Summary
The course's objectives are: Learning several advanced methods in experimental physics, and critical reading of experimental papers.

Content
- **Noise and interference**: Their origins, their influence on experimental results, methods for noise and interference reduction
- **Scanning probe microscopy (SPM)**: Principles of operation of the scanning tunneling microscope and atomic force microscope, Advanced scanning microscopy techniques, applications
- **Optical spectroscopies**: The elements of a modern spectroscopy system, methods of spectral dispersion and their advantages, optical detectors
- **Electron microscopy**: Transmission and scanning microscopes, their principles of operation, observation techniques, uses ...
- **Structural characterization**: RX, electron diffraction, ...

Keywords
Noise, Scanning probe microscopy, optical spectroscopy, transmission electron microscopy, scanning electron microscopy, electron diffraction, X-ray diffraction

Learning Prerequisites
- **Recommended courses**
  - Basis courses in physics

  **Important concepts to start the course**
  fundamentals of optics, electromagnetics, atomic and solid-state physics

Learning Outcomes
By the end of the course, the student must be able to:
- Integrate the notions of critical reading of articles
- Assess / Evaluate scientific articles, their quality and defaults
- Interpret knowledge of several specific experimental methods

Transversal skills
Communicate effectively, being understood, including across different languages and cultures.
Give feedback (critique) in an appropriate fashion.
Demonstrate the capacity for critical thinking
Access and evaluate appropriate sources of information.
Make an oral presentation.
Summarize an article or a technical report.

Teaching methods
- Ex cathedra lectures on specific experimental techniques
- Students' presentations of scientific articles

Assessment methods
oral exam (100%)