

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

**VISAKHAPATNAM**

**VIII SEMESTER B.Sc. HONOURS CHEMISTRY Time: 4hrs/week**

**Code CH 8206(3) Revised Syllabus Under CBCS 2020-21 Marks: 100**

**Corrosion and Its Prevention**

**Course Objective:** To enable students to understand implications of corrosion and realize the significance and utility of various protective coatings

**Course Outcomes:** At the end of the course the student will be able to-

- create awareness on corrosion and its control process
- identify protective metallic coatings for prevention of corrosion
- focuses on protective coatings of materials.
- It covers about the insulating materials in electric industries and also become aware about Semiconductors.

**II. Syllabus:**

**Unit-I: Corrosion**

**12 hours**

Introduction - Economic aspects of corrosion - Dry or Chemical Corrosion - Wet or electrochemical corrosion - Mechanism of Electrochemical Corrosion. Galvanic Corrosion - Concentration Cell Corrosion - Differential aeration corrosion - Pitting Corrosion - Underground or soil corrosion – Passivity.

**Unit-II: Corrosion and Its Control**

**12 hours**

Factors Influencing Corrosion - Microbiological Corrosion Atmospheric corrosion – Corrosion Control - Proper designing - Using pure metal - Using metal alloys. Chemical conversion – Coating - Phosphating–Chromising - Treatment of metal surfaceshot dipping - Use of inhibitors.

**Unit-III: Protective Coatings**

**12 hours**

PROTECTIVE COATINGS-Introduction - Metallic Coatings - Various methods of cleaning articles before electrode position – Electroplate and - Electroplating methods. Pre-treatment of the surface– Metallic Coatings - Hot Dipping -Cementation or Impregnated Coatings - Sprayed Metal Coatings - Cladding – Vapour Deposition.

**Unit-IV Paints****12 hours**

Paints - ingredients and their functions Required Properties of a Paint-Paint Constituents and Their Functions - Manufacture of Paint. Types of Pigments- Characteristics of pigment - Oils - Uses in Paint Emulsion Paints – Special Paints - Paint Remover Varnishes.

**Unit-V: Insulators and Semiconductors****12 hours**

Electrical Insulating Materials - Dielectric properties - Requirements of an Electrical Insulating Material - Classification of insulating material - Electrical Rigid Insulations. Semiconductors - Introduction - Classification – Degenerate semiconductors – Super conductors.

**III. Suggested Co-Curricular Activities**

1. Training of students by related industrial experts.
2. Assignments, Seminars and Quiz (on related topics), collection of relevant videos and material.
3. Visits of related Industries/firms, research organizations etc.
4. Invited lectures and presentations on related topics by field/industrial experts.

**IV. List of References Books:**

1. M.G. Fontana: Corrosion Engineering, McGraw Hill International Book Co. London.
2. L.L. Shreir: Corrosion, Vol I and Vol II, Newness Butterworths, Edward Arnold Ltd, London.
3. Ltd, London.
4. J.C. Scully: Fundamental of Corrosion, Pergamon Press Inc. New York, USA.
5. M.G. Fontana: Corrosion Engineering, McGraw Hill International Book Co. London.
6. London.
7. L.L. Shreir: Corrosion, Vol. I and Vol. II, Newness Butter worths, Edward Arnold Ltd, London.
8. Ltd, London.

9. J.C. Scully: Fundamental of Corrosion, Pergamon Press Inc. New York, USA.
10. V.S. Sastry: Corrosion Inhibitors, Principles & Applications, John Wiley & Sons.
11. C.C. Nathan: Corrosion Inhibitors, NACE, Houston, Texas.
12. Corrosion - Causes and Prevention: Speller. F. N.
13. Material Science mini refresher by H.S. Bawa, Tata publisher India.