PMT5D001 MATERIAL FAILURE & ANALYSIS (HONOURS)

Module-I (14 Hours)

Aims of failure analysis, Methodology of Failure Analysis, Tree analysis.Prime factors in the premature failure of metallic components and structures, Tools and techniques in failure analysis, Sources of Failures, Steps in Failure Analysis, preservation and preparation of samples for failure analysis.

Module-II (12 Hours)

Types of failures: ductile, brittle, fatigue, creep, corrosion, wear etc., fractography, mixed mode and fatigue failures, Failure mechanisms, Embrittlement phenomena, environmental effects, Failures due to faulty heat treatments, Failures in metal forming and weldments.

Module-III (12 Hours)

Case studies in failure analysis: Case histories of component failures. Typical case studies of failure of important components such as gears, shafts, pressure vessels etc. Prevention of failures.

Books for reference:

1. *Failure Analysis & Prevention (Vol. - X), Metal Hand Book, ASM Publication.*
2. *Colangelo V. J. and Heiser F. A., Analysis of Metallurgical Failures, (Wiley).*
3. *Mobley R.K., Root cause failure analysis.*
4. *Dieter G.E., Mechanical Metallurgy, McGraw-Hill Company.*
5. *Courtney T.H., Mechanical Behaviour of Materials.*
6. *Rolfe S.T. and Barsom J.M., Fracture and Fatigue Control in Structures, Prentice.*