E SC 211
Material, Safety and Equipment Overview for Nanotechnology

Au NP-functionalized DNA

offered in an on line format

http://www.engr.psu.edu/cde/courses/esc211/index.htm
This course will be offered in a total online 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

► Plasma processing summary and specific safety and environmental issues
► Physical vapor deposition summary and specific safety and environmental issues
► Chemical vapor deposition summary and specific safety and environmental issues
► Lithography processing summary and specific safety and environmental issues
► Characterization tool summary and specific safety and health issues
Course Objectives

- OSHA lab standard safety training
- BSL guidelines
- Gas and liquid materials handling, disposal, and detection
- Nanoscale particle handling and disposal
- Cleanroom protocol
- Wet bench protocol
- Wet processing summary and specific safety and environmental issues
- Vacuum processing, operation principles of pumps, gauges, and hardware
Grading
Homework (8) – 18%
Exams (4) - 40%
Lab Activities (7) – 42%

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

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<th>Grade</th>
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<tr>
<td>A</td>
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Homework (18% of your grade)

► There will be 8 homeworks

► 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  (42% of your grade)

► There will be 7 lab activities (each worth 6% 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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• Any questions can be directed to:
  Terry Kuzma
  NMT@engr.psu.edu