



Course Syllabus

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

Instructor: Guifang Li	Term: Fall 2021
Email: li@ucf.edu	Class Meeting Days: Monday
Phone: (407) 823-6811	Class Meeting Time: 9:00am – 11:50am (I) 1:00pm – 3:50pm (II)
TAs: Alireza Fardoost & Sailing Zhang.....	Class Location: CREOL: A210
Office: 53-A239	Website: webcourses@ucf
Office Hours: Before/After class & Lab Off Weeks	

Additional Notes: Simple questions can be quickly answered via email. For more elaborate discussions, join Zoom sessions, or by appointment.

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 Fiber-Optic Communications.

1. This laboratory course will enable students to relate what they have learnt in classroom to experimental observations.
2. Take away the “fear factor” by providing experience of operating various equipment.
3. Establish good practices in experimentation including keeping records in a lab notebook, accurate data collection, critical thinking, analysis of data, and identifying 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
- Connect fibers
- Measure losses in fibers
- Measure the performance of analog and digital fiber links

Topics: (See detailed schedule with dates 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.
 - Losses associated with coupling light into or between fibers are experimentally measured.

- Performance metrics for analog and digital communication will be introduced and quantified. A wavelength-division multiplexing (WDM) system will be built and qualitatively tested.

Textbook:

Laboratory notes and instructions, in conjunction with the required textbook for the lecture class (OSE 4470) will be sufficient for most students.

However, you may find the following reference textbooks useful:

- *Optical Fiber Communications*, 4th Edition G. Keiser, McGraw-Hill
- *Optical Fiber Communication Systems*, W. Jones, HRW.
- *Fundamentals of Photonics*, B. Saleh and M. Teich, Wiley.

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

Course Grading and Requirements for Success:

- Attendance & Participation: 8%**
- Shot Lab Reports: 42%** (6% for each lab)
- 1 Full Lab Report: 14%**
- 4 Quizzes: 24%** (6% each)
- Lab Notebook: 6%**
- Lab Skills Test: 6%**

Make up class policy: If an emergency arises and a student cannot 1) show up for class or 2) submit assigned work on time, the student **must** give notification to the instructor **no less than 24 hours before** the scheduled lab, or **no more than 48 hours after due date, respectively.**

Grading Scale (%)	Rubric Description
100 ≥ A > 90	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.
90 > B ≥ 80	Good, has a strong understanding of most or all of the concepts and is able to apply them to stated and defined situations.
70 > C ≥ 79	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 will **not** be considered – NO EXCEPTIONS.

Class Website:

Materials used for classes will be available on UCF Webcourses for download before each class.

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: Tentative Weekly Schedule			
Week	Date	Lab Topic	Note
1	Aug 23	Fiber Cleaving + Numerical Aperture of a Fiber-i	Lab
2	Aug 30	Numerical Aperture of a Fiber -ii	Report
3	Sep 13	Coupling into Fiber + Profile of the Fundamental Mode - i	Lab
4	Sep 20	Profile of the Fundamental Mode - ii	Report
5	Sep 27	High-Order Modes in Fiber – One week only	Lab+Report
6	Oct 4	Coupling and Propagation Loss - i	Lab
7	Oct 11	Coupling and Propagation Loss - ii	Report
8	Oct 18	Analog Communication Link - i	Lab
9	Oct 25	Analog Communication Link – ii	Report
10	Nov 1	Digital Communication Link - i	Lab
11	Nov 8	Digital Communication Link - ii	Long Report
12	Nov 15	Wavelength Division Multiplexing - i	Lab
13	Nov 22	Wavelength Division Multiplexing - ii	Report
14	Week of Nov 29	Lab Skills Test + Writing Long Lab Report	
15	Week of Dec 6	FINAL EXAM Period, Long Lab Report Due	