

OSE 4470L Fiber-Optic Communications Laboratory

Instructor: Guifang Li, CREOL 278,
Phone 823-6811, E-mail: li@creol.ucf.edu

Time: Tuesdays 4:30pm – 6:30pm

Grader: Bin Huang

Office Hours: Fridays 9:00-12:00 CREOL 278 or by
appointment (no appointments on Tuesday)

Goals:

1. Relate what you have learnt in classroom to what you can see in the lab of a variety topics related to fiber-optic communications.
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.

Course Description

- **This lab course is associated with the theory course on the same topic (OSE 4470). The experiments are cover three topics:**
 - 1. The optical fiber as a transmission channel, for example**
 - **Coupling light into and between fibers**
 - **Measuring losses of fibers**
 - **Observing modes/dispersion of various types of optical fibers**
 - 2. Optoelectronic devices used in transmitters, receivers, and multiplexers (how to use them)**
 - 3. Fiber-optic communication systems performance**
 - **Setting up a digital or analog fiber-optic communication system and observe their**
 - **Components for wavelength-division multiplexing (WDM) and WDM systems.**

Learning Outcomes

Upon completing this course, students will become familiar with various fiber optic components and systems and know how to:

- Couple light in and out of fibers and connect them**
- Measure loss and dispersion in fibers**
- Measure the performance of analog and digital fiber links**
- Relate an integrated view of engineering by explaining the fundamental analogies between electrical and optical communication systems**

Preliminary Schedule

8/19	Introduction, Show & Tell
8/26	Numerical Aperture of a Fiber
9/9	Mode Profile of the Fundamental Mode
9/23	High-Order Modes in Fiber
10/7	Coupling loss and progress loss
10/21	Fiber Sensor
11/4	Analog Link
11/18	Digital Link
12/2	WDM

Instructional Materials

- **Lab Notes**
- **Lab Procedure**

Textbook

- **Optical Fiber Communications, 4th Edition G. Keiser, McGraw-Hill**

References:

- **Optical Fiber Communication Systems, W. Jones, HRW.**
- **Fundamentals of Photonics, B. Saleh and M. Teich, Wiley.**

Grading Policy

- **On-Time Attendance/Active Involvement:** **30%**
- **Lab Notebook:** **10%**
- **Quizzes:** **10%**
- **Lab Reports:** **50%**

House-Keeping Items

- **Lab notebooks will be examined periodically and collected at the end of the semester.**
- **Lab reports must be submitted through Webcourses at <http://webcourses.ucf.edu/> by 12:00 am of the next Tuesday after the experiment is completed.**
- **Lab reports sent via email or hard copy will NOT be accepted.**
- **Absences and Makeup Lab Sessions:**
 - **Because of the fluid nature of the lab with the experimental setup changing every week, there will be NO MAKEUPS ALLOWED except in cases of genuine emergency.**
 - **With prior arrangements, students may be allowed access to the lab after the class and before Thursday at 3:00 pm of the same week.**
- **As this is the first time this course is offered, we may have to change or modify any portion of the content or schedule for this class.**

Laboratory Notebook

- **A bound pre-numbered laboratory notebook must be used to properly document all experimental procedures, observations, data, and measurements during the laboratory session. All entries must be in ink. The notebook must be dated and signed by the lab instructor.**
- **Goal is to be able to**
 - **Reproduce the experimental setup (hardware)**
 - **Repeat the experiment by recording the details of the laboratory settings**
- **Notebook Organizations**
 - **Date, Partner(s)**
 - **Equipment List include model #**
 - **Schematic Drawing and Raw Data for each lab procedure**

Enjoy the Lab!