

**The general scope of issues and topics required for the entrance exam for a master's degree in  
Materials Science, specialty Functional Materials.**

- Elements and their properties, acids, bases, salts, chemical reactions, redox reactions, fundamentals of quantum mechanics, mass and heat transport, defects, corrosion, chemical reactions in solids, solid state electrochemistry.
- Periodic structures: symmetry, group theory, point and space groups.
- Inorganic, metallic, amorphous, polymeric, organic and composite materials, nanomaterials: structure, microstructure, bonding, optical, magnetic and elastic properties.
- Technology of materials: synthesis, sintering, solidification, polymerization.
- Materials characterization methods: XRD, SEM-EDS, spectroscopic methods, electrochemical methods.
- Calculus, statistics.
- Computer science basics: data structures, data transformation, representation and visualization, algorithms, internet, protocols and standards.