

Course name	Laboratory “Corrosion and Corrosion Protection”			
In semester number	CIB 6, CIB 7			
ECTS- Credits (30 hours)	6			
Workload / hours	Total 180	Contact time 90	Self-study 60	Preparation for examination 30
Prerequisites	Basic knowledge of corrosion and coatings technology			
Total target	<ul style="list-style-type: none"> <li>- Knowledge of methods to evaluate the corrosion behaviour of metals</li> <li>- Knowledge of methods to evaluate the effectiveness of corrosion protective measures</li> <li>- Ability to apply these methods to practical problems</li> </ul>			
Content	<p><b>Experiments</b></p> <ul style="list-style-type: none"> <li>- Electrode potentials</li> <li>- I-E-curves of Fe, Fe-Cr and Fe-Cr-Ni alloys with varying Cr-concentrations in sulfuric acid, passivity</li> <li>- Atmospheric corrosion of Fe with NaCl-droplet deposition</li> <li>- Pitting corrosion of Fe-Cr-Ni alloys – effect of potential sweep rate, steel composition, and chloride concentration</li> <li>- Measurement of corrosion rates with different methods Tafel method <ul style="list-style-type: none"> <li>- Polarisation resistance method</li> <li>- Volumetric method</li> <li>- Gravimetric method</li> </ul> </li> <li>- Effectivity and inhibiting mechanism of corrosion inhibitors</li> <li>- Anodic and cathodic blistering of organic coatings on steel</li> <li>- Phosphating and effect of errors in the phosphating process</li> <li>- Osmotic blistering of organic coatings</li> <li>- Cathodic delamination</li> <li>- Filiform corrosion</li> <li>- Phosphatizing</li> <li>- Determination of resistances and capacitances of electronic circuits using impedance spectroscopy</li> <li>- Water uptake of organic coatings</li> <li>- Comparison of corrosion resistance of coatings, e.g. yoghurt lids of aluminum cans</li> <li>- Non-destructive evaluation of steel bars in concrete</li> <li>- Analysis of corrosion failures</li> </ul>			
Reference material	Current publications and patents D.A.Jones, Principles and Prevention of Corrosion, Macmillan Publishing Company, 1992 Egon Kunze, Korrosion und Korrosionsschutz, Band 1 bis 6, Wiley-VCH, 2001			
Module owner	R. Lobnig			
Language	English			

### Description

Type of instruction/ type of learning	Hours/week	Targets, learning outcomes	Type of assessment	Estimated student workload in hours
Laboratory “Corrosion and Corrosion Protection”	6	<p><b>Knowledge of and classical testing methods</b></p> <ul style="list-style-type: none"> <li>- Measurement of electrode potentials</li> <li>- Potentiostatic and galvanostatic</li> </ul>	Short presentation of experimental results, Lab work, Lab journal, Written examination	200

		<p>measurements</p> <ul style="list-style-type: none"><li>- Electrochemical noise</li><li>- Impedance spectroscopy</li><li>- Scanning Kelvin probe</li><li>- Salt spray testing</li><li>- Tests with temperature-relative humidity-cycling</li><li>- Metallography</li><li>- Electron microscopy</li></ul> <p><b><i>Ability to apply these techniques to practical problems</i></b></p>		
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