This course will provide a graduate-level introduction on Nanocharacterization explaining the fundamentals of the tools necessary to characterize or perform measurements at the nanometer scale, discussing the physics of the interaction processes for characterization, and building knowledge on various techniques and their detection limits with emphasis on those instruments that are used in cutting-edge research or in industry. Developing an in-depth knowledge in this highly evolving and interdisciplinary area will provide a wide range of attractive career opportunities. Requirements: Prior knowledge of Nano500, admission into the Graduate Certification Course on Nanotechnology and Nanoscience or permission from the Director of the Graduate Certification Course.

**Major Topics:**

Fundamental issues related to instrumentation and measurement methods at the nanometer scale.

Interactions of electrons, ions and photons with materials.


Near-field Scanning Optical Microscopy, Fluorescence Resonance Energy Transfer, Surface Plasmon Resonance.


Relevance of different characterization techniques to study problems in physical and biological sciences.

Lecture notes will be the primary source of course materials. Suggested references: