

Structural, morphological and compositional characterization of materials (2 CFU)

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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.
- Elements of Wavelength Dispersive X-ray (WDX) microanalysis.

References:

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