Course Type	Course Code	Name of Course		Т	Р	Credit
DE	NCYD527	Science of Corrosion & Corrosion Control	3	0	0	3

**Course Objective** 

- Most of the industries such as chemical, mining and petroleum industries are facing the corrosion problems. In a recent survey made in India it was estimated that the annual loss due to corrosion is approximately 3 4% loss of the GDP. We teach corrosion to paper to B. Tech students of Petroleum Engineering, Mechanical Engineering and Chemical Engineering students. Therefore we have floated this course as open elective.
- The course is offered to impart: Knowledge about the problem faced by industries
- Develop understanding about the mechanism and process of corrosion
- Knowledge about various methods for protection against corrosion

## **Learning Outcomes**

• Knowledge of corrosion and corrosion control to engineering students will help in their working in industries.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Definition of corrosion, consequences of corrosion and economic aspects of corrosion. Types of corrosion: Chemical and electrochemical corrosion, Pilling Bedworth rule, Forms of corrosion, Theories of corrosion. Factors affecting corrosion. Kinetics of corrosion: Evan's diagram. Thermodynamics of corrosion- Pourbaix diagram.	14L	Students will learn about the fundamentals of corrosion, economics loss due to corrosion and mechanism of corrosion process.
2	Measurement of corrosion: Weight loss, potentiodynamic polarization and electrochemical impedance spectroscopy methods. Corrosion prevention: modification of materials, modification of environment, modification in design, corrosion inhibitors, protective coatings, cathodic and anodic protection.	16L	The learning outcome of this part will be to understand different methods used to measure the effect of corrosion and methods used for the protection of corrosion.
3	Application of FTIR, SEM-EDX, XPS and AFM in corrosion inhibition studies. Corrosion problems in Chemical, Mining and petroleum industries.	12L	The students will learn about the different techniques used to study the corrosion process and the problems faced by different industries due to corrosion and their solution.
	TOTAL	42	

## **Text Books:**

1. Corrosion Engineering, Mars. G. Fontana, 3rd Edition, McGraw-Hill, Inc. 1987.

## **Reference Books:**

- 1. Principles and prevention of corrosion, Denny A. Jones, 2<sup>nd</sup> Edition, Prentice Hall, 1995.
- 2. An Introduction to Science of Corrosion and Its Inhibition, S. N. Banerjee, Oxonian Press, 1985.