UNIVERSITA' DEGLI STUDI DI CATANIA

DOTTORATO DI RICERCA IN SCIENZA DEI MATERIALI E NANOTECNOLOGIE

COURSE DESCRIPTION

Name	Structural, morphological and compositional characterization of materials
Teacher(s)	Anna Lucia Pellegrino
Email	annalucia.pellegrino@unict.it
CFU* (lecture+lab [h])	2 CFU (9h lecture + 6h lab)
Assessment **	Oral by slide presentation

* 1 CFU = 6 h lectures OR 12 h in lab OR a combination (3h lectures+6h lab, or 4+4, or 2+8, …)

** it must be within the course duration. Please, indicate: written, oral, by slide presentation.

PROGRAM

- X-ray diffraction (XRD) technique for the identification of phases and structural study of inorganic materials: optics basis, principle of the technique, and data-processing for the extrapolation of lattice parameters and grain sizes as case study.
- Scanning electron microscopy (SEM) for morphological characterization of inorganic materials: general principles, elastic and inelastic events, tungsten filament electron beam and Field Emission Gun, detection of secondary and backscattered electrons, examples of analyses.
- Energy dispersion X-ray microanalysis (EDX) for the compositional characterization: principles of the technique, detector type, qualitative and quantitative analysis (ZAF method), map and scan-line analyses via EDX.

REFERENCES

- David Brandon and Wayne D. Kaplan, Microstructural characterization of materials, 2nd edition, Wiley;
- Slides.