E SC 212
Nanotechnology Processes

Lithography

Etching

The Top-down Fabrication Methodology

Material Modification

Depositing

offered in an on line format

http://www.engr.psu.edu/cde/courses/esc211/index.htm
This course will be offered in a total on line format. There are video lectures, handouts, reading assignments and interactive labs in this course.

You will need a high speed internet connection and access to a scanner to complete this course.

Penn State uses ANGEL as its course management system.

This is a three credit undergraduate course. You must apply to Penn State as a non-degree undergraduate student to take this course.
Instructors:

- Dr. Stephen J. Fonash, Kunkle Chair Professor of Engineering Sciences,
- Mr. Terry Kuzma, Instructor, NMT Program
- Dr. Wook Jun Nam, Research Associate, NMT Program
- Mr. Sebastian Maeder, Research Assistant, NMT Program

Questions will be handled via email NMT@engr.psu.edu or telephone (814-865-9635)
Textbooks (required):

► Nanostructures & Nanomaterials; Synthesis, Properties & Applications by Guozhong Cao [ISBN 1-86094-480-9]

Course Objectives

► Self Assembly
► Anisotropic and isotropic etching
► Wet and dry etching
► Physical deposition
► Lithography
► Characterization
Grading

Exams - 40%
Lab Activities – 40%
Homework – 20%

The standard grading system will be used to assign final letter grades in the course.

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<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>93-100%</td>
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<td>90-92.9%</td>
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<td>87-89.9%</td>
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<td>60-69.9%</td>
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<td>F</td>
<td>0-59.9%</td>
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Homework (20% of your grade)

- There will be 8 homework assignments
- These assignments will be problem sets
- Homework assignments will be handed in electronically via the homework drop boxes on Angel

- Late Policy:
  - 12 hours late will receive 30% off
  - 24 hours late will receive 50% off
  - No late homework will be accepted after 24 hours
Exams (40% of your grade)

- There will be 4 exams *(each worth 10% of your grade)*

- All exams will be done on-line and have a two hour time limit. Exams are scheduled for weekends to give you maximum flexibility.
Lab Activity

Lab Activity (40% of your grade)

- There will be 10 lab activities (each worth 4% of your grade)
- This class offers a working knowledge of nanomanufacturing so the online lab activities are very crucial
- Lab activities can be assigned on video content or pre-scheduled live interactive exercises
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Nanotechnology Processes

• Any questions can be directed to:
  Terry Kuzma
  NMT@engr.psu.edu
  or telephone
  (814-865-9635)