

MAE 166 /NANO 156 -- Nanomaterials & Properties (UC San Diego, Fall 2014)

Instructor: Prof. Sungho Jin

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Class: Tu – Th, 8:00 – 9:20 am (Warren Hall, WLH, Rm. 2205)

Office Hour: Th: 4:00 – 5:00 pm, Rm. 256, EBU II

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Midterm exam: **Th**, November 6, 2014 (tentative), 8:00 – 9:20 am (WLH, Rm. 2205)

Final exam: **Tu**, December 16, 2014, 8 – 11 am (Rm : TBA)

Class website: http://newmaeweb.ucsd.edu/courses/MAE166/FA_2013

Course Description

This course will cover physical and chemical synthesis/processing techniques for creating nanomaterials, as well as interesting physical properties and applications of various types of nanomaterials including nanostructured metals/ceramics/composites, nanowires such as carbon nanotubes, graphene, quantum dots, nano-fabrication/nano-patterning, self assembly, magnetic nanomaterials, and bio-related nanomaterials. Some recent advances in nanomaterials, innovation and patent-related aspects, microstructural characterization of nanomaterials will also be covered. While there is no particular text book for this course, some chapters and sections of various books will be utilized as the basis for the course. Class handouts, reading assignments, homework/term paper, and small-group projects will also be utilized.

Grading Policy

The course grading will be based on Midterm (25%), Final Exam (35%), Homework and Term Paper (20%), and Group Project/Presentations (20%).

Reference Books

1. *Handbook of Nanoscience, Engineering and Technology*, edited by W. A. Goddard, D. W. Brenner, S. E. Lyshevski, G. J. Iafrate, CRC Press, New York 2003.
2. *Nanoparticles and Nanostructured Films*, edited by J. H. Fendler, Wiley-VCH, New York 1998.
3. *Nanostructured Materials and Nanotechnology (concise edition)*, edited by H. S. Nalwa, Academic Press, New York 2002.
4. *Quantum Dots and Nanowires*, edited by S. Bandyopadhyay and by H. S. Nalwa, American Scientific Publishers, Stevenson Beach, CA, 2003.
5. *Carbon Nanotubes*, edited by T. W. Ebbesen, CRC Press, New York 1997.
6. *Handbook of Nanotechnology*, 2nd Edition, edited by B. Bhushan, Springer, 2007.
7. *Principles of Materials science & Engineering*, William F. Smith, McGraw Hill (1999).
8. *Fundamentals of Materials science & Engineering*, William F. Smith, McGraw Hill (1999).
9. *Elements of Materials science & Engineering*, L.H. van Vlack, Addison-Wesley.