

Course title: Degradation of materials – selectable / ~~regular course~~

Number of contact hours: 45 hours (35h lectures/10 Lab)

ETCS credits: 3

Course description: The objective of the lecture is to identify and to understand damage mechanisms of structural materials (especially those employed in the chemical industry) that result from mechanical solicitations and from environmental effect. From this knowledge, the students will be able to run industrial plants with safety conditions or will be able to conduct fracture and corrosion analysis. Influence of different parameters on the different kinds of fracture will be studied.

Education effects (P7S_UW, P7S_WG):

Students know the main families of materials employed for components in chemical engineering

Students know the main causes of failure of components in chemical engineering

Students know the main tools for material characterization

Students are able to characterize a structural material

Students are able to take part in fracture analysis

Students are able to run equipment in safe conditions

Literature:

1. Mechanical behaviour of materials, Thomas H. Courtney, Mac graw Hill publishing Company (1990)

2. Stress corrosion cracking: materials performance and evaluation, Russel H. Jones, ASM International (1992)

3. Fatigue of materials, S. Suresh, Cambridge University press (1991)

Assessment method: exam

Prerequisites: Metallurgy; Basic knowledge in physics, chemistry and electrochemistry; Basics knowledge in mechanics.

Primary target group:

Lecturer: Jean-Bernard VOGT - Ecole Nationale Supérieure de Chimie de Lille