

SSD:**Chim/01**

Academic year: **2017/18**

Faculty: **Department of Chemistry**

Study courses: **CHIMICA ANALITICA STRUMENTALE ED ANALYTICAL CHEMISTRY OF MATERIALS**

Study plans/Curricula: **Chemistry of materials and surface chemistry - 105-8752**

Type: **Affine/Integrativa**

Total Credits: **4**

Didactic Methods: **Lectures and laboratory**

Language of the course: **English**

Didactic Period: **1° year - 2° semester (March – June)**

Exam type: **Oral**

Professor in charge: **KYRIAKI MANOLI**

Training objectives:

Learn the physical principles of XPS along with the operation principles of the main components of XPS instrument.

Understand the principles of its use for identification, qualitative, and quantitative analysis of the elemental and chemical species present in a sample

The course also involves writing and carrying out a project on surface analysis of samples using XPS. The students can acquire experience on what types of materials and problems can be tackled by XPS. They will get to know how XPS measurements are carried out, how the data are analyzed and gain experience on presenting scientific results.

Prerequisites: **Basic concepts of spectroscopy**

Didactic Methods: **Classroom lectures and laboratory**

Course programme

Lectures: 24 h

1. Introduction to surface analysis spectroscopy. Applications of XPS (X-ray Photoelectron Spectroscopy)
2. Comparison of the different techniques used for surface analysis.
3. Basic principles of photoemission spectroscopy: XPS and Auger spectroscopy.
4. XPS and Auger instrumentation
5. Analysers for Electron Spectroscopy: Transmission and étendue. Power resolving in XPS and Auger.
6. XPS analysis modes/configurations
7. XPS qualitative and quantitative analysis.
8. Analysis of samples: conductors, insulators and semiconductors. Calibration of the spectrometer and the spectrum.

Laboratory: 15 h

Reference Texts

Briggs, D., Surface Analysis of Polymers by Xps and Static Sims. Cambridge University Press: 1998.