Information sheet for the course
Surface Engineering

University: *Alexander Dubček University of Trenčín*	
Faculty: *Faculty of Industrial Technologies in Púchov*	
Course unit code: *MI-I-PV-13A*	**Course unit title:** *Surface Engineering*
Type of course unit: *optional*	
Planned types, learning activities and teaching methods: *Lecture: 2 hours weekly/26 hours per semester of study; face to face* *Seminar: 1 hour weekly/13 hours per semester of study; face to face* *Laboratory tutorial: 0*	
Number of credits: *3*	
Recommended semester: *3rd semester in the 2nd year full-time* *5th semester in the 3rd year full-time*	
Degree of study: *the 2nd degree of study (Engineer's degree)*	
Course prerequisites: *none*	
Assessment methods: *Tests and individual report on the proposal of the surface treatment of a given material*	
Learning outcomes of the course unit: *Students will acquire personal approach to proposing surface treatment and how to improve fracture properties of materials by surface treatment. They will be able to select coatings based on the character of the substrate and evaluate the quality achieved by surface treatment.*	
Course contents: 1. *Thermal and material properties of metallic and nonmetallic materials in the role of substrates* 2. *Performance of surfaces of various types of materials from the aspect of physics* 3. *Up-to-date methods of heat treatment of metals – induction heating, laser* 4. *Combined chemical and heat treatment of the surface of high-strength steels* 5. *Mechanical hardening of the metal surface by plastic deformation* 6. *Surface wear by abrasion, erosion, cavitation and vibration* 7. *Change of surface quality after degradation and surface treatment* 8. *Assessment of changes of surfaces after loading in operation* 9. *Preparation of coatings and coating procedures* 10. *PVD* 11. *CVD* 12. *Degradation processes and limit states on the surfaces of materials* 13. *Tribological tests of surfaces.* *Curriculum of seminar:* 1. *Characteristics of material surfaces* 2. *Identification of surface failures* 3. *Examination and protection of surfaces of technical materials* 4. *Measurement of unevenness of surfaces* 5. *Assessment of surface oxide layers* 6. *Surface quality in context with loading* *Microscopic analysis of changes of surfaces*	

Recommended references and resources:

1. Fiala , J. – Mentl, V. – Šutt, O.: Struktura a vlastnosti materiálu. Praha: Academia, 2003.

Language: *Slovak*

Remarks: *none*

Evaluation history: *Celkový počet hodnotených študentov: 30*

A	B	C	D	E	FX
13.33	53.33	26.67	3.33	3.33	0.0

Lecturers: *prof. Ing. Františka Pešlová, PhD.*

Last modification: *31.03.2014*

Supervisor: *prof. Ing. Darina Ondrušová, PhD.*