

POSMAT I Programa de Pós-graduação em Engenharia de Materiais



Course: Characterization and Deterioration of Materials

Code: MEM.004

Credits: 03

Module: General formation

Contents:

Basic principles of analysis and characterization of materials. Analysis of particle size, density, chemical and mineralogical composition, porosity and thermal resistance. Characterization of microstructures and macrostructures of materials. Application of X-ray diffractometry to determine the crystalline structure, particle size and crystallinity of the materials. Analysis of materials by image: optical microscopy, scanning electron microscopy, atomic force microscopy and transmission microscopy. Analysis of surfaces, interfaces and coatings. Surface wear: abrasion, erosion and corrosion.

References:

1. GOLSTEIN, J. I. **Scanning electron microscopy and X-ray microanalysis**. New York: Plenum Press, 1998.
2. CULLITY, B. D. **Elements of X-ray diffraction**. 2nd. Edition. Addison-Wesley Pub, 1978.
3. BUNGE, H. J. **Experimental techniques of texture analysis**. Oberursel: DCM-Verlag, 1986.
4. EVANS, B. **Encyclopedia of materials characterization: surfaces, interfaces, thin films**. Boston: Butterworth-Heinemann, 1992.
5. SKOOG, D. LEARY, J. **Principles of instrumental analysis**. New York: Saunders College Publ., 1992.
6. VICKERMAN, J. C. **Surface analysis: the principal techniques**. New York: John Wiley & Sons, 1997. 474p.