

PME 3349 Nanotechnology and its applications

奈米科技與應用

Instructor:

Ming-Huang Li

Objectives:

This course is intended for the university student who would like to expose herself or himself to the field of microelectromechanical systems (MEMS) and nanoelectromechanical systems (NEMS). This course will focus on the microfabrication technologies, micromechanics, and applications of micro- and nano-devices.

Prerequisites:

General Physics, Mechanics of Materials, Engineering Mathematics, Electrical Circuits

Grading:

Mid-term Exam (30%)

Final Exam (30%)

Homework and/or Individual report (20%)

Group report and/or Term Project (20%)

Textbook:

Lecture Notes.

Key References:

1. Hong Xiao, *Introduction to Semiconductor Technology 2nd ed.*, SPIE Press, Bellingham, Washington USA, 2012.
2. Silvan Schmid, Luis Guillermo Villanueva, and Michael Lee Roukes, *Fundamentals of Nanomechanical Resonators*, Springer International Publishing Switzerland 2016.

Tentative Course Outline:

- (1) Introduction to nanotechnology
- (2) Micro and Nano Fabrication Technologies
- (3) Materials for Nano Devices
- (4) Micromechanics
- (5) Electro-mechanical Modeling of Transducers
- (6) Noise in Nanomechanical Systems
- (7) Interface Circuits
- (8) Measurement and Characterization Techniques