Department of Electrical and Electronic Engineering, California State University, Sacramento

***EEE 265 Optoengineering**, 4 units*
Spring 2009, Section 1, Call No. xxxxx, Tues/Thur 10:30 - 11:45 A.M. Sequoia Hall Room 450

Course Content: Generation, propagation and detection of light. Fresnel equations, Snell's law, diffraction, polarization and interference. Operating principles of LED's, lasers, photodiodes and optical fibers. Introduction to Optical Communication Systems, integrated optical devices and optical instrumentation.

Textbook: ***Optoelectronics and Photonics: Principles and Practices***, Safa O. Kasap, Prentice Hall Europe, 1st Edition, 2001. ISBN: 0-201-61087-6
Text is on 24 hr checkout in the reserve room of the library.

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Office Hours: See my website for current office hours or by appointment

Grading:

Midterm 1	20%
Midterm 2	20%
Final Exam	25%
Term Paper	10%
Laboratory Reports	25%

All homework assignments and solutions, handouts and other items of interest will be posted on my website. Students should have a Saclink account as this course may be moved to WebCT during the semester.

Homework: Problems shall either be from the textbook or created by the instructor. Homework is not collected nor counts towards your grade. Check my website for homework assignments. All homework material is testable whether covered in class or only in the homework assignment.

Exams: There shall be two midterm exams and a final exam during the semester. Each shall have similar formats and will be open notes and book. Only those notes, handouts, and textbook used in this course, EEE 265, Spring 2009, shall be allowed. **Prior** permission is required for all make-up exams. Be prepared to show your student ID (one card) in order to take the exam.

Term Paper: Each student shall be required to pick a relevant topic in the area of optical engineering design and write a technical paper. The paper shall be due on the Thursday March 26, 2009. Guidelines shall be provided.

Grading Policy: Grades may be curved at the instructor's discretion. The class average will be in the B range. Typical grades ranges are:

A - 90 and above	C - 70 - 79	F – Below 60
B - 80 – 89	D - 69 - 60	

EEE 265 - Section 1 - Course Outline – Spring 2009

Week	DATE:	SECTIONS:	TOPICS:
1	01-27	1.1-1.2	Introduction: Wave Nature of Light.
	01-29	1.3 – 1.5	Group Velocity, E & B fields in Light, Snell's Law
2	02-03	1.6 – 1.7	Fresnel Equations, Interference
	02-05	1.8 – 1.10	Coherence, Diffraction
3	02-10	2.1 – 2.2	Slab Waveguide, Dispersion
	02-12	2.3 – 2.5	Step Index Fiber, Numerical Aperture, Dispersion in single mode fibers
4	02-17	2.6 – 2.10	Optical Bandwidth, Graded Index Fiber, Scattering, Attenuation in Fibers
	02-19	3.1 – 3.2	Semiconductor concepts, Energy Bands
5	02-24	3.3 - 3.4	pn Junction principles, pn Junction Band Diagram
	02-26	**MIDTERM I**	Chapters 1, & 2
6	03-03	3.5 – 3.9	LED's
	03-05	4.1 – 4.7	Stimulated Emission, Gas Lasers
7	03-10	4.8 – 4.10	Laser Oscillation, Laser Diode, Rate Equation
	03-12	4.11 – 4.15	Light emitters for Optical Fiber
8	03-17	5.1 – 5.5	Photodetectors, pin detector
	03-19	5.6 – 5.8	Avalanche Photodiode Heterojunction Photodiodes, Phototransistors,
9	03-24	5.9 – 5.10	Heterojunction Photodiodes, Phototransistors, Photoconductive detectors, Noise in Photodetectors
	03-26	6.1 – 6.3	Photovoltaic Devices
10	03-31		Spring – Break
	04-02		Spring – Break
11	04-07	6.4 – 6.6	Equivalent Circuit, Temperature effects, Materials
	04-09	7.1	Polarization
12	04-14	7.2 – 7.4	Birefringence
	04-16	**MIDTERM II**	Chapters 3, 4 & 5
13	04-21		Review Midterm II
	04-23		
14	04-28	7.5 – 7.6	Electro-Optic Effects, Optical Modulators
	04-30	7.7 – 7.8	Acousto-Optic Modulator, Magneto-Optic Effects,
15	05-05	7.9	Non-Linear Optics
	05-07	Handout	Design Considerations for a Fiber Optic System.
16	05-12	Handout	Fiber optic sensors
	05-14		Review and wrap-up
17	05/21	**Final Exam**	**10:15 a.m. – 12:15 p.m.**