



Semnan University
Faculty of Materials and Metallurgical Engineering

In the name of God

Course Outline

2nd semester 2018/2019

updated on 01/23/2019

Course: Surface Engineering & Coatings		No. of units: 3	Level: Undergraduate
Lecturer: Dr. Habibollahzadeh		Pre-request: Heat treatment of Metals	
Internal Phone No: 3383			
Email: ahabibolahzadeh@semnan.ac.ir		Website: http://ahabibolahzadeh.profile.semnan.ac.ir	
Hours per week: 3		Class No:	
Scope: Introduction to surface, its properties, measurement methods, typical coating methods			
Assessment	Class activities	Quiz	Final exam
Percent	5% + unlimited extra credit for additional activities	15%	80%
References:			
Introduction to Surface Engineering and Functionally Engineered Materials, P. Martin			
Surface Engineering for Corrosion and Wear Resistance. Ed. Davis			

Schedule

Educational week	Topics	Notes
1	Introduction: Surface definition, surface and its importance, effect of surface processing on surface characteristics, Study of physical and mechanical properties of the surface; surface geometry and roughness	
2	Study of physical and mechanical properties of the surface; microhardness and nano-indentation	
3	Study of physical and mechanical properties of the surface; residual stresses and its measurement methods	
4	Study of physical and mechanical properties of the surface; wettability, adhesion, interface, fatigue	
5	Study of physical and mechanical properties of the surface; surface tribology- friction	
6	Study of physical and mechanical properties of the surface; surface tribology- wear, lubrication, and erosion	
7	Methods of surface cleaning	
8	Coating; desired properties of coatings, parameters in selection of coating method, cladding	
9	Coating; laser and its applications, welding and its applications	
10	Coating; thermal spray, plasma spray	
11	Coating; plasma spray, thermal barrier coating	
12	Coating; hot dipping, sol-gel process	
13	Coating; electroplating	
14	Coating; electroless plating, composite coatings	
15	Coating; physical vapor deposition	
16	Coating; chemical vapor deposition, ion implantation	