UNIVERSITY OF CALIFORNIA, DAVIS
Department of Chemical Engineering and Materials Science

EMS 289C: More Advanced Functional Properties of Materials (CRN: 32209)
3 units, TR 1:40-3:00pm, 1130 Bainer Hall

COURSE OUTLINE – Spring 2015

Instructor: Professor Yayoi Takamura
2009 Kemper Hall
email: ytakamura @ ucdavis.edu
Office hours: W: 2:00-3:00 pm or by appointment
Course webpage: SmartSite

Textbook: No specific textbook will be required for the class. Readings will be posted on the course SmartSite and will consist of sections from various textbooks (examples are listed below) and journal articles.

Prerequisites: Graduate standing in Engineering, Physics, or Chemistry. Completion of EMS 272 is recommended.

Grading:
Homework 60%
Final Oral presentation 40%

Course Policies:
1. Homework is due in class on the specified due date. No late homework will be accepted.
2. Unless you are instructed otherwise, you may discuss homework problems with other students in the class, but submitted work must be your own. The UC Davis Code of Academic Conduct will be strictly enforced. (see http://sja.ucdavis.edu/cac.html)
3. It is expected that students will abide by the UC Davis Principles of Community (see http://principles.ucdavis.edu/).

Note: EMS 289C is a temporary course number for courses before they get approved for a permanent course number. Therefore, it shows up as Physics and Chemistry of Materials and it is a variable unit class. Please make sure to enroll for 3 units for this version of the class.
EMS 289C: More Advanced Functional Properties of Materials

Tentative List of Topics - Spring 2015

- Electronic properties in nanostructures
- Scanning tunneling microscopy/spectroscopy
- Metal oxide semiconductor (MOS) transistors
- Ferroelectrics/Piezoelectrics
- Magnetic properties of materials
  - Atomic origins of magnetism
  - Diamagnetic materials
  - Paramagnetic materials
  - Ferromagnetic materials
    - Ferromagnetic metals
    - Dilute magnetic semiconductors
    - Magnetic oxides
  - Antiferromagnetic materials
  - Ferrimagnetic materials
  - Ferromagnetic domains
  - Anisotropy
  - Magnetic devices/spintronics
- Magnetic characterization techniques