INSTITUTO DE FÍSICA
FACULTAD DE FÍSICA

COURSE	:	**EXPERIMENTAL TECHNIQUES FOR MATERIALS CHARACTERIZATION**
TRANSLATION	:	TÉCNICAS DE CARACTERIZACIÓN DE MATERIALES
NUMBER	:	FIM4008
CREDITS	:	15 UC / 9 SCT
REQUISITES	:	FIM8340, FIM8350
CONECTOR	:	OR
RESTRICTIONS	:	030501
CHARACTER	:	OPTATIVE
FORMAT	:	LABORATORY
QUALIFICATION	:	STANDARD
FORMATIVE LEVEL	:	DOCTORATE
DISCIPLINE	:	PHYSICS

I. COURSE DESCRIPTION

This course addresses the knowledge, techniques and methods to characterize condensed matter. At the end of the course, the student will be able to choose the corresponding method to answer his scientific question, to know exactly what properties he is measuring with the chosen method to later interpret the data correctly and to know the artifacts that may be produced.

II.LEARNING OUTCOMES

1. Know and acquire mastery of the techniques and methods of characterizing condensed matter for a real materials research situation.
2. Know the equipment and the handling and applications of Electron Microscopy (SEM) and X-Ray Diffraction. C for analysis in doctoral research.

III.CONTENT

1.Diffraction methods: X-rays (XRD), electrons (LEED, RHEED).
2. Dispersion methods: Adsorption, transmission, reflection
3. Fluorescence spectroscopy.
4. Raman spectroscopy.
5. X-ray electron spectroscopy (XPS). 6.Auger Spectroscopy (AES).
7.Ultraviolet light spectroscopy (UPS).
8. Microscopic methods.
9. General aspects: Combination of dispersive methods with microscopic methods, research region: bulk, surface, depth of penetration.

IV.METHODOLOGICAL STRATEGIES

-Laboratory work

V.EVALUATIVE STRATEGIES

-Handling the equipment during laboratory work: 30%
-Written work reporting the analysis of different materials with evaluation of the analysis: 70%

VI.BIBLIOGRAPHY

REQUIRED

Czanderma, A.W. (Ed.) Method of Surface Analysis. North-Holland, 1989

Suryanarayana, C. and Grant Norton, M. "X-Ray Diffraction, A Practical Approach" Plenum Press, 1998 (548.83 S963x)

Cullity, B. D. (Bernard Dennis): Elements of x-ray diffraction / B. D. Cullity, S.
R. Stock.. Upper Saddle River, NJ : Prentice Hall, c2001.. xvxviii, 678 p. : : il..548.83 C967e

"Introductory Raman spectroscopy" John R. Ferraro, Kazuo Nakamoto, Chris W. Brown. c2003.

"Modern Raman spectroscopy : a practical approach" Ewen Smith, Geoffrey Dent. c2005

"Transmission Electron Microscopy A Textbook for Materials Science" David B. Williams

C. Barry Carter; SpringerLink (Online service).

OPTIONAL

N/A