



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Principles of Electron Microscopy and Applications to Nanomaterials Research

2324-116R-M03

Title

Principles of Electron Microscopy and Applications to Nanomaterials Research

Teacher(s)

Prof. Giovanni Maria Vanacore

Language

English

Short description

The course aims at providing an introduction to the main techniques of electron microscopy with applications to materials.

The following topics will be discussed:

- Introduction to electron optics: wave-nature of electrons; electron-matter interaction; basic layout of a

microscope.

- Transmission Electron Microscopy (TEM): imaging modes (bright and dark field), diffraction and crystallography; amplitude and phase contrasts in TEM; advanced modes of operation: High- Resolution TEM, magnetic TEM, Scanning TEM, and EELS.
- Scanning Electron Microscopy (SEM): layout of a SEM microscope; secondary electron contrast and imaging modes; Electron Back-Scatter Diffraction (EBSD).
- TEM/SEM investigation of nanomaterials for electronic, photonic and phononic applications.

CFU / Hours

1 CFU/ 8 hours

Teaching period

February 2024

Sustainable Development Goals

QUALITY EDUCATION
