

PME4D002 SURFACE ENGINEERING (HONORS ELECTIVE)

MODULE – I (14 HOURS)

Mechanisms of Wear and Metal Cleaning: Basic Mechanisms of wear-abrasive, adhesive wear, contact fatigue, Fretting corrosion, Testing of wear resistance, practical diagnosis of wear, general cleaning process for ferrous and non ferrous metals and alloys selection of cleaning processes, alkaline cleaning, emulsion cleaning, ultrasonic cleaning, pickling salt bath descaling, abrasive bath cleaning, polishing and buffing shot peening.

MODULE – II (16 HOURS)

Thermal Spraying Processes and Electrodeposited Coatings: Thermal spraying materials, characteristics of thermal spray processes, Design for thermally sprayed coatings coating production, spray fused coatings, Principles of electroplating, Technology and control-electroplating systems, Properties and applications of electrodeposits, Non aqueous and electroless deposition, plasma coating.

Hot Dip Coating and Diffusion Coating: Principles, Surface preparation, Batchcoating and continuous coating process, Coating properties and application, Principles of cementation, Cladding-vacuum deposition, Sprayed metal coating, Structure of diffusion coatings, Chemical vapour deposition (CVD), Physical vapour deposition (PVD).

MODULE – III (14 HOURS)

Non-Metallic Coating Oxide and Conversion Coatings: Plating coating, lacquers, rubbers and elastomers, vitreous enamels, anodizing Chromating, application to aluminium, magnesium, tin, zinc, cadmium copper and silver, phosphating primers.

Quality Assurance, Testing and Selection of Coatings: The quality plan, design, testing and inspection, thickness and porosity measurement, selection of coatings, industrial applications of engineering coatings.

TEXT BOOKS :

1. Engineering Coatings-design and application- S. Grainger, Jaico Publishing House.
2. Principles of Metals surface treatment and protection- D. R. Gabe, Pergamon.

REFERENCE BOOKS:

1. Electroplating Handbooks- N.V.Parathasarathy, Prentice Hall.
2. Advances in surface treatment- Niku-Lavi, Pergamon.