



COURSE DATASHEET

Semester:	2013/14/1
Course:	Special Processings I.
Code:	VEMKFK4212M
Responsible department:	Department of Physical Chemistry
Department code:	MKFK
Responsible instructor:	dr. András Dallos

Course objectives:

Teaching the nontraditional machining and advanced manufacturing processes using in micromechanics, surface manufacturing and layer deposition technologies via lectures and examples

Course content:

1. Basics of solid state and surface physics 2. Surface machining by mechanical methods. Ultrasonic, ultrasonic rotary and ultrasonic abrasive machining. 3. Powder particle machining. Abrasive flow and jet machining. Microabrasive machining. 4. Water jet and abrasive water jet machining. 5. Surface machining by non-traditional high energy methods. Electron beam machining. 6. Plasma beam (arc) machining. 7. Laser beam machining. 8. Electric discharge and wire electric discharge machining. 9. Electrochemical machining, polishing and drilling. 10. Chemical and photochemical machining, milling, etching. 11. The physico-chemical basics of surface technologies and layer depositions. 12. Physical vapor deposition 13. Chemical vapor deposition 14. Electrochemical coatings. 15. Measurement methods for properties of thin films and layers

Requirements, evaluation and grading:

After receiving the exam-question, the student has 30 minutes time for the preparation of the answer and afterwards 20-25 minutes time for its presentation. The answer is insufficient (fail mark 1), if the student is not able to give a short overview on the subject in question and does not know the definitions of the basics of the topic. The answer is sufficient (pass mark 2), if the student can interpret the basics of the topic. The answer is medium (pass mark 3), if the student knows the basics of the topic and the student can explain the logical connections of the topic with a help of the examining teacher. The answer is good (pass mark 4), if the student can explain all of the important parts and their connections of the topic in a logically exact answer, without any help, but the student does not know the selected bibliography of the topic. The answer is excellent (pass mark 5), if the student can explain all of the parts and their connections of the topic with the extensions of the selected bibliography in a logically exact answer, without any help.

Required and recommended readings:

1. KA. Jackson, W. Schröter (Ed): Handbook of Semiconductor Technology, 2000. 2. H.G. Rubahnmpfi, H.Rubahn: Laser Applications in Surface Science and Technology 1999. 3. J. Brown: Advanced Machining Technology Handbook, McGraw-Hill Professional; 1998. 4. HO. Pierson: Handbook of Chemical Vapor Deposition, Second Edition, 1998. 5. K. Seshan: Handbook of Thin Film Deposition Processes and Techniques, 2001. 6. DM. Mattox: Handbook of Physical Vapor Deposition (PVD) Processing, 1998