



COURSE DATASHEET

Semester:	2013/14/1
Course:	Corrosion basics
Code:	VEMKFKT217A
Responsible department:	Department of Physical Chemistry
Department code:	MKFK
Responsible instructor:	dr. Tamás Kristóf

Course objectives:

General overview of corrosion. The influence of various factors on the initiation and advancement of corrosion.

Course content:

Design and failure analysis. Economic considerations.
Oxygen concentration cells. Galvanic action. Mechanical aspects. Stress Corrosion. Erosion corrosion, cavitation and impingement. Environmental cracking.
High-temperature corrosion, including air, flue gases and steam. Scaling. Special kinds of corrosion. Corrosion charts.
Underground corrosion. Protection of pipelines and tanks. Corrosion of reinforced concrete. Control of microbial activity.
Methods of corrosion control. Design features. Corrosion protection by corrosion products. Passivation, anodizing, phosphating, chromating.
Corrosion protection by coating. Metallic coating. Hot-dip coating and hot-dip galvanizing. Plating. Inorganic coating. Conversion coating. Enameling. Organic coating. Paint-coats. Temporary protection.
Inhibitors. Theoretical background. Mechanism of inhibition. Anodic, cathodic and filming inhibitors. Practical applications.
Methods of active corrosion control. Cathodic and anodic protection.

Requirements, evaluation and grading:

After a half an hour's preparation the examinee gives an oral presentation on the topic for about 20-25 minutes.

Fail (1) when the examinee is unable to prove either the definition of the basic notions or the short scheme of things connected with the topic.

Pass (2) when the examinee is able to interpret the basic notions of the topic.

Satisfactory (3) when the examinee is well - versed in the basic notions of the topic and is able to present their logic connections - with the help of the examiner.

Good (4) when the examinee provides a logic, well - structured presentation with all the important facts and connections but he does not know or partly knows the required reading material connected with the topic.



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Requirements, evaluation and grading:

Very good (5) when the examinee gives a logic, excellent, well-structured, perfect in details oral presentation that completely reveals the connection of the concepts within the topic.

Required and recommended readings:

Salamon T. Korróziós alapismeretek. Veszprémi Egyetemi Kiadó, 2002
Kiss L.: Az elektrokémiai fémoldódás kinetikája Akadémiai Budapest 1980
Dévay J.: Fémek korróziója és korrózióvédelme Műszaki Budapest 1979
Bockris J. O'M., Reddy A. K. N.: Modern Electrochemistry Vol.2 3. Ed. Plenum New York 1973
Gellings P.J.: Introduction to Corrosion Prevention and Control for Engineers Delft University Delft 1976
Comprehensive Treatise of Electrochemistry Vol.4 Electrochemical Materials Science Ed. Bockris J. O'M., Conway B. E., Yeager E. White R.E. Plenum New York 1981
Corrosion Basics NACE Huston 1984
Comprehensive Chemical Kinetics Vol.28 Reactions at the Liquid-Solid Interface Ed. Compton R. G. Elsevier Amsterdam 1989
Bockris J. O'M., Khan U. N.: Surface Electrochemistry Plenum New York 1993
R. Donndorf: Szerkezeti anyagok és korrózió elleni védelem a vegyiparban. Műszaki Könyvkiadó, Bp. 1982.