **Pharmaceutical chemistry:** Terminology, Pharmacy, Pharmacology, Pharmacophore, Pharmacodynamics, Pharmacokinetics (ADME, Receptors - brief treatment) Metabolites and Anti metabolites.
2. **Drugs:** Nomenclature, Chemical name, Generic name and trade names with examples Classification: Classification based on structures and therapeutic activity with one example each, Administration of drugs

UNIT-II

3. **Chemotherapeutic Drugs:** Synthesis and therapeutic activity of the compounds Sulphadrugs (Sulphamethoxazole) 2.Antibiotics - β-Lactam Antibiotics, Macrolide Antibiotics, 3. Anti malarial Drugs (chloroquine)
4. **CNS Drugs:** Definition-classification-Examples- Psycho therapeutic Drugs: 1. Antipyretics: Synthesis and therapeutic action of Paracetamol and structures of Hypnotics, Tranquilizers (Diazepam) Levodopa

UNIT-III

5. **Pharmacodynamic Drugs:** 1. Antiasthma Drugs (Solbutamol) 3. Antianginals (Glycerol Trinitrate) 4. Diuretics (Frusemide)
6. **6. HIV-AIDS:** Immunity - CD-4cells, CD-8cells, Retro virus, Replication in human body, Investigation available, prevention of AIDS, Drugs available - examples with structures: PIS: Indivanir (crixivan), Nelfinavir(Viracept).

List of Reference Books:

1.Medicinal Chemistry by Dr. B.V.Ramana
2.Synthetic Drugs by O.D.Tyagi & M.Yadav

3.Medicinal Chemistry by Ashutoshkar

4.Medicinal Chemistry by P.Parimoo

5.Pharmacology& Pharmacotherapeutics R.S Satoshkar & S.D.Bhandenkar

6.Medicinal Chemistry by Kadametal P-I & P.II

7.European Pharmacopoeia

ST.JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS) , VISAKHAPATNAM

VI SEMESTER **CHEMISTRY** **TIME: 4 Hrs/Week**

CH AI6251(2) **SYNTHESIS OF ORGANIC COMPOUNDS** **Max. Marks : 100**

w. e .f 2017-2018'AC' batch PRACTICAL SYLLABUS

OBJECTIVE: To enable the students to apply the principles of organic synthesis for the synthesis of organic compounds with emphasis on yield

1. Preparation of Aspirin
2. Preparation of Acetanilide
3. Preparation of Paracetamol
4. Preparation of Barbutiric Acid
5. Preparation of Phenyl azo β - Naphthol
6. Preparation of S – Benzyl iso thio uronium chloride.

REFERENCES :

1. Practical Organic Chemistry – G Mann & B.C.Saunders ELBS & Long man Group Ltd – IV Edition.

2. Vogels's T.B. of Practical Organic Chemistry B S Furnis A J Hannaford, PWG Smith & AR Tatchell – ELBS V Edition.

Cluster Elective –PAPER – VIII-A-2

ST.JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS), VISAKHAPATNAM

V SEMESTER **CHEMISTRY** **3 Hrs/ Week**

CH A26202(3) **GREEN CHEMISTRY** **Max. Marks: 60**

w.e.f 2017-2018 ('15AC' Batch) **SYLLABUS**

OBJECTIVES: To enable the students to –

1. To gain knowledge and to help in facing biggest challenges of 21st century by studying Green strategies enhance the environmental quality. To emphasize the basic green chemistry principles & green reactions.
2. A critical insight into green methods adopting green catalysts and green solvents
3. Alternative methods Microwave and Ultrasound conditions for some popular named reactions

UNIT-I

1. **Green Chemistry:** Introduction- Definition of green Chemistry, need of green chemistry, basic principles of green chemistry. Green synthesis- Evalution of the type of the reaction i) Rearrangements (100% atom economic), ii) Addition reaction (100% atom economic). Organic reactions by Sonication method: apparatus required examples of sonochemical reactions (Heck, Hundsdiecker and Wittig reactions).
2. **Selection of solvent:** i) Aqueous phase reactions ii) Reactions in ionic liquids, Heckreaction, Suzuki reactions, epoxidation. iii) Solid supported synthesis. **Super critical CO_2**: Preparation, properties and applications, (decaffeination, dry cleaning)

UNIT-II

3. **Microwave and Ultrasound assisted green synthesis**: Apparatus required, examples of MAOS (synthesis of fused anthro quinones, Leukart reductive amination of ketones) - Advantages and disadvantages of MAOS. Aldol condensation-Cannizzaro reaction-Diels-Alder reactions-Strecker's synthesis

4. **Green catalysis:** Heterogeneous catalysis, use of zeolites, silica, alumina, supported catalysis- biocatalysis: Enzymes, microbes Phase transfer catalysis (micellar/surfactant) Crown Ethers

UNIT-III

5. **Examples of green synthesis / reactions and some real world cases**: 1. Green synthesis of the following compounds: adipic acid , catechol , disodium imino di acetate (alternative Strecker's synthesis) 2. Microwave assisted reaction in water – Hoffmann elimination – methyl benzoate to benzoic acid – oxidation of toluene and alcohols.
6. **Microwave assisted reactions in organic solvents.** Diels-Alder reactions and decarboxylation reaction. 3. Ultrasound assisted reactions – sonochemical Simmons – Smith reaction(ultrasonic alternative to iodine)

Reference books:

