Course Outline

Physics 822 – Lasers and Nonlinear Optics **Spring '01**

Cass Sackett Office: 155 Phone: 4-6795

Text: Yariv, *Quantum Electronics*
Supplemental: Siegman, *Lasers*
CRC *Handbook of Nonlinear Optics*

I. Physical Optics
- Ray matrices
- Gaussian beams
- Resonators

II. Laser Mechanism
- Density matrix
- Gain, power output
- Broadening, saturation

III. Specific Laser Systems
- Solid state, gas, diode, dye, excimer
- CW techniques
- Pulsed techniques

IV. Modulation of light
- Electooptic
- Acoustoopic

V. Nonlinear Optics
- Coherent scattering, nonlinear susceptibility
- Second harmonic generation
- Sum, difference frequency generation
- Optical parametric amplification
- Four wave mixing, Raman scattering

Grading:		
	Paper	30%
	Presentation	30%
	Homework	40%