

Course Syllabus

OSE-4470L Fiber Optic Communication Laboratory, 1 CREDIT HOUR

Instructor: Guifang Li

Email: li@ucf.edu

Phone:

Office:

Office Hours:

Term: Fall 2017

Class Meeting Days: Wednesdays

Class Meeting Time: 1:30pm – 4:20pm (I)
1:30pm – 4:20pm (II)

Class Location: CREOL: A210

Website: webcourses@ucf

Additional Notes: Often, I get questions via e-mail that can be quickly answered, therefore email is the preferred mode of contact. However, for more elaborate discussions, I can arrange to meet at CREOL via appointment, preferably before or after the laboratory session.

Course Catalog Description:

Pre/Co-requisites: OSE 4470 Fiber-Optic Communications

Detailed Course Description and Learning Outcomes:

Detailed Description:

This lab course is associated with the theory course on the same topic (OSE 4470) on Introduction to the Principles of Optical Fiber Communication Systems.

1. This laboratory course will enable students to relate what they have learnt in classroom to practical, hands-on experiments that will be performed in a fiber optic communication laboratory.
2. Take away the “fear factor” by providing experience of operating various equipment.
3. Establish good practices in experimentation including accurate data collection, critical thinking, analysis of data, and sources of error.
4. Learn to write lab reports.

Learning Outcomes and Measures:

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 in fibers
- Measure the performance of analog and digital fiber links

Topics: (A detailed schedule with dates follows at the end of this document.)

The experiments are set up to cover three main topics:

1. The optical fiber as a transmission channel.

2. Optoelectronic devices used in transmitters, receivers, and multiplexers.
3. Overall communication system performance. The challenges of coupling light into and between fibers and the associated losses are experimentally quantified. The dispersion of various types of optical fibers is measured. The issues of digital and analog systems and their performances are introduced and quantified. Introductions to wavelength-division multiplexing (WDM) components and systems are also provided.

Relationship of Course to ABET Criteria

ABET Criteria	Level of Emphasis During Course (Low, Medium, High)
(a) An ability to apply knowledge of mathematics, science, and engineering.	High
(b) An ability to design and conduct experiments, as well as to analyze and interpret data.	High
(c) An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.	Low
(d) An ability to function on multidisciplinary teams.	Low
(e) An ability to identify, formulate, and solve engineering problems.	High
(f) An understanding of professional and ethical responsibility.	Low
(g) An ability to communicate effectively.	Medium
(h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.	Low
(i) A recognition of the need for, and an ability to engage in life-long learning.	Medium
(j) A knowledge of contemporary issues.	Low
(k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	High

Textbook:

Laboratory notes and instructions will be sufficient for most students. However students may find the following textbook useful: *Optical Fiber Communications*, 4th Edition G. Keiser, McGraw-Hill

Recommended Reference:

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

Course Grading and Requirements for Success:

Attendance & Participation: 8%

Shot Lab Reports: 42% (6% for each lab)

1 Full Lab Report: 20%

5 Quizzes: 30% (6% each)

Make up class policy: If an emergency arises and a student cannot submit assigned work on or before the scheduled due date or cannot show up for class, the student **must** give notification to the instructor **no less than 24 hours before** the scheduled date and **no more than 48 hours after**.

Grading Scale (%)	Rubric Description
100 ≥ A >	Excellent, has a strong understanding of all concepts and is able to apply the concepts in all and novel situations. Has full mastery of the content of the course.
> B ≥	Good, has a strong understanding of most or all of the concepts and is able to apply them to stated and defined situations.
> C ≥	Average, has a basic understanding of the major concepts of the course and is able to apply to basic situations.
> D ≥	Below average, has a basic understanding of only the simple concepts and is able to apply to only a limited number of the most basic situations.
> F ≥ 0	Demonstrates no understanding of the course content.

Grade Objections:

All objections to grades should be made **in writing within one week** of the work in question. Objections made after this period has elapsed will **not** be considered – NO EXCEPTIONS.

Class Website:

Materials used for classes will be available on UCF Webcourses for download before each class. If students want a hard copy of the slides, they may print them on their own. These are only printed for you for the first class. You are required to read or view materials prior to class. If you do not, you will not be able to do well in this class. See below.

Professionalism and Ethics:

Per university policy and classroom etiquette, mobile phones, etc. must be silenced during all classroom lectures, unless you are specifically asked to make use of such devices for certain activities. **Academic dishonesty in any form will not be tolerated.** If you are uncertain as to what constitutes academic dishonesty, please consult The Golden Rule in the UCF Student Handbook (www.goldenrule.sdes.ucf.edu) for further details. As in all University courses, The Golden Rule Rules of Conduct will be applied. Violations of these rules will result in a record of the infraction being placed in your file and the student receiving a zero on the work in question AT A MINIMUM. At the instructor's discretion, you may also receive a failing grade for the course. Confirmation of such incidents can also result in expulsion from the University.

Students with Special Testing/Learning Needs:

Students with special needs and require special accommodations must be registered with UCF Student Disability Services prior to receiving those accommodations. Students must have documented disabilities requiring the special accommodations and must meet with the instructor to discuss the special needs as early as possible in the first week of classes. UCF Student Disability Services can be contacted at www.sds.sdes.ucf.edu or at (407)823-2371.

OSE-4470 Fiber Optic Communication Laboratory, Instructor: Guifang Li
Daily Schedule (subject to change)

Week	Date	Lab Topic	Textbook chapter
1	Aug 23	Show and Tell	
2	Aug 30	Numerical Aperture of a Fiber - i	
3	Sep 6	Numerical Aperture of a Fiber - ii	
4	Sep 13	Mode Profile of the Fundamental Mode - i	
5	Sep 20 (ECOC)	Mode Profile of the Fundamental Mode - ii	
6	Sep 27	High-Order Modes in Fiber - i	
7	Oct 4	High-Order Modes in Fiber - ii	
8	Oct 11	Coupling and Propagation Loss - i	
9	Oct 18	Coupling and Propagation Loss - ii	
10	Oct 25	Analog Communication Link - i	
11	Nov 1	Analog Communication Link - ii	
12	Nov 8	Digital Communication Link - i	
13	Nov 15 (APC)	Digital Communication Link - ii	
14	Nov 22 (??)	Thanksgiving	
15	Nov 29	Wavelength Division Multiplexing - i	
15	Nov 29	Wavelength Division Multiplexing - ii	
16	Throughout the Week	FINAL EXAM	