1. Green Chemistry Theory and Practice. P.T.Anatas and J.C. Warner

2. Green Chemistry V.K. Ahluwalia Narosa, New Delhi.

3. Real world cases in Green Chemistry M.C. Cann and M.E. Connelly

4. Green Chemistry: Introductory Text M.Lancaster: Royal Society of Chemistry (London)

5. Green Chemistry: Introductory Text, M.Lancaster

6. Green Chemistry: Environmental friendly alternatives R S Sanghli and M.M Srivastava, Narosa Publications

ST. JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS) VISAKHAPATNAM

VI SEMESTER **CHEMISTRY** **TIME: 3Hrs/week**

CH A26252(1) **REACTIONS WITH GREEN PROCEDURES** **Max. Marks: 50**

w. e .f 2017-2018'AC' batch PRACTICAL SYLLABUS

OBJECTIVE: To enable the students to apply the principles of green chemistry for the analysis and synthesis of organic compounds with emphasis on yield

1.Green procedure for organic qualitative analysis: Detection of N, S and halogens
2.Acetylation of 1^0 amine by green method: Preparation of acetanilide
3. Rearrangement reaction in green conditions: Benzil-Benzilic acid rearrangement
4. Electrophilic aromatic substitution reaction: Nitration of phenol
5. Radical coupling reaction: Preparation of 1,1-bis -2-naphthol
6. Green oxidation reaction: Synthesis of adipic acid
7. Green procedure for Diels Alder reaction between furan and maleic anhydride

REFERENCES :

1. Green Chemistry Theory and Practice. P Anatas and J C Warner. Oxford Science Publications, 1998.

2. Monograph on Green Chemistry Laboratory Experiments. Green Chemistry Task Force Committee, DST,

Cluster Elective –PAPER – VIII-A-3

ST.JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS), VISAKHAPATNAM

VI SEMESTER **CHEMISTRY** **3 Hrs/ Week**

CH A36203 (3) **POLYMER CHEMISTRY** **Max. Marks: 60**

w.e.f 2017-2018 ('15AC' Batch) **SYLLABUS**

OBJECTIVES: To enable the students to –

1. To introduce upcoming fields like polymers, which have lot of promise is believed to be the major research field of future.
2. Know and identify the characterization, classification of polymers and various manufacturing units for plastics, elastomeric materials and fibers with special emphasis on synthetic approach to many polymers.

UNIT-I

1. **Introduction of polymers:** Basic definitions, degree of polymerization ,classification of polymers- Natural, Synthetic polymers and Semisynthetic polymers, Organic and Inorganic polymers, Thermoplastic and Thermosetting polymers, Plastics, Elastomers , Fibers and Resins, Linear ,Branched and Cross Linked polymers,
2. **Mechanism of polymerization**: Addition polymers and Condensation Polymers, Free radical, ionic and Zeigler – Natta polymerization.

UNIT-II

3. Kinetics of Free radical polymerization, Glass Transition temperature (Tg) and Determination of Tg: factors affecting glass transition temperature (Tg).
4. **Techniques of Polymerization:** Bulk polymerization, solution polymerization, suspension and Emulsion polymerization. Molecular weights of polymers: Number average and weight average molecular weights Determination of molecular weight of polymers by Viscometry, Osmometry and light scattering methods.

UNIT-III

5. **Polymer additives**: Introduction to plastic additives – fillers, Plasticizers and Softeners, Lubricants and Flow Promoters, Anti aging additives, Flame Retardants , Colourants , Blowing agents , Cross linking agents, Photo stabilizers , Nucleating agents.
6. **Polymers and their applications**: Preparation and industrial applications of Polyethylene, Polyvinyl chloride, Teflon, Polyacrylonitrile, Terelene, Nylon6.6 silicones. Biodegradable Polymers - Examples-importance of biodegradable Polymers.

Reference Books:

1. Seymour, R.B. & Carraher, C.E. Polymer Chemistry: An Introduction, Marcel Dekker, Inc. New York, 1981.
2. Odian, G. Principles of Polymerization, 4th Ed. Wiley, 2004.
3. Billmeyer, F.W. Textbook of Polymer Science, 2nd Ed. Wiley Interscience, 1971.
4. Ghosh, P. Polymer Science & Technology, Tata McGraw-Hill Education, 1991.34
5. Lenz, R.W. Organic Chemistry of Synthetic High Polymers. Interscience Publishers, NewYork, 1967.

ST. JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS) VISAKHAPATNAM

VI SEMESTER **CHEMISTRY** **TIME: 3Hrs/week**

CH A36253(1) **WATER ANALYSIS** **Max. Marks: 50**

w. e .f 2017-2018'AC' batch PRACTICAL SYLLABUS

OBJECTIVE: To enable the students to examine water quality through quantitative estimation of selected water quality parameters

1. Determination of carbonate and bicarbonate in water samples (acidity and alkalinity)
2. Determination of hardness of water using EDTA
   a) Permanent hardness
   b) Temporary hardness
3. Determination of Acidity
4. Determination of Alkalinity
5. Determination of chlorides in water samples

REFRENCES :

1. Vogel's T.B. of Quantitative Inorganic Analysis – J. Besseth R.C.Denney, GH Jeffery & J.Mendham. ELBS – IV Edition.
2. Standard Methods for the Examination of Water and Waste Water, 19th Edition, APHA, AWWA, WEF 1995.