# UNIVERSITY OF PANNONIA

## COURSE DATASHEET

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|---|---|
| **Semester:** | 2013/14/1 |
| **Course:** | Corrosion Damage Processes in Structural Materials |
| **Code:** | VEMKFKT114K |
| **Responsible department:** | Department of Physical Chemistry |
| **Department code:** | MKFK |
| **Responsible instructor:** | dr. Mónika Valiskó |

**Course objectives:**

Properties of steel classes and non-ironic metals from corrosion point of view

**Course content:**

Corrosion Damage Processes in Structural Materials

Corrosion resistant structural materials: steels, non-ferritic materials (cupper, aluminium)
Refining industry damage mechanisms:
A. Uniform or Localized Loss in Thickness Phenomena
- Amine Corrosion
- Ammonium Bisulfide Corrosion (Alkaline Sour Water)
- Ammonium Chloride Corrosion
- Hydrochloric Acid (HCl) Corrosion
- High Temp H2/H2S Corrosion
- Hydrofluoric (HF) Acid Corrosion
- Naphthenic Acid Corrosion (NAC)
- Phenol (Carbonic Acid) Corrosion
- Phosphoric Acid Corrosion
- Sour Water Corrosion (Acidic)
- Sulfuric Acid Corrosion

B. Environment–Assisted Cracking
- Polythionic Acid Stress Corrosion Cracking (PASCC)
- Amine Stress Corrosion Cracking
- Wet H2S Damage (Blistering / HIC / SOHIC / SCC)
- Hydrogen Stress Cracking – HF
- Carbonate Stress Corrosion Cracking

C. Other Mechanisms
- High Temperature Hydrogen Attack (HTHA)
- Titanium Hydriding

Detection of corrosion damages with non-destructive testing methods
Effect of corrosion damage on the load-carrying capability of structural materials, up-to-date

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**Course content:**

structural integrity assessment methods
Corrosion failure cases

**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.
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:**

R. Donndorf: Szerkezeti anyagok és korrózió elleni védelem a vegyiparban. Műszaki Könyvkiadó, Budapest, 1982.
Dévay J.: Fémek korróziója és korrózióvédelme Műszaki Budapest 1979
W.H. Ailor: Handbook on corrosion testing and evalucation, Wiley, New York, 1971.
Corrosion Monitoring Handbook Hobles, London, 1984