CHE 596-017
Conventional and Emerging Nanomanufacturing Techniques
Fall 2011

Brief description

The goal of this course is to introduce students to surface patterning techniques that are useful for nanomanufacturing. The lecture schedule (below) is tentative, but provides a glimpse of the topics to be covered. The first part of the course will cover conventional surface patterning techniques with particular attention to photolithography (the keystone process for creating modern electronics) as well as alternative methods such as imprint and soft lithography. The second part of the course will cover thin films, instabilities, and unconventional nanofabrication techniques.

Time

Tu / Th 8:05-9:20 am, EB-2 room 1220

Instructor

Prof. Michael Dickey, mddickey@ncsu.edu
Assistant Professor, Chemical and Biomolecular Engineering
Background in nanofabrication, thin films, photosensitive materials, electronics processing

Lecture schedule

1. Overview of conventional nanofabrication
2. Photolithography: overview / field trip
3. Photolithography: Materials
4. Photolithography: Optics
5. Imprint Lithography / Photopolymerizations
6. Soft Lithography / Microfluidics
7. Thin film preparation / characterization techniques
8. Surface wetting / surface tension / van der Waals
9. Week 8 Continued
10. Thin Films: Instabilities (buckling, electrohydrodynamics, dewetting, etc)
11. Thin Films: Instabilities
12. Self-assembly / Directed Assembly
13. Unconventional Fabrication / Stretchable Electronics
14. Projects
15. Projects / Review