

**ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION**

(A Statutory body of the Government of Andhra Pradesh)

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## REVISED SYLLABUS OF B.Sc (Chemistry)

**UNDER CBCS FRAMEWORK WITH EFFECT FROM 2020-2021**

**PROGRAMME: THREE-YEAR B.Sc. (B.Sc Chemistry)**

**Chemistry**

***(With Learning Outcomes, Unit-wise Syllabus, References, Co-curricular Activities & Model Q.P.)***

***For Fifteen Courses of 1, 2, 3 & 4 Semesters)***

**(To be Implemented from 2020-21 Academic Year) Andhra Pradesh State Council of Higher Education**

# B.Sc. Chemistry Revised Syllabus under CBCS

**w.e.f. 2020-21**

# Structure of Chemistry Core Syllabus under CBCS

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| **YEAR** | **SEMESTER** | **COURSE** | **TITLE** | **MARKS** | **CREDITS** |
| **I** | I | I | Inorganic and Physical Chemistry | 100 | 03 |
| Practical – I Analysis of SALT MIXTURE | 50 | 02 |
| II | II | Organic and General Chemistry | 100 | 03 |
| Practical – II Volumetric Analysis | 50 | 02 |
| **II** | III | III | Organic Chemistry and Spectroscopy | 100 | 03 |
| Practical – III Organic preparations and IR Spectral Analysis | 50 | 02 |
| IV | IV | Inorganic, Organic and Physical Chemistry | 100 | 03 |
| Practical – IV Organic Qualitative analysis | 50 | 02 |
|  |  | V | GREEN CHEMISTRY | 100 | 02 |
| Practical-V  GREEN CHEMISTRY | 50 | 02 |

SEMESTER-V PAPER VII

GREEN CHEMISTRY

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).

UNIT-II 10h

Selection of solvent:i) Aqueous phase reactions ii) Reactions in ionic liquids,

Heckreaction, Suzuki reactions, epoxidation. iii) Solid supported synthesis

Super critical CO2: Preparation, properties and applications, (decaffeination, dry

cleaning)

UNIT-III 10h

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

UNIT-IV 5h

Green catalysis: Heterogeneous catalysis, use of zeolites, silica, alumina, supported

catalysis- biocatalysis: Enzymes, microbes Phase transfer catalysis (micellar/surfactant)

UNIT V 10h

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 – 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. Principles and practice of heterogeneous catalysis, Thomas J.M.,Thomas M.J., John

Wiley

7. Green Chemistry: Environmental friendly alternatives R S Sanghli and M.M

Srivastava, Narosa Publications

LABORATORY COURSE – VII

Practical Paper – Elective VII C (at the end of semester VI) 30 hrs (2 h/W)

1. Determination of specific reaction rate of hydrolysis for methyl acetate catalysed

by hydrogen ion at room temperature.

2.Determination of molecular status and partition coefficient of benzoicacidin Benzene

and water.

3. Surface tension and viscosity of liquids.

4. Adsorption of acetic acid on animal charcoal, verification of Freundlisch isotherm