

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: VII

METALLURGY ENGINEERING

Subject Name: **Surface Coating Technology (Department Elective-I)**

Subject Code: **172107**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam (E)		Mid Sem Exam (Theory) (M)	Practical (Internal)
				Theory	Practical		
3	1	0	4	70	30	30	20

Sr. No	Course Content	Total Hrs.
1.	Introduction to surface engineering, Scope of surface engineering in metals, ceramics, polymers and composites, Surface Preparation methods such as Chemical, Electrochemical, Mechanical- Sand Blasting, Shot peening, Shot blasting, Hydroblasting, Vapor Phase Degreasing etc., Properties of Various Coating, Coating Methods.	8
2.	Chemical Conversion Coating: Chromating, Phosphating, Anodizing, Thermochemical processes, industrial practice, economy and energy considerations.	10
3.	Metallic coating: Surface pretreatments, Hot Dipping, galvanizing, Electrolytic and Electroless plating of important metals and alloys, testing/evaluation of surface properties.	8
4.	Coating from Vapour Phase: PVD, CVD, Various Methods used, mechanisms, important reactions involved and applications.	8
5.	Plasma Coating: Sputtering, Plasma Spray & Ion Implantation Methods, mechanisms & applications. Surface modification by directed energy beams like ion, electron and laser beams, novelty of composition and microstructures.	10
6.	Diffusion Coating: Various Techniques For Single And Multiple Element Coating, High Temperature Coating- Carburising, Carbonitriding,	8

	Silicanizing,Chromizing,, Aluminizing, Boronizing, Boronitriding.	
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Text Books:

1. J. R. Davis-Surface Engineering for Corrosion and Wear Resistance.
2. George J. Rudzki -Surface Finishing Systems. metal annd non-metal finishing handbook-guide,Metals Park : ASM, 1983
3. James A. Murphy- Surface Preparation and Finishes for Metal, McGraw-Hill, New York 1971

References Books:

1. P. G. Sheasby and R. Pinner - Surface treatment and finishing of Aluminium and its alloy,Volume-2, 5th ed., ASM, Metals Park, 1987
2. K. E. Thelning -Steel and its Heat Treatment Bofors Handbook, London : Butterworths, 1975
3. Surface Engineering Hand Book, edited by Keith Austin, London : Kogan Page, 1998