Characterization, Fabrication and Manipulation at Nanometer Scale

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http://www.phys.sinica.edu.tw/TIGP-NANO/Course/2015_Spring.htm

http://www.phys.sinica.edu.tw/~nano/

Course Objectives

This course intends to familiarize students with some standard methods and techniques employed in current research related to nanoscale characterization, fabrication and manipulation. The emphasis, besides given lectures, has also been placed on the student's ability to apply the acquired knowledge to studying a recent relevant article and to present it to the audience at an understandable level.

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Syllabus (2015)

Week 01 (2/26)	Overview and Lab Tour
Week 02 (3/05)	EM: structure and working principles (Prof. Chen, NTHU)
Week 03 (3/12)	EM: operations and examples (Prof. Chen, NTHU)
Week 04 (3/19)	STM: structure and working principles
Week 05 (3/26)	SPM: structure and working principles
Week 06 (4/02)	Spectroscopy I: optical and electronic
Week 07 (4/09)	Spectroscopy II: optical and electronic
Week 08 (4/16)	Quantum transport in nanostructures
Week 09 (4/23)	Midterm Written Exam (40%)
Week 10 (4/30)	Atomic manipulations and optical tweezers
Week 11 (5/07)	Thin film deposition
Week 12 (5/14)	Growth of nanomaterials
Week 13 (5/21)	Lithography: optical, e-beam (Prof. Chen, AS)
Week 14 (5/28)	Papers study
Week 15 (6/04)	Papers study
Week 16 (6/11)	Papers study
Week 17 (6/18)	Papers study
Week 18 (6/25)	Presentation and report (60%)

Grading of this course

- ✧ Midterm Written Exam (40%)
- ✧ Presentation and report (60%)
  - Presentation (30 minutes, 45%)
    Students should prepare power-point slides from the paper assigned in the beginning of this course, and present them in a way that is understandable to their classmates. The suggested format is 20 min for presentation and 10 min for answering questions from the audience.
  - Report (at most two pages, 15%)
    Students should write a report on:
    1) The paper assigned in the beginning of this course, including a) synopsis of the paper and b) what can be further studied from this paper.
    2) Afterthoughts and feedbacks about her/his presentation and the whole course.