**Nano-/Bio-materials** **Fall 2012**

**Instructor:** Chao-Min Cheng
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**Office Hours:** By appointment
**Lecture:** Tuesday 1:10 PM to 4:10 PM

**Course Goals:** This course will provide students with an introduction to nanomaterials and biomaterials used in different kinds of applications. We will survey important classes of nanomaterials (e.g., carbon-based nanomaterials and quantum dots) and biomaterials (e.g., naturally-derived biomaterials and polymeric biomaterials), discussing material preparation, processing, properties and applications. We will also offer an experimental section about the preparation and micropatterning of actin filaments.

**Textbook:** N/A; class notes/journal papers/magazine articles

**Grades:**
Report (assignment) (4) 40%; 250 words (in English)
Exam (1) 20%
Final Report & Presentation 40%; 1000 words (in English)

**Approximate Schedule:**
Week 1: Introduction to nanomaterials
Week 2: Carbon-based nanomaterials (e.g., CNT/graphene)
Week 3: Quantum dots/nanoparticles (e.g., CdSe)
Week 4: Preparation of nanomaterials (e.g., self-assembly) [Report]

Week 5: Introduction to biomaterials
Week 6: Naturally-derived biomaterials (e.g., collagen)
Week 7: Naturally-derived biomaterials/Polymeric biomaterials (e.g., PE/PDMS)
Week 8: Polymeric biomaterials [Report]

Week 9: Midterm

Week 10: Application (i) **Nanoelectronics**
Week 11: Application (ii) **Tissue Engineering**
Week 12: Application (iii) **Chemical-/Biological-Sensing** [Report]
Week 13: Application (iv) **Nano-/Micro-fluidics**
Week 14: Application (v) **Point-of-care Diagnostics** [Report]

Week 15: Project presentation [Report]