



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Principles of Electron Microscopy and Applications to Nanomaterials Research

2223-116R-M3

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#### Title

Principles of Electron Microscopy and Applications to Nanomaterials Research

#### Teacher(s)

Dr. 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**

## **Sustainable Development Goals**

QUALITY EDUCATION

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