OSE 6455 Photonics Laboratory – Fall 2019

Pre-requisites: Graduate Standing, OSE 6349 Quantum Mechanics or PHY 5606 Physics Quantum Mechanics, OSE 6111 Optical Wave Propagation or PHY 5346 Electrodynamics I or OSE 6525 Laser Engineering

Time: Wednesday 1:30-4:20 PM
Room: CREOL 265
Instructor: Xiaoming Yu (CREOL A337)
TA: Mengdi Sun
Office Hour: By appointment

Goals:
1. Relate what you have learnt in classroom to what you can see in the lab of a variety topics related to photonics.
2. Take away the "fear factor" by providing experience of operating various equipment.
3. Establish good practices in experimentation including keeping a lab notebook and keeping the experiment station clean.
4. Learn to write lab reports of journal-manuscript quality/style.

Experiments:

1	LabView basics
2	Beam propagation in free space and in fiber
3	Polarization optics
4	Acousto-optic modulator (AOM)
5	Electro-optic modulator (EOM)
6	Liquid-crystal display (LCD)
7	Fiber sensor
8	Laser diode
9	Waveguide
10	LED and Gratings

Schedule (Regular):

Group	I	II	III	IV
8/27	Introduction			
9/3	LabView Basics	Beam Propagation	Polarization Optics	AOM
9/10	AOM	LabView basics	Beam Propagation	Polarization Optics
9/17	Polarization Optics	AOM	LabView Basics	Beam Propagation
9/24	Beam Propagation	Polarization Optics	AOM	LabView Basics
Group	I	II	III	IV
10/1	EOM	LCD	Fiber sensor	Laser diode
10/8	Laser diode	EOM	LCD	Fiber sensor
10/15	Fiber sensor	Laser diode	EOM	LCD
10/22	LCD	Fiber sensor	Laser diode	EOM
Group	I	II	III	IV
10/29	Waveguide	LED and Gratings	No Lab	No Lab
11/5	No Lab	Waveguide	LED and Gratings	No Lab
11/12	No Lab	No Lab	Waveguide	LED and Gratings
11/19	LED and Gratings	No Lab	No Lab	Waveguide
12/3	Full report due			

Grading Policy:

Attendance	20%
Pre-Lab Quizzes	10%
1 Full Lab Report	20%
10 Short Lab Reports	50%

A: >95
A-:90-94
B+: 85-89
B: 80-84

Reference Books:
- Fundamentals of Photonics by B. E. A. Saleh and M. C. Teich, Wiley, 1991
- Optical Electronics in Modern Communications by A. Yariv, Oxford, 5th Edition, 1997
- Optics, 5th edition, Hecht, 2017