Syllabus
Fall 2013 - CHEMISTRY 650G
Nanochemistry

Instructor= Tao Xu,
Office=FW 412 (also called LaT 412)
Contact: Tel =(815)753-6357 Email = txu@niu.edu (short e-mail questions)
Credit hours=3
Lecture Hours and Location– Tuesday and Thursday 11am-12:15pm FR205
Office Hours –Tuesday, 1:30am-3:30pm in FW412
Teaching Assistant: Not Available
Course websites: Not Available

Assessments and Intended Learning Outcomes: This course emphasizes on the applications of nanoscale materials and devices. The basic science underlying the applications and the fabrication methods of the devices will be examined accordingly. Experimental work will be involved in this course. Student Assessment including two taking-home projects (30 points for each one), and one final presentation (40 points). Students are expected to grasp basic technique skills in nanochemistry such as SEM, AFM, synthesis of certain nanostructures, understanding the physical chemistry governing the nanoscale phenomena etc.

Proposed course contents and schedule
   Electronic properties of atoms and solids
   Effects of the Nanometer Length Scale
   Microscopic and surface spectroscopic techniques (AFM*, SEM*, TEM, XPS, RAIRS, etc. *hands-on)

   Quantum dots for solar cells
   Quantum dots for light-emitting diode
   Molecular electronics
   Nanoparticles for catalysts and targeted drug delivery and release
   Project #1 will be assigned on Oct. 1

   Nanotube/nanowire-based field-effect transistors for biosensing
   Nanowires/nanotube for gas sensing
   Piezoelectric nanowires as nanogenerator
   Thermoelectric Nanowires
   Project #2 will be due on Oct. 15, Project #2 will be assigned on Oct.31
   A Single Nanopore for DAN sequencing
   Nanoporous anodized aluminum oxide (Hands-on synthesis)
   Nanoporous metal-organic framework for gas absorption
   Nanoporous materials for Li-ion battery applications
   *Project #2 will be due on Nov.12. Final project will be assigned on Nov.19*

5. Oral presentation and defense on Final Project (Dec.3 and Dec.5)

**Reading Material**
The recommended textbook for this class is *Nanoscale Science and Technology* by Robert Kelsall, Ian Hamley and Mark Geoghegan. Research papers and review articles will be made available during the semester.

**Class Policy**
Full attendance at all class meetings is required. Tardiness or leaving early must be avoided in order for the class to be productive for all. Students are strongly encouraged to participate in class discussion and ask questions during class. No make-up work no extra credit.

**Taking-home Projects**
Two taking-home projects will be assigned during the semester. Each student receives different subject. Therefore, each student must work on his/her own.

**Final Project**
At the end of the semester each student will give a 20-minute PowerPoint oral presentation on a specialized subject related to the topics covered in class. The subjects will be assigned during the semester. Students will study these subjects independently, under the general guidance of the instructors.
In addition to the oral presentation, each student will prepare a written summary.
Grades for this class will be based on the two projects and the final presentation.

**Incomplete grades**
Incompletes will only be given under extraordinary circumstances such as extended illness or call-up to active military duty.

**Receiving Assistance**
Students are urged to contact me should they have questions concerning course materials and procedures. If you have a disability or any other special circumstance that may have some impact on your course work and for which you may require accommodations, please contact us early in the semester so that arrangements can be made with the Center for Access-Ability Resources (CAAR), [http://www.niu.edu/caar/](http://www.niu.edu/caar/).
**Academic Integrity Statement**

All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither give nor receive unauthorized assistance. Any violation of this standard must be reported to the Office of Student Conduct.

http://www.niu.edu/communitystandards/