

## ECH 6937/4905 - Material Self-Assembly Over All Length Scales (Spring 2020)

**Class Hours:** M, Periods 9-11 (4:05 PM ~ 7:05 PM) in LAR 239

**Instructor:** Peng Jiang, Professor of Chemical Engineering  
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Office Hours: W 1:00 PM ~ 3:00 PM

**Content:** This course introduces students to interdisciplinary nanoscience and nanotechnology. It shows how nanometer and micrometer scale building blocks with a variety of shapes, compositions and surface functionalities can be assembled spontaneously into unprecedented and functional nanostructures.

**Textbook:** Ozin and Arsenault, *Nanochemistry: A Chemical Approach to Nanomaterials*, 2<sup>nd</sup> edition. RSC Publishing (2009) (Recommended)

**Topics:**

1. Photolithography and soft lithography
2. Layer-by-layer self-assembly
3. Nanocontact printing and writing
4. Nanorod, nanotube, nanowire self-assembly
5. Nanocluster self-assembly
6. Microsphere self-assembly and colloidal photonic crystal
7. Microporous and mesoporous materials
8. Block copolymer self-assembly
9. Biomaterials and bioinspiration

**Software Use:** All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

**Grading:** Class attendance and classroom performance: 10%, Mid-term exam: 40%, Proposal: 50% (presentation: 25%, proposal: 25%)

**Exam:** One in-class mid-term exam (2 hours, open books and open notes) will be in written short answer format.

**Homework:** Problems will be assigned throughout the semester to help understand lectures. They will not be graded and answers to the assigned problems will be discussed in class.

**Proposal:** The topic of the research proposal is any area of nanoscience and nanotechnology. It aims to assist students in developing original research ideas in new areas, and in presenting these in such a way as to persuade a critical reviewer of both the merit of the research and the soundness of the method. The length of the proposal is about 2000 words (excluding references).

### Academic Honesty:

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