

ADVANCED ANALYTICAL TECHNIQUES

1.1. Identification

University:	Universidad Politécnica de Valencia									
School:	Escuela Técnica Superior de Ingeniería del Diseño									
Course:	Advanced Analytical Techniques									
ECTS:	4									
Semester:	<i>Winter</i>					<i>Summer</i>				X
Category	<i>Fundamental course</i>				X	<i>Specialisation course</i>				
Module	<i>MFI</i>	X	<i>MFII</i>		<i>MFIII</i>		<i>MSI</i>		<i>MSII</i>	<i>MSIII</i>
Teachers:	Ángel Maquieira; Luís A. Tortajada, Teresa Vidal									
Language:	<i>English</i>	X	<i>Italian</i>		<i>Swedish</i>		<i>Spanish</i>			X

1.2. Learning-outcomes

- knowledge about basis of modern analytical techniques.
- knowledge about the physical-chemical principles of the most important instrumental chemical techniques.

1.3. Competencies

▪ General

- understanding the principles of instrumental techniques.
- to have critical understanding of these tools.

▪ Specific

- to understand the basis of each technology.
- to know the applications of the instrumental techniques related with the biosensing needs.
- to be practice in the use of the different equipments including hardware and software.

1.4. Contents

1. Introduction to the instrumental techniques. 2. Molecular techniques: Infrared, UV/V molecular absorption, luminescence techniques. 3. Electrochemical techniques: Potentiometry and conductimetry. 4. Nuclear magnetic resonance. 5. Atomic spectroscopy: absorption and emission techniques. 6. Mass spectrometry. 7. Separation techniques: Chromatography and capillary electrophoresis.

8. Chemometrics: experiments design, calibration, optimization and validation methods.

1.5. Teaching Methodology

- lecture sessions
- laboratory sessions

1.6. Evaluation

- written exams
- continuous evaluation of the laboratory work

1.7. Bibliography

- **Analytical chemistry. An introduction.** *D. A. Skoog, D. M. West, F. J. Holler, S. R. Crouch. Saunders Golden Sunburst Series. Philadelphia, 2001.*
- **Principles of instrumental analysis.** D. A. Skoog, F. J. Holler, T. A. Nieman. Saunders College Publishing, Philadelphia 1998.