

Instructor: Dr. Jim P. Zheng

Room 346

Lecture Hours: MWF: 12:55-1:45pm

Office Hours: MW: 10:00-11:00am

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Email: zheng@eng.fsu.edu<http://www.eng.fsu.edu/~zheng/>**Prerequisites:** EEL3300, or equivalent (grading C or better)**Textbook:** Fundamentals of Nanotechnology, G.L. Hornyak, J.J. Moore, H.F. Tibbals, and J. Dutta, CRC Press, Boca Raton, 2009.**Course Topics:**

This course will introduce the underlying principles and applications of the emerging field of nanotechnology, intend for a multidisciplinary audience with a variety of backgrounds, introduce scientific principles and theory relevant at the nanoscale dimension, and discuss current and future nanotechnology applications in engineering, electronics, computing, energy, materials, physics, chemistry, biology, and medicine.

Instructional Objectives:

At the conclusion of this course, students should be able to

1. Demonstrate a working knowledge of nanotechnology principles and industry applications.
2. Be able to explain the nanoscale paradigm in terms of properties at the nanoscale dimension.
3. Apply key concepts in chemistry, physics, biology, and engineering to the field of nanotechnology.
4. Ability to identify current nanotechnology solutions in design, engineering, and manufacturing.
5. Apply knowledge and skills of nanotechnology principles to a potential project application.
6. Ability to search and read current nanotechnology literature applied to a particular problem domain.
7. Identify societal and technology issues that may impede the adoption of nanotechnology.
8. Identify career paths and requisite knowledge and skills for career change towards nanotechnology.

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| Grading: | 2 Midterm Examinations: | 40% | (20% from each exam) |
| | Homework: | 15% | |
| | Projects: | 20% | |
| | Final examination: | 25% | |

Grading scale: **A: >90%, B: 80-89%, C: 60-79%, D: 45-59%, F: <45%**

These breakpoints may be lowered slightly depending on overall class performance.

Project Assignment:

In the assignment you'll review a commercial application of nanotechnology. It should be a product or technology that is being prepared for market, but it doesn't have to be on the market yet. You'll review the technology, the product, how nanotechnology is addressing a specific need. Your assignment should focus on four key areas; first the company, second, the technology, third, the device or product itself, and fourth, the size of the market. Think of these four perspectives as corners of a square, and tell your story from the middle of the square. All four corners are important. The goal of this assignment is to learn about the most current nanotechnology that is closest to the market, and to understand how young companies are approaching the needs of the market with the most current technologies available.

Your assignment should be about 1,000 to 1,500 words, meaning from three to five pages in length. Write an executive summary if you wish. Start your assignment by picking a product or application of interest, then researching the technology, with an emphasis on the problem that is being solved. Take time to understand the size of the market, the magnitude of the problem, and some rough estimate of the value of the technology. There are qualitative and quantitative measures of technology value, including the value of having 'first mover advantage'.

Policy Statements:

- Attendance is mandatory.
- Coming late (5 minutes) or leaving early (5 minutes) will be considered as the absence from class.
- Homework is due at the beginning of class.
- The general policy is no makeup exams and quizzes. In the event of an excused absence, you must notify the instructor prior to the exam to discuss proper procedure.
- Cellular phones and beepers must be turned off in the classroom.
- There is renewed emphasis on the Honor Code. Violation of this code can result in course failure and/or dismissal from the College of Engineering.