

**Curriculum - Academic Year 2018-19**  
**Characteristics of the Course Units**

Name	<i>Electrochemical Methods and corrosion</i>
ECTS credits	4
Year / Semester	I/2
Specific learning outcomes	<p><i>On successful completion of this module students should be able to:</i></p> <p><i>1 – Demonstrate knowledge and understanding of the fundamentals of the Electrochemical Methods discipline and appreciate their applications.</i></p> <p><i>2 – Recognize the basis of the different methods (eg; potentiometry, amperometry, and voltammetry)</i></p> <p><i>3 – Interpret the potential intensity curves.</i></p> <p><i>4 – Estimate the limit current, the coefficient of diffusion, and thickness of the limit layer.</i></p> <p><i>5 – Draw and interpret the Pourbaix diagrams</i></p> <p><i>6 – Understand the mechanism of electrochemical corrosion of metals</i></p> <p><i>7 – Apply corrosion protection techniques in order to limit corrosion of metals.</i></p>
Contents	<p><i>Introduction to electrochemical methods; Potentiometry with no current; Potentiometry with imposed current; Amperometry with imposed potential; Amperometry with imposed ddp; Voltammetry with linear sweep; Voltammetry with cyclic sweep; Different types of corrosion; Electrochemical Thermodynamic of the corrosion; Electrochemical kinetic of the corrosion; Corrosion prevention and protection</i></p>
Teaching and learning methods	
Teaching techniques	<p><i>Lectures, hours</i></p> <p><i>Practical classes, hours</i></p>
Assessment methods	<p><i>Written.</i></p> <p><i>A two mid-term written test and a final-term written test are foreseen.</i></p> <p><i>The first mid-term written test will be devoted to the assessment of the level of achievement of LOs 1, 2, 3 and 4.</i></p> <p><i>The second mid-term written test will be devoted to the assessment of the level of achievement of LOs 5, 6 and 7.</i></p> <p><i>The final term written test will be devoted to the assessment of the level of achievement of LOs 3,4, 5, 6 and 7.</i></p>
Assessment criteria	<p><i>In the mid-term test students should demonstrate their ability to describe each of the electrochemical methods, interpret the potential intensity curves, and perform quantitative calculations for each of the methods if provided appropriate information or data.</i></p> <p><i>In the second mid-term students should demonstrate their ability to draw and interpret the Pourbaix diagram, understand the mechanism of electrochemical corrosion of metal, and apply corrosion protection techniques in order to limit corrosion of metals.</i></p>
Assessment metrics	<i>Attribution of a final grade</i>
Criteria of attribution of the final grade	<p><i>The grade goes from 1 (minimum) up to 20 (maximum). The minimum threshold to pass is 7. To pass the exam students should obtain the minimum evaluation in all the assessments.</i></p> <p><i>The final grade will be determined according to the following rules:</i></p> <ul style="list-style-type: none"> <li><i>- Mid-terms written test: 20%</i></li> </ul>

	<ul style="list-style-type: none"><li>- <i>Practical classes assessments: 30%</i></li><li>- <i>Final examination (including): 50%</i></li></ul>
Preparatory course units	<i>N.A.</i>
Didactic material	<i>Douglas A. Skoog "Principles of Instrumental Analysis"</i> <i>J. Bard "Electrochemical methods. Fundamentals and applications"</i> <i>D. Landolt "Corrosion and surface chemistry of metals"</i>