



Universidade do Minho



7. Curricular Unit

Advanced Physics Topics 1

Module

Advanced materials preparation and characterization

Type

Lecture course

Contact hours

18

Professor/Researcher in charge

Bernardo Almeida, U. Minho

Summary of Contents

Thin film preparation. Sputtering. Magnetron sputtering. Applications.

Laser Ablation deposition of thin films and nanostructures. Applications.

Structure and microstructure. X-ray diffraction. Low angle X-ray scattering, reflectometry, grazing incidence. Scanning electron microscopy (SEM). Transmission electron microscopy (TEM)

Infrared and Raman Spectroscopies. Lattice dynamics. Experimental setups. Applications.

Electrical properties. Dielectric relaxation. Impedance spectroscopy. Time and frequency domains.

Experimental setups. Electrical resistivity. Magnetoresistance.

Magnetic properties. Magnetic interactions and magnetization. Magnetometry. Measurement techniques.

Optical properties. Reflectance and transmittance. Absorption. Photoluminescence. Ellipsometry.

Evaluation

Final exam

Jury

Bernardo Almeida, João Ventura, Florinda Costa