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

## EEE 167 Electro-Optical Engineering Lab, 1 unit

Spring 2010, Section 1, Call No. 36778, Mon 3:00 – 5:40 P.M. Santa Clara Hall (SCL) Room 1108

**Course Content:** Provides senior level undergraduates with hands-on experience in optical engineering and design. Experiments involving laser characteristics, spectral radiometry, diffraction, polarization, modulation of light and spatial filtering.

**Textbook:** Laboratory Procedure Handouts are provided.

References: Kasap, S., Optoelectronics and Photonics, Principals and Practices, Prentice-Hall, 2001

Wilson, J. and Hawkes, J., <u>Optoelectronics: An Introduction</u>, Prentice-Hall, 1997 Keiser, G., <u>Optical Fiber Communications</u>, McGraw Hill Inc. Publishing Co. 1991 Saleh, B., and Teich, M., Fundamentals of Photonics, J. Wiley & Sons, 1991

**Instructor:** Russ Tatro Office: Riverside 5010

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Office Phone: 278-4878 Lab Phone: 278-4578

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

**Grading:** Laboratory Reports 100%

**Attendance:** On-time attendance is mandatory. Unexcused tardiness or absence will result in score reductions for the lab reports. Attendance will be noted for every lab session.

Late: 15 minutes = - 5 points

30 minutes or more but still attended the lab = -20 points

Unexcused absence: One week long lab = -90% for each occurrence

Two week long lab = -50% for each occurrence

All lab procedures, assignments and solutions, handouts and other items of interest will be posted on my website.

## **LABORATORY PROJECTS:**

- 1. Students acquire hands-on experience with various optical and electrical engineering instrumentation, including the Spiricon LBA-100 Beam Analyzer, Burleigh Spectrum Analyzer, Newport Optical Power Meter, Hewlett-Packard function generators, Tektronix oscilloscopes, Melles Griot Helium-Neon lasers, tunable lasers, beam splitters, dichroic polarizers, electrooptical modulators, KOP-100 Fiber Optic Modules, Liquid Crystal Displays, thin lenses, and diffraction gratings. The list of Experiments/projects is attached. Each experiment will have its own detailed Handout.
- 2. Computer usage consists of PC-based OptSim software set up at a workstation in the lab. Optional software that can be used to support projects includes LabView and MatLab.
- 3. Students will work in lab groups of 2-3 and record their findings. Each student is required to turn in individual lab reports for each project a week following the session. See the website for requirements of each report.
- 4. Due dates for laboratory reports are given during the lab. Late reports will receive no credit.

**EEE 167 – Section 1 - Course Outline – Spring 2010** 

Week	DATE:	Lab Title	TOPICS:
1	01-25	Lab 1	Introduction & Laser Safety
2	02-01	Lab 2	Wavelength of Laser Light
3	02-08	Lab 3	Polarization of Light
4	02-15		Campus-wide furlough day – No Lab.
5	02-22	Lab 4	Linear Attenuation in Optical Fibers
6	03-01	Lab 5	LED Characterization
7	03-08	Lab 6	Brewster's Law and Fresnel Equations
8	03-15	Lab 7	Photodetector Characterization
9	03-22	Lab 8	Beam Parameters of a He-Ne Laser
10	03-29		Spring Break
11	04-05	Lab 9	Liquid Crystal Displays
12	04-12	Lab 10	Fiber Optic Communication Links
13	04-19	Lab 10 cont.	Fiber Optic Communication Links
14	04-26	Lab 11	Fiber Optic Communication Links "Dry" lab
15	05-03	Lab 12	Solar Cell
16	05-10		No lab this week. Final lab report due at start of lecture on 5/11/2010
17			Final's week – no lab.