

ELECTROCHEMISTRY

1.1. Identification

University:	Universidad Politécnica de Valencia												
School:	Escuela Técnica Superior de Ingeniería del Diseño												
Course:	Electrochemistry												
ECTS:	4												
Semester:	<i>Winter</i>				X	<i>Summer</i>							
Category	<i>Fundamental course</i>					X	<i>Specialisation course</i>						
Module	<i>MFI</i>		<i>MFII</i>		<i>MFIII</i>	X	<i>MSI</i>		<i>MSII</i>		<i>MSIII</i>		
Teachers:	Juan Soto , Angel Benito												
Language:	<i>English</i>	X	<i>Italian</i>		<i>Swedish</i>		<i>Spanish</i>				X		

1.2. Learning-outcomes

- knowledge about sophisticated and intelligent control systems
- knowledge about the physical, chemical and technological fundamentals of electrochemical processes

1.3. Competencies

▪ General

- to design and use any type of sensor system
- to have critical understanding of technical and scientific tools
- to work and manage teams
- communication skills (both written and oral)
- to work in an international context
- knowledge of different European languages

▪ Specific

- to understand the basis of electrochemical processes
- to be able to apply electrochemical techniques for evaluation of corrosion
- to understand technological application based on electrochemical technology

1.4. Contents

1. Electrochemical potentials 2. Uses of standard potentials. Reference and indicator electrodes. 3. Batteries and fuel cells. 4. Electrolytic conductance. Conductivity. Conductance applications. 5. Voltammetry of reversible systems. Diffusion. Experimental techniques. Electroanalytical methods. 6. Electrode kinetics. Electron transfer kinetics. 7. Electrolysis and corrosion. 8. Industrial applications

1.5. Teaching Methodology

- lecture sessions
- Practical sessions: “cooperative work” for solving problems
- laboratory sessions

1.6. Evaluation

- written exams
- oral evaluation of the problems solved by “cooperative work”
- oral evaluation of laboratory work

1.7. Bibliography

- Z. Galus. “Fundamentals of Electrochemical Analysis”. Ellis Horwood
- P.H. Rieger. “Electrochemistry”. Prentice-Hall International Inc.
- A.J. Bard, L.R. Faulkner. “Electrochemical methods: Fundamentals and Applications”. Wiley