Syllabus - ELEN 689 Special Topic:
Thin Film Science and Technology

Instructor: Dr. Haiyan Wang
Course is to be offered in spring 2006

Prerequisite
In general, you need to be a graduate student to register this class.

Frequency: Tuesday and Thursday, 11:10AM-12:25PM ZACH 322

Course topics:
This graduate course focuses on thin film science and technology widely applicable in electronic and semiconductor industry. Topics include, but are not limited to, crystal structures and defects in thin films, the basic nucleation and growth mechanisms of thin films (growth models, lattice matching epitaxy and domain matching epitaxy), thin film processing techniques (CVD, MOCVD, MBE, PLD, Laser-MBE etc.), thin film growth instrumentation aspect (energy source, chamber configurations, vacuum systems and growth controllers), and several advanced topics related to defect and dislocation control during the growth of thin films for electrical and optical devices.

Course text books
I will use multiple books as references for this course. A partial list of references is listed below. Handouts and journal papers will also be distributed to serve as course references.

1. Electronic Thin Film Science for Electrical Engineers and Materials Scientists, by K-N Tu, J. W. Mayer and L. C. Feldman, 1992.
2. Materials Science of Thin Films: Deposition and Structure, by M. Ohring, 2002.
3. Elements of X-ray Diffraction, 2nd Edition, by B. D. Cullity, 1978.
4. Introduction to Dislocations, by D. Hull and D. J. Bacon, 4th Edition, 2001.