



Universidade do Minho



9. Curricular Unit

Advanced Physics Topics 1

Module

Clean Room and Micro-fabrication (CRMF)

Type

Practical instruction

Contact hours

18

Professor/Researcher in charge

João Oliveira Ventura

Summary of Contents

This course will introduce, in a hands-on approach, the main microfabrication and deposition techniques used to produce functional devices in a Clean Room environment. Basic training in the use of a Clean Room, including basic facility description, operating procedures and safety instructions, will be provided. Ion beam deposition, resistive and electron-beam evaporation will be used to grow metallic and insulating thin films. The resolution and minimum feature size attainable by optical lithography will be studied using Direct Write Laser and Mask Alignment systems. Pattern transfer techniques (dry and wet etching and lift-off) will allow the comparison of their selectivity, anisotropy and etching rate. Basic characterization of the produced structures will be performed using optical microscopy and profilometry, to extract relevant parameters (thin film roughness, thickness, deposition rates and uniformity; feature sizes, distributions, etching profiles). This module will take place in the recently installed Clean Room of the Porto University, CEMUP MNTEC.

Evaluation

Essay and oral presentation

Jury

João Oliveira Ventura; Paulo Marques, Bernardo Almeida