**Midterm questions on discipline «Modern technology for obtaining of nanoobjects and nanostructures»**

1. Scaling laws for length and time and its effect on modeling.
2. Nano-scale materials and systems.
3. Measurement methods in nano-scale.
4. Analysis and design tools for nano/micro-scale systems.
5. Material Properties in nano-scale.
6. Grain size effect on materials properties (mechanical, electrical, magnetic, etc.).
7. Multilayered structures, nanocluster composites crystals: lattices, nanocrystals and nanoparticles.
8. Adhesion, nanotubes, nanowires, quantum dots.
9. Micro-nanodevices and Micronanomachines.
10. Semiconductor/IC circuits (chips, switches) MEMS Devices.
11. Manufacturing techniques and processes.
12. Fabrication of cantilever beam arrays
13. Pumps and gauges thin films: processes, evaporation, dry and wet etching, sputtering deposition, CMP, bonding and embossing characterization.
14. Optical techniques/microscope, SEM, optical and electrical,
15. Testing and characterization
16. Interferometric and acoustic testing methods.

References

1. General Chemistry and principles: Burdge, J: Chemistry, 2nd Edition. McGraw-Hill, 2010.
2. Sol-gel synthesis: Sol-Gel Science: The Physics and Chemistry of Sol-gel Processing. Brinker, C.J.; G.W. Scherer, Academic Press, 1990.
3. Applied Electrochemistry. Thompson, Maurice de Kay, The MacMillan company (available on line at: http://www.archive.org/stream/appliedelectroch00thomrich#page/n5/mode/2up) Chapter III, IV, V. Online source at: http://www.tannerm.com/electrochem.htm
4. Virtual Chemistry Textbook: A reference text for General Chemistry by Stephen Lower. Available online at: http://www.chem1.com/acad/webtext/virtualtextbook.html