



Course Syllabus

Department/Faculty: Engineering School
Graduate Program Materials Engineering and Nanotechnology
Degree <input checked="" type="checkbox"/> Academic Master's <input checked="" type="checkbox"/> Doctorate (PhD) <input type="checkbox"/> Professional Master's
Course Name Materials Science
Professor(s)
Office hours 48
Course Overview <p>Composition and structure of materials in the various areas of engineering activity. Relating the performance, safety and success in the technically correct use of materials influenced directly by their structures and types. Diagrams of binary phases (eutectoid and peritectoid). Phase transformations. Phase diagrams in ceramics. Diagrams of ternary and quaternary phases. Principles and applications of solidification. Structural materials. Mechanical behavior of materials. Dislocations and strengthening mechanism. Thermal behavior. Electronic, optical and magnetic materials. Oxidation, corrosion, chemical degradation of polymers and ceramics, radiation damage and wear. Fracture mechanics. Failure analysis and prevention. Selection of materials.</p>
Topics outline Phase diagrams; Phase transformations; Mechanical properties of materials; Electrical and magnetic properties; Thermal and optical properties; Processing of metal materials; Ceramics processing; Processing of polymers and composites; Failure analysis; Corrosion.
Letter Grade Assignment Grade A (Excellent) - Grade points between 9 and 10 Grade B (Good) - Grade points between 8 and 8.9 Grade C (Satisfactory) - Grade points between 7 and 7.9 Grade D (Unsatisfactory) - Grade points between 0 and 6.9



Texts, Materials, and supplies

1. CALLISTER, William D. Materials Science and Engineering: An Introduction, 7th ed. New York, John Wiley & Sons, Inc., 2007.
2. ASKELAND, Donald R. The science and engineering of materials. 3rd ed. Boston, PWS Publishing Company, 1994.
3. SMITH, William F., Foundations of Materials Science and Engineering, 2nd Ed. Singapore, McGraw-Hill International Editions, 1993.