

**SUMMER 2005 COURSE ANNOUNCEMENT
FOR ECE 600-02**

NANOSTRUCTURE SELF-ASSEMBLY

**R. W. Cohn, Professor ECE,
Distinguished University Scholar & Director
ElectroOptics Institute & Nanotechnology Center**

**ECE 600-02 is offered 9:30 - 10:45 MWF, Rm 306, Lutz Hall
(Ernst 110 when Rm 306 is double booked)**

Self-assembly is one of the most exciting topics in current nanotechnology research. Crude directions and vague instructions given by humans can evolve simply into precisely assembled and positioned nanostructures that can exhibit unusual geometries and functions. This bottom-up process is quite unlike the traditional engineering approach of top-down assembly which requires extremely precise and expensive lithography tools such as electron beam pattern generators or x-ray exposure tools. Self-assembly results from energetically favorable reactions. Therefore, principles of thermodynamics and, to a lesser degree, kinetics can be used to develop an intuition for when self-assembly can be expected to occur. In this course we will review these fundamentals and examine how they are being applied in a number of current research projects both at UofL and around the world.

***Nanotechnology Courses:* This special topic course is one of a series of three courses that have evolved from Professor Cohn's research activities since 2000. The two other courses are *Introduction to Nanotechnology* (to be reoffered Spring 2006) and *Foundations of Polymer MEMS* (first offered Spring 2004.)**

***Main texts:* P. Gordon, *Principles of Phase Diagrams*
D. A. Porter and K. E. Easterling, *Phase Transformations*
Individualized readings by each student of the current literature**

***Prerequisites:* Graduate standing or consent of instructor. Students from all engineering departments, physics, chemistry, biology and molecular biology would find this course to be useful and are invited to attend.**